



ANNUAL REPORT 2012



CENTER FOR MASSIVE DATA ALGORITHMICS

2012 Highlights

Research team

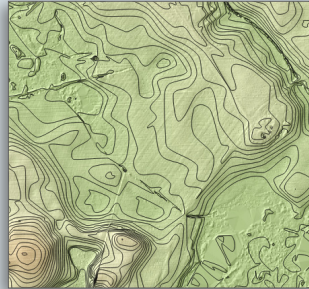
At the end of 2012 the center research team consisted of eight senior researchers (4 at AU), nine Postdocs (7 at AU) and seventeen PhD students (9 at AU). Additionally, three further Postdocs and four PhD students (all of which obtained PhD degrees during the year) were part of the center in 2012. All center Postdocs are internationals and so are a good deal of the PhD students.



Research collaboration and results

In 2012 MADALGO researchers published 88 peer reviewed research papers within the center research areas. Several of these papers have appeared in highly ranked journals and conference proceedings. Some of the results in the papers have been obtained with the many international researchers that have visited MADALGO in 2012. The center also has extensive multidisciplinary and industry collaboration.

Producing both accurate and aesthetic *contour maps* from detailed terrain models is a challenging task. In 2012 MADALGO researchers developed and implemented algorithms that are able to process even extremely large and detailed terrain models to produce aesthetic contour maps with a user-specified x-, y-, and z-accuracy.



Center events



Apart from a large number of smaller research seminars and workshops, as well as a retreat for center employees, MADALGO organized a four day international summer school on Algorithms for Modern Parallel and Distributed Models in 2012, where four international experts lectured for 60 participants (mostly PhD students) from 40 institutions in 17 countries.

The center also organized the Fourth Workshop on Massive Data Algorithmics (MASSIVE 2012) as part of the main European algorithms event ALGO in Ljubljana, Slovenia. In previous years the workshop was colocated with Symposium on Computational Geometry.

In 2012 center researchers gave numerous presentations at international research conferences, as well as more than 45 invited presentations at research conferences, workshops and seminars.

Center researchers have also participated in several public outreach activities, including in the annual Festival of Research where the center booth attracted many interested visitors (including the Minister for Science, Innovation and Higher Education).



Awards and acknowledgments



Center researchers received a number of awards and acknowledgments in 2012 including the following:

Center Director Arge was elected Fellow of the Association of Computing Machinery (ACM) and Brodal received the first Best Lecturer Award given by the Department of Computer Science at Aarhus University. Work by Indyk and collaborators was selected as one of ten emerging technologies by Technology Review.

Center PhD student Larsen won the best paper award *and* the best student paper award (the Danny Lewin award) at the top theoretical computer science conference ACM Symposium on Theory of Computing.

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This report describes the 2012 activities at the Danish National Research Foundation's *Center for Massive Data Algorithmics* (MADALGO). The report is accompanied by a number of appendices (covering external relations, conferences, educational activities, external funding, awards, public outreach, patents and applications, publications, list of personnel) as specified by the foundation. The appendices are an important part of the annual report (and information such as external funding and teaching is only covered in the appendices). Note that *some* of the appendices only cover the employees at Aarhus University (and not the participants at Max Planck Institute for Informatics, Massachusetts Institute of Technology and Frankfurt University). Finally, note that the 2012 accounts for the center with appendices (as well as the center research plan and previous yearly reports) are also important in order to obtain a complete overview of the 2012 activities of the center.

Center director statement

By signing I confirm that this annual report and the accounts therein, including notes and summaries, contain all relevant information relating to this year's main activities in the Danish National Research Foundation's Center for Massive Data Algorithmics.

March 2013



Lars Arge
Center Director

1 Center background and organization

Center for Massive Data Algorithmics (MADALGO) strives to be a world-leading center in algorithms for handling massive data. The center particularly focuses on designing algorithms in theoretical models that take the hierarchical memory organization of modern machines into account. The center builds on the research strength at the main center site at Aarhus University (AU) in Denmark (with Brodal, Arge, Jensen and Afshani as senior faculty), at the center sites at the Max Planck Institute for Informatics (MPI) and at Frankfurt University (FRA) in Germany (with Mehlhorn and Meyer as senior faculty), and at Massachusetts Institute of Technology (MIT) in the US (with Demaine and Indyk as senior faculty). The center also relies on significant international research collaboration, multidisciplinary and industry collaboration, and on maintaining a vibrant international environment at the main center site.

Organizationally, the center has seen some changes in 2012 as it went into its second 5 year period, with addition of AU faculty Professor Christian S. Jensen and Assistant Professor Peyman Afshani. Jensen adds a database component to the center and Afshani (who is hired in a “tenure-track” position) adds additional expertise in computational geometry, data structures and lower bounds. Scientifically, the center continues to be led by center director Lars Arge along with the other senior faculty and with advice from the center’s international advisory board. Logistically, the main center site continues to be managed by center manager Else Magård and accountant Ellen Lindstrøm, along with student assistant Matie Bach Sjøgaard and additional secretarial support from the Department of Computer Science. A part time student programmer has also been associated with the center in 2012. On the research personnel side, the center Post Doc and PhD student population has developed more or less as anticipated (refer to section 5).

2 Center research

The second period center research plan discusses a number of research challenges in the center focus research areas of *I/O-efficient*, *cache-oblivious* and *streaming* algorithms and in *algorithm engineering*, as well as challenges in a number of *other and crosscutting* areas. Overall, 2012 was a record year in terms of research results (with no less than 16 publications in the top conferences Symposium on Theory of Computing, Symposium on the Foundation of Computer Science, and Symposium on Discrete Algorithms). Below we *briefly* discuss *some* of the obtained results. We currently see no need to modify the research plan.

I/O-efficient algorithms

In the area of *I/O-efficient* algorithms, that is, algorithms designed in a two-level memory-disk model, we have made good progress on a number of problems in relation to the areas outlined in the research plan.

In terms of *fundamental algorithmic problems*, we have shown a general equivalence between sorting and priority queues in the *I/O*-model (similar to an equivalence in internal memory models). A paper with this result is under submission. As also discussed in last year’s report, we have also obtained results on so-called fully persistent search-tree structures [C213].

In terms of *geometric data structures*, we have e.g. continued our study of range searching variants, more precisely the problem of storing a set of d -dimensional points such that properties of the subset of points that lie inside a query range can be found efficiently. We have made progress on both building better data structures (upper bounds) and on proving impossibility results (lower bounds). In the first areas we have for example considered two-dimensional skyline queries, where given a rectangular query range the objective is to report the skyline of the points that lie inside the range. In a paper recently accepted for the 2013 Symposium on Principles of Databases, we describe efficient and dynamic data structures for this problem. In the second area, we have e.g. improved the previous best known lower bound (both in the *I/O*- and pointer machine models) for the problem of reporting all the points that lie inside a query simplex [C230]. We have also considered a number of problems where the goal is to report a sorted order of points that is given implicitly at query time. An example includes storing a set of points in the plane such that we can compute the angular ordering of the points around a given query point efficiently [C229].

In the area of *terrain data processing* we have considered the problem of generating multi-resolution instances of a raster, e.g. representing a terrain, that is, of generating a series of successively more simplified (and smaller) versions of the raster. We developed space and *I/O*-efficient algorithms for this problem, which e.g. has important applications in biology (biodiversity) [C228]. As mentioned in last year’s report, we have also developed *I/O*-efficient algorithms for extracting and significantly simplifying contour line maps from massive terrain models, while e.g. guaranteeing that the contour lines in the simplified map are provably close to, and nested as, the original contours [C203].

We have also continued to work on *I/O*-efficient *graph algorithms* and e.g. extended our earlier results on classic shortest-path computations on general undirected graphs with either random or bounded edge weights

[J70]. We have also devised an improved randomized algorithm for approximating the diameter of a graph [C237]. The algorithm can be viewed as a hierarchical version of one of our previous algorithms [C27]. The problem e.g. is relevant in connection with social network analysis, and (as also discussed in last year's report) we have also obtained I/O-efficient algorithms for another key problem in social network analysis, namely for computing the so-called betweenness centrality of each node in a network [C196].

Cache-oblivious algorithms

In the cache-oblivious algorithms area the aim is to develop algorithms that automatically adapt to the unknown multiple levels of modern memory hierarchies. Unfortunately, techniques to obtain cache-oblivious algorithms are still not very developed and the fundamental limitations in the area not well understood.

In 2012 we have continued to try to understand fundamental limitations by considering fundamental data structure problems, such as the search-tree (dictionary) problem. As mentioned in last year's report, we have e.g. developed a structure that in addition to being cache-oblivious also is implicit (i.e. uses no space in addition to the space used to store the data elements), while also supporting predecessor queries within the so-called working-set bound (that is, queries to recently accessed elements is faster than queries to not so recently accessed elements) [C210]. Overall, we have not made as much progress in the cache-oblivious area as we would have liked, but on the other hand our focus on cache-oblivious algorithms is beginning to influence our work in related areas. For example, following the development of the I/O-efficient algorithm for generating multi-resolution instances of a raster described above, which is not cache-oblivious, we recently developed an improved and elegant cache-oblivious (and thus also I/O-efficient) algorithm for the problem. From a theoretical point of view, the algorithm is also interesting because its analysis relies heavily on a central (prime number) result from number theory. A paper with the result is under submission. Several of our algorithms for betweenness centrality discussed above are also cache-oblivious [C196].

Streaming algorithms

Streaming algorithms are algorithms designed in a model where only one (or a small constant number of) sequential pass(es) over the data is (are) allowed. In 2012 we have continued our work on fundamental streaming problems and general streaming algorithm design techniques as outlined in the research plan.

In terms of *fundamental problems*, we have e.g. developed new algorithms for counting sub-graphs in stream graphs [C238] and for computing Parikh matchings [C233]. We have also proved particularly simple lower bounds on the space complexity of estimating frequency moments [C243]. In terms of *design techniques*, we have e.g. continued our study of *sketching*, where the goal is to compute a small so-called sketch Ax of a vector x using an appropriately designed sketching matrix A , such that given only the sketch one can still compute the desired property of x . The vector x could for example be a representation of a data stream. We have designed sketches that preserve the so-called Earth-Mover-Distance norm of the input vector (a measure frequently used in computer vision) [C207], and presented a new construction of sketches that preserve the Euclidean distance [C226]. Unlike prior work, our sketches use sparse matrices A , which significantly reduces the sketching computation cost. We have also presented more efficient sketching algorithms that preserve the edit distance between two strings [C232]. Furthermore, we have investigated the *recovery of a sparse approximation* to x , that is, given Ax , reconstructing an approximation that has as few non-zero coefficients as possible while being as close to x as possible with respect to some metric. We have designed several new sketches for sparse recovery problems that use particularly simple sketching matrices A that are amenable to hardware implementations [C244, J76]. In a paper that recently appeared at Symposium on Discrete Algorithms, we have also showed lower bounds for sparse recovery that hold even for adaptive sketches.

Using the insight we have obtained during our work on streaming, we have also designed several highly efficient algorithms for the *Discrete Fourier Transform* (DFT). DFT is a foundational tool used in numerous applications and currently the fastest DFT algorithm is the so-called Fast Fourier Transform (FFT). We have designed a new algorithm for the sparse DFT that is much faster than the previously known methods [C220, C221]. In fact, in some cases our new algorithm is optimal in the sense that it cannot be improved unless FFT itself can be improved upon.

Algorithm engineering

Algorithm engineering covers the design and analysis of practical algorithms, their efficient implementation, as well as experimentation that provides insight into their applicability. In 2012 we have made progress in most of the algorithm engineering areas discussed in the research plan, as well as in a few others.

In terms of *library development*, we have continued our work on pipelining and multicore support in the TPIE library for implementation of I/O-efficient algorithms. We have also continued our work on

engineering I/O-efficient *graphs algorithms*, and e.g. for diameter approximation experimented with an implementation [C216] of a simple randomized approach [C27], as well as with a more involved hierarchical variant [C237] (also discussed in the I/O-efficient algorithms section above). We have also developed improved heuristics for the analysis of the cycle structure in huge outdegree-one graphs with applications in data encryption [C217]. In terms of *terrain data processing*, we have for example experimented with both the contour map I/O-efficient simplification algorithm [C203] and I/O-efficient and cache-oblivious algorithms for generating multi-resolution instances of a raster [C228] described above. In both cases we got very encouraging results. The contour algorithm is for example capable of reducing the size of ½-meter contours generated from a 26 billion data element terrain model of Denmark with over 90% (from 4 billion to 400 million elements) while ensuring a 20cm height accuracy. In the multi-resolution case it, very interestingly, turned out that the cache-oblivious algorithm outperformed the I/O-efficient algorithm on massive terrain inputs.

As discussed in previous annual reports, much of our previous engineering work on massive terrain data processing is being commercialized through the startup company SCALGO. During 2012 SCALGO released several new and improved software packages, and e.g. delivered a depression flood risk mapping (the so-called Skybrudskort[®] product) to one of the five regions (Midtjylland) in Denmark. Our massive terrain data algorithms engineering work (including the SCALGO software) is also at the core of our expanding multidisciplinary collaboration with *biodiversity* researchers (described further in Section 3). In 2012 the collaboration for example led to results on land cover classification using LiDAR terrain scanning, on understory light condition estimation using LiDAR scanning, and on the influence of topology on diversity. Journal papers with these results will appear in 2013. The collaboration also inspired the work on multi-resolution raster generation discussed above, since the problem has important applications in biodiversity studies. Thus this work nicely bridges all the way from multidisciplinary collaboration (application), through theoretical work within new computational models (I/O-efficient and cache-oblivious algorithms), to algorithm engineering (implementation and experimentation).

The close collaboration with biodiversity researchers also let to non-terrain results, such as a result on efficient computation of so-called phylogenetic tree measures [C227]. In other collaboration with bioinformatics researchers, we have also obtained results on practical efficient algorithms for computing a certain important measure of distance between binary trees. This work will appear in the Asia Pacific Bioinformatics conference this year. Interestingly, this algorithm engineering work subsequently resulted in theoretical results presented in this year's Symposium on Discrete Algorithms. Finally, we have also done experiments on our new DFT algorithm (inspired by our streaming algorithm work), and shown that in some parameter ranges the algorithm performs better in practice than FFT. In fact, our new algorithm has already been used for GPS locking problems [C242].

Other/crosscutting areas

We have continued our work in several new massive dataset areas as discussed in the research plan.

In the area of *succinct data structures*, that is, data structures that are very space-efficient, we previously studied the problem of designing space efficient data structures for supporting range minimum queries on a two-dimensional matrix [J66]. In recent work we developed new data structures with improved query bounds [C215]. As discussed in last year's report, we have also considered (cache-oblivious) range minimum data structures in the very restrictive implicit succinct model [209]. For the special case where the input is a one-dimensional matrix, range minimum queries can be answered by constructing a Cartesian tree over the input. In 2012 we have developed efficient representations of binary trees that can be used to store Cartesian trees, allowing one dimensional queries to be answered in constant time and using optimal space [C212].

Unlike in the succinct data structures area, we did not make much progress on developing theoretical models and algorithms for *flash memory* or on *faulty-memory algorithms* in 2012. However, much of the center work described above is on data structures, and we have continued to obtain significant results on data structure problems in more classical models of computation. In particular, we have obtained numerous results on data structures for various range searching variants [C195,C198,C31] and we also presented several results on such structures at the recent Symposium on Discrete Algorithms, just as we have obtained considerable progress on lower bounds for such structures [C199,C200,C201,C202]. As mentioned in last year's report, one of the papers presenting these results received the best paper and best student paper awards at the top theoretical computer science conference Symposium on Theory of Computing in 2012 [C199]. As also mentioned in last year's report, at the conference we also presented results on a longstanding classical and fundamental open problem in comparison based (pointer machine model) meldable priority queues [C214].

We have considered massive data problems in several parallel and distributed models of computation. In the *parallel private-cache* model, which models modern multi-core processors, we have extended the ubiquitous

buffer tree data structure for I/O-efficiently performing batched searches and updates to exploit multiple cores [C236]. We have also introduced, and performed an empirical study of, a multi-core algorithm for keeping track of massive amounts of moving objects under rectangular range queries and a large number of updates [C256]. In a recent paper to be presented at Symposium on Parallelism in Algorithms and Architectures, we have also developed several provably efficient algorithms for models of modern (massively parallel) graphics processing units (*GPUs*). We have also continued the work started last year on *distributed streaming* models, where a number of processors each receive a stream of data, and the task is to maintain an approximation of a given function of the union of all streams using a minimal amount of communication. We have e.g. achieved new and improved algorithms and lower bounds for estimating the number of distinct elements and for identifying heavy hitters [C204, 205]. We have also designed algorithms for sliding window problems [J68], and showed lower bounds for multiparty sketching problems [C206]. Much of the work on data structures, multi-core, GPU and distributed streaming above, as well as much of the algorithm engineering work (including the work with biology researchers), are examples of the “crosscutting” work we have done in 2012, that is, work that involves ideas from or spans several areas or combines the various models/methodologies we consider. Additionally, we have e.g. also obtained several results on algorithms that are both I/O-efficient and efficient in internal memory (the RAM model). After adding a database component to the center, we have also obtained a large number of results on spatial database problems in general (e.g. [C228,C240,C254,C259]) and problems on moving objects (e.g. [C252,C253,C255, C256,C257]) in particular. However, we have not had as much synergy between the algorithms and spatial database groups in the center as we would have liked. We hope this will change with the hiring of database Post Doc Sidlauskas with the special task of bridging the gap between the two groups; Sidlauskas has e.g. worked on the multi-core algorithms for moving objects mentioned above [C256].

3 Collaboration

The center continues to try to maintain a vibrant and international environment at the main center site at AU, e.g. through emphasis on hosting international visitors. Almost all senior MIT, MPI and FRA faculty have visited AU during 2012, and all FRA and many MIT PhD-students and Post Docs have also visited. Additionally, non-center Post Doc Djamel Belazzougui (Paris Diderot), along with students Stijn Koopal (TU Eindhoven) and Libor Sarga (Tomas Bata University), visited AU for a longer period of time in 2012, and several faculty members are expressing interest in longer term sabbatical visits in 2013-2014. The list of shorter term non-center researchers visiting AU include Rolf Fagerberg (Southern Denmark), Nodari Sitchinava (Karlsruhe), Stephen Alstrup (Copenhagen), Thomas Mølhave (Duke), Srinivasa Rao Satti (Seoul National), Jeff Phillips (Utah), Sergei Vassilivitskii (Google), Graham Cormode (AT&T), Suresh Venkatasubramanian (Utah), Boris Aronov (NYU Poly), Ian Munro (Waterloo), Andrej Brodnik (Primorska), and Mark de Berg (TU Eindhoven). The center also continues to have a strong collaboration (e.g. through joint events and Post Docs) with Sino-Danish Center for the Theory of Interactive Computation (CTIC).

As can be seen in Appendix A, the center continues to collaborate extensively with researchers from a large number of institutions. The center also continues to try to be a catalyst of multidisciplinary and industry collaboration. Many of the center’s activities in this direction are in connection with massive terrain data, where center researchers e.g. collaborate intensively with ecoinformatics researchers at the Department of Bioscience, researchers at Duke in the US and at Primorska in Slovenia, as well as with industry partners COWI, EIVA and center startup SCALGO. Much of the collaboration with ecoinformatics researchers is in the context of *Center for Interdisciplinary Geospatial Informatics Research* (CiGIR). Using a seed grant from Aarhus University Research Foundation, as well as other external funding (e.g. Arge’s EliteForsk award), CiGIR currently has one biology based Post Doc (Alexander) and one center based Post Doc (Tsirogiannis); One previous CiGIR Post Doc (Sandel) is now a Biology Assistant Professor associated with CiGIR. The CiGIR staff spends at least one day a week at the other site than their base. Other center multidisciplinary collaborations include various projects with researchers at the AU Bioinformatics Research Center (BiRC), and a project with the State Library in Aarhus (joint advising of PhD student Sindahl). The center is also exploring collaborations in connection with the truly massive data that will be generated by the future FAIR and ESS physics experiments, and is collaborating with Draper Labs on compressive sensing for astronomical imaging and with FlexDanmark and Delphi on GPS data management. Other industry collaborations include a project with Lufthansa Systems concerning flight route optimization, and the center (Arge) recently obtained funding from the Danish High-Tech Foundation (“Højteknologifonden”) for an industrial Post Doc project on flight data management with DSE Airport Solutions.

4 Events

During 2012 the center participated in and/or organized a large number of research events. These included internal weekly seminars at AU and a retreat for center employees. Externally, center researchers gave numerous presentations at international research conferences, as well as more than 45 invited presentations at research conferences, workshops and seminars. Center researchers have also participated in several public outreach activities. Brodal has for example lectured on algorithms for both primary and high school students, and along with biodiversity collaborators the center had a booth at the annual Danish Research Day (“Forskningens døgn”) that attracted many interested visitors (including the minister of education). Center PhD students also coached two AU student programming competition teams, one of which won the Danish Championship and thus went on to participate in the European competition.

Following previous year’s successes, the center organized a fourth *Workshop on Massive Data Algorithmics* (MASSIVE) in 2012. Building on the three first MASSIVE workshops, the center decided to co-locate the fourth workshop with the broad European algorithms conference ALGO rather than with the narrower *Symposium on Computational Geometry* as in previous years. Despite the move in time and venue the workshop was a success. The plan is also to co-locate the fifth MASSIVE with ALGO 2013. The hope is to eventually make MASSIVE a full-fledged conference. The center also continued its series of summer schools and organized a school on *Algorithms for Modern Parallel and Distributed Models* in 2012, where four international experts lectured for around 60 participants from 40 different institutions in 17 countries. The school was a great success and attracted students from both the algorithms and database community. The center anticipates organizing yet another summer school in 2013. Finally, center staff was involved in the organization of a number of other international events, including a FOCS workshop on data structures, a workshop on sparse Fourier transform and a Dagstuhl seminar.

5 Research education

One key goal of the center is to train the next generation of researchers in a world-leading and international environment. Thus PhD-students and Post Docs are a very important part of the center, and the center strives to have a large population of international PhD students and Post Docs at AU.

Currently, the center houses 8 Post Docs (7 at AU, all internationals). Three of these were hired in 2012 (at AU): Hossein Jowhari (PhD Simon Fraser 2012) mainly working on streaming algorithms, Zhewei Wei (PhD HKUST 2012) working on I/O-efficient, cache-oblivious and streaming algorithms, and Darius Sidlauskas (PhD Aalborg 2012) working on problems on the boundary between algorithms and spatial databases. Furthermore, one Post Docs, Allan G. Jørgensen (PhD Aarhus 2010) was recently hired to work on the project with DSE Airport Solutions. Five Post Docs left the center in 2012. At AU, Lap-Kei Lee left after one year to become a Post Doc at Hong Kong University, and Qin Zhang and Elad Verbin left after two years to take up a faculty position at University of Indiana and an additional Post Doc, respectively. At MIT, Simak Tazari left for Google and Christian Sommer left for Apple at the end of 2011 and 2012, respectively.

Currently, the center houses 18 PhD students (10 at AU, 4 internationals). Five of these PhD students joined the center in 2012 and one in 2013. At AU, Jungwoo Yang (with Arge as advisor), Bryan Wilkinson (with Arge and Afshani as advisors) and Sarfraz Raza (with Arge as advisor), at MIT, Ludwig Schmidt and Haitham Hassanieh (with Indyk as advisor), and at FRA, David Veith (with Meyer as advisor). Furthermore, Jakob Truelsen returned from a two year leave (at SCALGO) to finish the two last years of his PhD study (at AU). Four PhD students obtained their degrees in 2012. At AU, Lasse Deleuran (with Arge as advisor), Freek van Walderveen (with Arge as advisor), Jesper Moeslund (with Arge as co-advisor), and at MIT, Khan Do Ba (with Indyk as advisor). Deleuran, van Walderveen and Do Ba went to industry, namely to Cryptomatic, SCALGO and Hudson River Trading, respectively. Biology PhD Moeslund went on to work at Danish Centre for Environment and Energy (DCE). Furthermore, after several years on leave with Octoshape, Mark Greve unfortunately decided to terminate his PhD study without obtaining a degree. During 2012 AU PhD students Casper Kejlberg-Rasmussen and Kasper G. Larsen spent approximately a semester abroad at Thessaloniki University and Princeton University, respectively.

As discussed in previous annual reports, we believe the center’s Post Doc and PhD student recruitment efforts have been relatively successful. For example, all Post Docs and almost half of the current AU PhD students are recruited internationally. The center’s focus on research education includes exchange of Post Doc and PhD students, a 6 months stay abroad for AU PhD students, and organization of summer schools and workshops. Center Post Docs also continue to organize specialized PhD classes, although less in 2012 than in previous years. Finally, the center continues to emphasize initiatives designed to create a sense of community at the main center site and among the center sites. This includes a yearly fall retreat, monthly center lunches at AU, and a number of social events.

EXTERNAL RELATIONS

SECTION A

List **includes** relevant collaboration for AU as well as MIT, MPI and FRA researchers in 2012

| Collaborator Name (person and/or institution), Country | Collaboration subject | Output of collaboration | Collaboration with: (Please check the appropriate box) | | | |
|--|--|---------------------------|--|--|------------------|-------------------|
| | | | Danish universities, research groups and institutions | Foreign universities, research groups and institutions | Danish companies | Foreign companies |
| Peder Klith Bøcher, Jens-Christian Svenning and Bettina Nygaard (Biosciences, AU), Tommy Dalgaard (Agroecology, AU), Denmark | Collaborators and co-advisors of PhD student Jesper Erenskjold Moeslund | Publications | X | | | |
| Norbert Zeh (Dalhausie), Canada | I/O-efficient algorithms and range searching data structures | Publications | | X | | |
| Ke Yi (HKUST), Hong Kong | I/O efficient data structures, streaming algorithms, distributed computation | Publications | | X | | |
| Lu Wang (HKUST), Hong Kong | I/O efficient data structures | Publications | | X | | |
| Graham Cormode (AT&T Lab), USA and Zengfeng Huang (HKUST), Hong Kong | Distributed computation | Publications | | X | | |
| Kristian Trøjelsgaard Nielsen and Jens Mogens Olesen (Aarhus University), Denmark | Biological interaction networks | Publications and software | X | | | |
| Brian Enquist (University of Arizona), USA | Phylogenetic diversity patterns | Publications and software | | X | | |
| Martin Olsen (Aarhus University, Herning), Denmark | Alliances in graphs | Publication | X | | | |
| Martijn van Leusen (Groningen), The Netherlands | Geomorphicetric Algorithms for Archaeological Applications | | | X | | |

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|--|---|--|---|---|---|--|
| Dimitris Cheliotis (Athens), Greece | Phylogenetic tree algorithms | Publication and Software | | X | | |
| Christos Tsirogiannis (Cambridge), UK | Social network analysis algorithms | | | X | | |
| Stephane Durocher and Jason Morrison (Manitoba), Canada, Manindra Agrawal (IIT), India | Data structures | Publication | | X | | |
| Anna Lubiw (University of Waterloo), Canada | Morphing planar graphs | publication | | X | | |
| BNR A/S | GIS in traffic management | | | | X | |
| COWI A/S (incl. Johnny Koust Rasmussen and Jeppe Sikker Jensen), Denmark | Efficient Handling of Massive Terrain Data | Terrain processing algorithms and software | X | | X | |
| Jan Vahrenhold (TU Dortmund), Germany and Andrew Danner (Swarthmore College), USA | TPIE | TPIE software package | | X | | |
| Eiva A/S, Denmark | Sonar data cleaning | Software | | | X | |
| Scalable Algorithmics (SCALGO), Denmark | I/O-efficient terrain algorithms and software | | | | X | |
| Mike Goodrich (UC Irvine), USA | I/O-efficient algorithms | Publication | | X | | |
| Pankaj K. Agarwal, Duke University, USA | Data structures, distributed and I/O-efficient terrain algorithms | Publications | | X | | |
| Timothy M. Chan (Waterloo), Canada | Data structures | Publications | | X | | |
| Rasmus Pagh (ITU), Denmark | Colored Range Searching | Publication | X | | | |
| Huy L. Nguyen (Princeton), US | Range Searching Lower Bounds | Publication | | X | | |
| Michiel Smid (Carleton), Canada | Range diameter reporting | Publication | | X | | |

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|--|--|---------------------------|--|---|--|---|
| Jeff M. Phillips (Utah), USA | Approximate and distributed algorithms and data structures | Publications | | X | | |
| Herman Haverkort, Mark de Berg and Stijn Koopal (TU Eindhoven), The Netherlands | Terrain algorithms | Publications | | X | | |
| Mohammad Ali Abam (TU Dortmund), Germany, Shervin Daneshpajouh, Mohammad Ghodsi (Sharif), Iran | Line simplification | Publications | | X | | |
| Thomas Mølhave (Duke), USA | I/O-efficient terrain algorithms and software | Publications and software | | X | | |
| Mikkel Thorup (AT&T), USA | I/O-efficient RAM algorithms | Publication | | | | X |
| Riko Jacob (ETH), Switzerland | Convex hull | Publication | | X | | |
| Andy Brodchnik (University of Primorska & University of Ljubljana), Slovenia | Data structures, terrain processing | Publication, project | | X | | |
| David P. Woodruff (IBM Research), USA | Distributed functional monitoring | Publication | | X | | |
| Zengfeng Huang and Ke Yi (Hong Kong University of Science and Technology), China | Distributed tracking | Publication | | X | | |
| Moshe Lewenstein (Bar-Ilan University), Israel | Streaming Parikh matching | Publication | | X | | |
| Sze-Hang Chan, Ho-Leung Chan, Tak-Wah Lam, and Jianqiao Zhu (HKU), Hong Kong | Scheduling | Publication | | X | | |
| Bolette Ammitzbøll Jurik (The State and University Library), Denmark | Audio Quality Assurance | Publication | | X | | |

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|---|--|-------------|--|---|--|--|
| Djamel Belazzougui (University of Helsinki), Finland | RAM sorting | Manuscript | | X | | |
| Kostas Tsichlas (Aristotle University of Thessaloniki), Greece, Kostas Tsakalidis (HKUST), Hong Kong, Yufei Tao (Chinese University of Hong Kong), Hong Kong and Jeonghun Yoon (KAIST), South Korea | IO-Efficient Range Skyline Queries | Manuscript | | X | | |
| Moshe Lewenstein, (Bar Ilan University), Israel, John Iacono (Polytechnic Institute of New York University), USA | Dynamic Connectivity, 3SUM, The Multiphase problem | Manuscript | | X | | |
| Christian Konrad (LIAFA, Université Paris Diderot), France | Error-Correcting under Earth-Mover Distance | Publication | | X | | |
| Xiaoming Sun and Chengu Wang (Tsinghua), China | Inner Product and Counting Cycles relationship | Publication | | X | | |
| S. Srinivasa Rao (Seoul National University), South Korea | Succinct data structures | Publication | | X | | |
| Rajeev Raman, (University of Leicester), UK and Moshe Lewenstein (Bar Ilan University), Israel | Data structures, succinct representations of trees | Publication | | X | | |
| Michel Smid (Carleton), Canada | Range Diameter data structures | Publication | | X | | |

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|---|--|---------------------------|--|---|--|---|
| George Lagogiannis (Athens), Greece and Robert E. Tarjan (Princeton & HP), USA | Data Structures | Publication | | X | | X |
| Kostas Tsihlias (Thessaloniki) and Spyros Sioutas (Ionian), Greece | I/O-efficient Persistence | Publication | | X | | |
| Rolf Fagerberg (University of Southern Denmark), Christian Nørgaard Storm Pedersen, Thomas Mailund, and Andreas Sand (Aarhus University), Denmark | Evolutionary tree comparison | Publication | | X | | |
| Djamal Belazzougui (University of Helsinki), Finland | Communication Complexity, Edit Distance | Publication | | X | | |
| Graham Cormode (AT&T Labs-Research), USA | Streaming Algorithms | Publication | | X | | |
| Funda Ergun (Simon Fraser University), USA | Streaming Algorithms | Publication | | X | | |
| Nodari Sitchinava (Karlsruhe Institute of Technology), Germany | GPU and I/O-efficient algorithms | Publications | | X | | |
| Man Lung Yiu and Jeppe Rishede (Hong Kong Polytechnic University), China | Spatial keyword querying, directions query caching | Publications and software | | X | | |

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|---|--|---------------------------|---|---|---|---|
| Gao Cong, Xin Cao, Lisi Chen (Nanyang Technological University), Singapore, Dingming Wu (Hong Kong Baptist University), China, Bin Cui (Peking University), China | Spatial keyword querying, question retrieval | Publications and software | | X | | |
| Xiaohui Li, Kian-Lee Tan, Beng Chin Ooi (National University of Singapore), Singapore | Spatial keyword querying, trajectory data management | Publications and software | | X | | |
| Kostas Tzoumas (FU Berlin), Germany, Amol Deshpande (University of Maryland), USA | Query optimization | Publications and software | | X | | |
| Panos Kalnis and Ruogu Ding (KAUST), Saudi Arabia | Outsourced similarity search, trajectory data management | Publication and software | | X | | |
| Xiaofang Zhou, Ke Deng and Kai Zheng (University of Queensland), Australia | Trajectory data management | Publication and software | | X | | |
| Panos Karras (Rutgers), USA | Scalable continuous query processing | Publications and software | | X | | |
| FlexDanmark, Denmark and Delphi, Germany/USA | GPS data management | Publications and software | | | X | X |
| Kristian Torp, Hua Lu and Ove Christensen (Aalborg University), Denmark | GPS data management, optimization, indoor query processing, indoor positioning | Publications and software | X | | | |
| Gustavo Alonso (ETH), Switzerland, Dieter Pfoser and Timos Sellis (NTUA), Greece | User-generated geo-content | Project collaboration | | X | | |

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|---|---|---|--|---|--|---|
| German Algorithm Engineering Cluster, Germany | Selected Topics in Alg. Engineering | Workshops | | X | | |
| Lufthansa Systems, Germany | Efficient shortest-paths computations with dynamic weights | | | | | X |
| Group of Peter Sanders (Karlsruhe), Germany | Libraries for parallel/external computation and energy-efficient sorting | Publications, software, Sorting World records | | X | | |
| GSI Helmholtz Centre for Heavy Ion Research, Germany | Foundations of memory-efficient information processing for FAIR computing | | | X | | |
| Group of Knut Reinert (FU Berlin), Germany | I/O-efficient traversal of large alignment graphs | | | X | | |
| Deepak Ajwani (University College Cork), Ireland | I/O-efficient algorithms, Top-K range reporting, Flash Memory, and parallel memory-cache algorithms | Publications | | X | | |
| Draper labs (Chris Yu), USA | Compressive sensing | Publication | | | | X |
| Shell Houston (Detlef Hoh), USA | Compressive sensing | Publication | | | | X |
| Alex Andoni (Microsoft Research), USA | Random sampling algorithms | Publication | | | | X |
| David Woodruff (IBM), USA | Streaming algorithms | Publications | | | | X |
| Mashhood Ishaque, Andrew Winslow, Sarah Cannon (Tufts), Matthew J. Patitz, Robert T. Schweller (Texas), Scott M. Summers (Wisconsin), USA | Self-Assembly | Publication | | X | | |
| Vi Hart (SUNY Stony Brook), USA | Balloon Polyhedra | Book chapter | | X | | |

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|--|---|--------------|--|---|--|--|
| Glencora Borradaile (U. Waterloo), Canada and Siamak Tazari (Humbolt), Germany | Bounded-Genus Graphs | Publication | | X | | |
| Takehiro Ito (Tohoku), Japan | Approximability of the Subset Sum Reconfiguration Problem | Publication | | X | | |
| MohammadTaghi Hajiaghayi (Maryland), USA, Hamid Mahini (Sharif), Iran, Noga Alon (Tel Aviv), Israel | Network Creation Games | Publication | | X | | |
| Sebastien Collette and Stefan Langerman (Bruxelles), Belgium | Narrow Misere Dots-and-Boxes | Book chapter | | X | | |
| Mohammad Ghodsi, Amin S. Sayedi-Roshkhar (Sharif), Iran, MohammadTaghi Hajiaghayi (Maryland), USA | Scheduling | Publication | | X | | |
| Anna Lubiw (Waterloo), Canada, Andre Schulz (Munster), Germany, Andrew Winslow, Diane Souvaine (Tufts U.), USA, Giovanni Viglietta (Pisa), Italy | Algorithms for Designing Pop-Up Cards | Publication | | X | | |
| Yair N. Minsky (Yale), Joseph Mitchell (SUNY Stony Brook), Mihai Patrascu (AT&T), USA | Picture-Hanging Puzzles | Publication | | X | | |
| Vida Dujmovic, Pat Morin (McGill), Canada, Ryuhei Uehara (JAIST), Japan | Ghost Chimneys | Publication | | X | | |

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|---|---|-------------|--|---|--|--|
| Ryuhei Uehara (JAIST), Japan | Any Monotone Boolean Function Can Be Realized by Interlocked Polygons | Publication | | X | | |
| Greg Aloupis (McGill), Canada | Classic Nintendo Games are (NP-) Hard | Publication | | X | | |
| Mirela Damian (Villanova), Robin Flatland (Siena College), MohammadTaghi Hajiaghayi (Maryland), Joseph O'Rourke (Smith College), Scott D. Kominers (Harvard), USA, Daniel Marx (Tel Aviv), Israel, Jin-ichi Itoh (Kumamoto), Japan, Anna Lubiw (Waterloo), Canada, Chie Nara (Tokai), Japan | Folding | Publication | | X | | |

CONFERENCES

SECTION B

List **includes** 2012 information for AU, as well as MIT, MPI and FRA researchers.
Only invited (and e.g. not conference contributed) talks are listed.

a) Organisation of international conferences, symposia, seminars etc. (*)

| Title of event |
|---|
| Workshop on Massive Data Algorithmics (MASSIVE) |
| Summer School on Algorithms for Modern Parallel and Distributed Models |
| Yearly meeting of the German Algorithm Engineering Cluster |
| Dagstuhl Perspectives Workshop: Publication Culture in Computing Research |
| FOCS Workshop on Data Structures |
| Workshop on Sparse Fourier Transform |

b) Number of Invited Talks

| Title of event | Venue | Name(s) of participant(s) |
|--|--|---------------------------|
| FOCS Workshop on Data Structures | New Brunswick, NJ, USA | Larsen |
| China Theory Week | Aarhus University, Denmark | Larsen |
| STOC Workshop on algorithms for memory-sensitive computing | NYU, New York, NY, USA | Arge |
| SoCG Workshop on Algorithms in the field | UNC, Chapel-Hill, NC, USA | Arge |
| ARO Big data workshop at large workshop | Duke, Durham, NC, USA | Arge |
| ESS Workshop | Copenhagen University, Denmark | Arge |
| NII Shonan Meeting on Large-scale Distributed Computation | NII, Japan | Zhang |
| Workshop on Algorithms for Data Streams | Dortmund, Germany | Zhang |
| Stringology 2012 | Safed, Israel | Kejlberg-Rasmussen |
| Seminar | NYU-Poly, New York, USA | Davoodi |
| Seminar | ETH, Zürich, Switzerland | Brodal |
| International Conference on Conceptual Modeling | Florence, Italy | Jensen |
| International Conference on Very Large Databases | Istanbul, Turkey | Jensen |
| International Workshop on Spatio-Temporal Data Integration and Retrieval | Washington D.C., USA | Jensen |
| KAIST ICC Global Lecture Series | KAIST, South Korea | Jensen |
| Workshop on Big Data Analysis and Management | Beijing, China | Jensen |
| Seminar | University of Zurich, Switzerland | Jensen |
| Seminar | Microsoft Research, China | Jensen |
| Summer Research Camp | Sha Shixuan International Research Center, China | Jensen |
| Sino-German Frontiers of Science Symposium | Nanjing, China | Meyer |
| Symposium: Alan Turing - Creator of Intellectual Currents | Bangalore & Kanpur, India | Mehlhorn |
| Excellence 2012 | Aarhus University, Denmark | Mehlhorn |
| Computer Science in Russia | Niznyi Novgorod, Russia | Indyk |
| Algorithmic Frontiers Workshop | EPFL, Switzerland | Indyk |
| Seminar | MSR, CA, USA | Indyk |
| SIAM Imaging Conference | Philadelphia, PA, USA | Indyk |
| Algorithms for Distributed and Streaming Data Workshop | STOC, New York, NY, USA | Indyk |
| Seminar | National Tsing Hua University, Taiwan | Demaine |
| Seminar | Academia Sinica, Taiwan | Demaine |

| | | |
|--|---|---------|
| 23rd International Symposium on Algorithm and Computation | Taipei, Taiwan | Demaine |
| Seminar | Israeli Origami Center, Israel | Demaine |
| Thailand-Japan Joint Conference on Computational Geometry and Graphs | Bangkok, Thailand | Demaine |
| Seminar | Two Sigma Investments, NY, USA | Demaine |
| Gathering for Gardner Celebration of Mind | Boston, Massachusetts | Demaine |
| Seminar | National Institutes of Health, USA | Demaine |
| FOCS Workshop on Data Structures (in memory of Mihai Patrascu) | New Brunswick, New Jersey | Demaine |
| Seminar | Abu Dhabi, United Arab Emirates | Demaine |
| Symposium on Geometry Processing | Tallinn, Estonia | Demaine |
| STOC Workshop on algorithms for memory-sensitive computing | NYU, New York, NY, USA | Demaine |
| Cairo Science Festival | Cairo, Egypt | Demaine |
| Cambridge Science Festival | Cambridge, MA, USA | Demaine |
| Gathering for Gardner 10 | Atlanta, GA, USA | Demaine |
| Seminar | University of Louisville, KY, USA | Demaine |
| American Physical Society March Meeting | Boston, MA, USA | Demaine |
| Seminar | Fuller Craft Museum, MN, USA | Demaine |
| Seminar | Carnegie Institution for Science, DC, USA | Demaine |
| Seminar | National Security Agency, DC, USA | Demaine |
| 2012 Joint Mathematics Meetings | Boston, MA, USA | Demaine |

EDUCATIONAL ACTIVITIES

SECTION C

List only **includes** 2012 information for AU employees (as well as relevant information for MIT, MPI and FRA employees taught **outside** their home institution). PhD student TA'ing is not included.

| Title of activity | ECTS | Length of course (number of hours) |
|---|-------------|---|
| BSc course: Algorithms and Data Structures 1, Spring 2012 | 5 | 28 |
| BSc course: Algorithms and Data Structures 2. Spring 2012 | 5 | 28 |
| BSc course: Computer Science in Perspective (topic Algorithms and Complexity, and Internet Algorithms, 2 out of 7 weeks). Fall 2012 | 5 | 6 |
| BSc course: Databases, Fall 2012 | 5 | 28 |
| Msc course: I/O-efficient algorithms. Spring 2012 | 10 | 30 |
| MSc course: Data Management for Moving Objects. Spring 2012 | 5 | 21 |
| MSc course: Multivariate analysis of biological data. Fall 2012 | 5 | 28 |
| MSc course: Computational Geometry. Fall 2012 | 10 | 40 |
| MSc: Database systems. Fall 2012 | 5 | 21 |
| PhD course: R for Macroecology. Spring 2012 | 5 | 30 |
| NCPC and NWERC Programming Contest Coaching | | |

| Number of Master Graduates | Number of Bachelor Graduates |
|-----------------------------------|-------------------------------------|
| 6 | 2 |

EXTERNAL FUNDING

SECTION D

List **only includes** information for AU employees; it includes all active/new funding in 2012.

| | Funding body | Purpose | Grant holder | Activity period | Granted amount in DKK | Partial amount allocated to the reported year |
|-----------------------------|------------------------------------|---|--|-----------------|-----------------------|---|
| Public Danish funds | Danish Minister of Research | Elite Researcher Award | AU (Arge) | 2010-2012 | 1.000.000 | ~940.000 |
| | Danish Minister of Research | EliteForsk Travel scholarship | AU (Larsen) | 2011-2013 | 300.000 | ~5000 |
| | State Library | PhD Fellowship | AU (Brodal and Nielsen) | 2011-2015 | ~1.000.000 | ~250.000 |
| Private Danish funds | Aarhus Universitets Forskningsfond | Center for Interdisciplinary Geospatial Informatics Research | Faculty of Natural Sciences, AU (incl Arge) | 2009-2012 | 2.500.000 | ~750.000 |
| | Villum Kann Rasmussen foundation | Annual Award for Technical and Scientific Research 2011 | AU (Jensen) | 2011–2021 | 2.000.000 | ~10.000 |
| International funds | Google | European Doctoral Fellowship | Dept. of Computer Science, AU (Arge and Larsen) | 2010-2013 | ~1.000.000 | 0 |
| | Slovenian Research Agency | Processing of Massive Geometric Data | University of Aribor, University of Primorska, AU (Arge and Brodal) and others | 2010-2013 | ~2.000.000 | ? |
| | European Commission | Reduction — Reducing Environmental Footprint based on Multi-Modal Fleet management Systems for Eco-Routing and Driver Behavior Adaptation | AU (Jensen) | 2011–2014 | ~3.400.000 | ~1.500.000 |
| | European Commission | GEOCROWD — Creating a Geospatial KnowledgeWorld | AU (Jensen) | 2010–2014 | ~4.250.000 | ~1.100.000 |

AWARDS**SECTION E**

List **includes** relevant 2012 information for AU as well as MIT, MPI and FRA researchers.

| Awards | Recipient | Granted amount in DKK, if relevant |
|--|---------------------------------|---|
| Best Paper Award (STOC) | Larsen | |
| Danny Lewin Award (STOC Best Student Paper Award) | Larsen | |
| NSERC Postgraduate Scholarship | Wilkinson | 350.000 |
| Fellow of the Association of Computing Machinery (ACM) | Arge | |
| Best Lecturer Award, Department of Computer Science, Aarhus University | Gerth Stølting Brodal | |
| MIT Faculty Research Innovation Fellowship | Indyk | 350.000 |
| "Ten Emerging Technologies", Technology Review | Hassanieh, Indyk, Katabi, Price | |
| Science Atlantic Outstanding Student Hall of Fame | Demaine | |
| Danish NCPC Programing Contest winner | Rav | 10.000 |

List **only includes** 2012 information for AU employees.

a) Electronic media

| Specific media (TV, radio, other) | Type of communication (interview, commentary, debate, feature program, etc.) | Subject | Contributor from the Center |
|--|--|---|-----------------------------|
| tv2oj.dk | News | Julehjerter på computeren | Brodal |
| ekstrabladet.dk | News | Data-lektor opfinder Julehjertermaskine | Brodal |
| dr.dk | News | Lektor opfinder personlig julepynt: Flet dit eget navn i et julehjerter | Brodal |
| Videnskab.dk | News | Forsker-opfindelse: Lav julehjerter med kærestens navn | Brodal |
| Berlingske.dk | News | Dansker afslører Googles begrænsninger | Larsen |
| JP.DK | News | Ung dansker har fundet Googles begrænsninger | Larsen |
| Videnskab.dk | News | Så effektive kan søgemaskiner blive | Larsen |
| Danmarks Radio, DR P1, Harddisken | Interview | Kort hjælper i katastrofesituationer | Arge |
| Danmarks Radio, DR P1, Videnskabens verden | Interview | En gigantisk database (International Centre for Earth Simulation) | Arge |
| Danmarks Radio, DR P1, Radioavisen | News | Ung dansker modtager pendant til Oscar inden for sit felt | Larsen, Arge |
| Version2.dk | News | Aarhusiansk datalogistuderende knækker database-nød med hård matematik | Larsen |
| Stiften.dk | News | Datalogiens Oscar går til århusianer | Larsen |
| version2 | Feature | Hacking/security (Studerende taler ud om kæmpehul: Pærelet at hacke 100.000 danske routere) | Skovsgaard |

b) Press

| Specific media (newspapers, journals, magazines, other) | Type of communication (interview, commentary, debate, feature, etc.) | Subject | Contributor from the Center |
|---|--|---|-----------------------------|
| Århus Stiftstidende | News | Aarhus-lektor skaber julehjertergenerator | Brodal |
| Viborg Stifts Folkeblad | News | Flet dit budskab i julehjerter | Brodal |

c) Other

| Specific type of communication (presentation/lecturing at open university, high school, etc.) | Subject | Contributor from the Center |
|---|---|-----------------------------|
| Lecture at Open spaces Aarhus | Datastrukturer og nedregrænser | Larsen |
| Friday lecture | Data structures and lower bounds | Larsen |
| Group exercises | Introduction to Algorithms for Primary and High School students | Brodal |
| Group exercises | Introduction to Algorithms at IT Camp 2012 (woman in CS initiative) | Brodal |
| Lecture at Open Space Aarhus | Julehjertegenerator | Brodal |
| Interacting with students at Nairobi University. | Entrepreneurship | Skovsgaard |
| Lecture at GOTO Copenhagen | Hacking/security | Skovsgaard |
| Interactive booth at "forskningens døgn" | Climate change | AU |

PATENTS AND APPLICATIONS

SECTION G

List **only includes** 2012 information for AU employees.

| Number of inventions reported to institution | Number of submitted patent applications | Number of granted patents | Number of mutually agreed licence, sale and option agreements | Names of spin-off companies established |
|---|--|----------------------------------|--|--|
| | | | | |

Publication list/counts **includes** relevant publications for AU as well as MIT, MPI and FRA researchers.

| TOTAL NUMBER OF PUBLICATIONS IN THE REPORTED YEAR | Peer reviewed | Not peer reviewed |
|---|---------------|-------------------|
| Number of journal articles | 27 | 0 |
| Number of conference proceedings | 61 | 4 |
| Number of monographs | 0 | 0 |
| Number of book chapters | 0 | 0 |
| Others | 0 | 12 |

The 10 most prestigious conferences within the Center's research area

| |
|---|
| 1. ACM Symposium on Theory of Computing (STOC) |
| 2. IEEE Symposium on Foundations of Computer Science (FOCS) |
| 3. ACM-SIAM Symposium on Discrete Algorithms (SODA) |
| 4. Symposium on Computational Geometry (SoCG) |
| 5. International Colloquium on Automata, Languages, and Programming (ICALP) |
| 6. European Symposium on Algorithms (ESA) |
| 7. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) |
| 8. International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)/ International Workshop on Randomization and Computation (RANDOM) |
| 9. Scandinavian Workshop on Algorithm Theory (SWAT)/Workshop on Algorithms and Data Structures (WADS) |
| 10. Workshop on Algorithm Engineering and Experiments (ALENEX) |

The 10 most prestigious journals in the Center's research area

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|--|
| 1. Journal of the ACM |
| 2. SIAM Journal on Computing |
| 3. ACM Transactions on Algorithms |
| 4. Discrete & Computational Geometry |
| 5. Algorithmica |
| 6. Journal of Computer and System Sciences |
| 7. Computational Geometry: Theory and Applications |
| 8. ACM Journal of Experimental Algorithmics |
| 9. Theoretical Computer Science |
| 10. Journal of Discrete Algorithms |

Bibliometric information

Distribution of center publications on 10 most prestigious conferences:

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---------------|------|------|------|------|------|------|
| STOC | 1 | | | | 3 | 4 |
| FOCS | 1 | 7 | 3 | 2 | 3 | 1 |
| SODA | | 6 | 5 | 6 | 6 | 11 |
| SoCG | | 5 | 3 | 3 | 2 | 3 |
| ICALP | 1 | | 7 | 1 | 3 | 2 |
| ESA | 3 | 1 | | 3 | 1 | 5 |
| SPAA | 3 | 1 | | 3 | 1 | 1 |
| APPROX/RANDOM | | 1 | | 1 | 3 | 0 |
| SWAT/WADS | 1 | 3 | 6 | 1 | 3 | 1 |
| ALENEX | | | 1 | | 1 | 0 |

STOC, FOCS and SODA can be rated as "best non specialized" conferences

SoCG and ALENEX can be rated as "best specialized" conferences

Center publications have been authored by 520 unique authors - 70 associated with the center and 450 not.

Only 109 center publications are by center researchers only.

Citations to center publication (according to Google scholar, which is the most reliable

- but certainly not perfect - source of citation information in the area) can be found at <http://scholar.google.com/citations?user=fRowhXcAAAAJ>

Conference proceedings

| | | | | | |
|-----|------|---|---|---|----------|
| C1 | 2007 | B. Escoffier, G. Moruz and A. Ribichini | Adapting Parallel Algorithms to the W-Stream Model, with Applications to Graph Problems | Proc. International Symposium on Mathematical Foundations of Computer Science (MFCS) | (PR)(CO) |
| C2 | 2007 | S. Guha, P. Indyk and A. McGregor | Sketching Information Divergences | Proc. Annual Conference on Learning Theory (COLT) | (PR)(CO) |
| C3 | 2007 | G. S. Brodal and A. G. Jørgensen | A Linear Time Algorithm for the k Maximal Sums Problem | Proc. International Symposium on Mathematical Foundations of Computer Science (MFCS) | (PR)(CO) |
| C4 | 2007 | G. S. Brodal, L. Georgiadis, K. A. Hansen and I. Katriel | Dynamic Matchings in Convex Bipartite Graphs | Proc. International Symposium on Mathematical Foundations of Computer Science (MFCS) | (PR)(CO) |
| C5 | 2007 | G. Jørgensen, G. Moruz and T. Mølhave | Resilient Priority Queues | Proc. International Workshop on Algorithms and Data Structures (WADS) | (PR) |
| C6 | 2007 | G. S. Brodal, R. Fagerberg, I. Finocchi, F. Grandoni, G. Italiano, A. G. Jørgensen, G. Moruz and T. Mølhave | Optimal Resilient Dynamic Dictionaries | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C7 | 2007 | P. K. Agarwal, L. Arge, A. Danner, H. Mitasova, T. Mølhave and K. Yi | TerraStream: From Elevation Data to Watershed Hierarchies | Proc. ACM International Symposium on Advances in Geographical Information Systems (ACM-GIS) | (PR)(CO) |
| C8 | 2007 | M. Patrascu and Mikkel Thorup | Planning for Fast Connectivity Updates | Proc. IEEE Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C9 | 2007 | G. Franceschini, S. Muthukrishnan, and M. Patrascu | Radix Sorting With No Extra Space | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C10 | 2007 | E. D. Demaine, S. Mozes, B. Rossman and O. Weimann | An Optimal Decomposition Algorithm for Tree Edit Distance | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C11 | 2007 | M. A. Bender, M. Farach-Colton, J. T. Fineman, Y. Fogel, B. C. Kuszmaul and J. Nelson | Cache-Oblivious Streaming B-trees | Proc. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C12 | 2007 | E. D. Demaine, M. Ghodsi, M. Hajiaghayi, A. S. Sayedi-Roshkhar and M. Zadimoghaddam | Scheduling to Minimize Gaps and Power Consumption | Proc. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C13 | 2007 | M. Patrascu | Lower Bounds for 2-Dimensional Range Counting | Proc. ACM Symposium on Theory of Computing (STOC) | (PR) |
| C14 | 2007 | G. M. Landau, D. Tsur and O. Weimann | Indexing a Dictionary for Subset Matching Queries | Proc. Symposium on String Processing and Information Retrieval (SPIRE) | (PR)(CO) |

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|-----|------|--|---|--|----------|
| C15 | 2007 | T. Friedrich and D. Ajwani | Average-Case Analysis of Online Topological Ordering | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C16 | 2007 | K. Chang | Multiple pass streaming algorithms for learning mixtures of distributions in \mathbb{R}^d | Proc. Algorithmic Learning Theory (ALT) | (PR) |
| C17 | 2007 | M. Westergaard, L. M. Kristensen, G. S. Brodal and L. Arge | The ComBack Method - Extending Hash Compaction with Backtracking | Proc. International Conference on Applications and Theory of Petri Nets and Other Models of Concurrency (ICATPN) | (PR) |
| C18 | 2007 | M. A. Bender, G. S. Brodal, R. Fagerberg, R. Jacob and E. Vicari | Optimal Sparse Matrix Dense Vector Multiplication in the I/O-Model | Proc. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C19 | 2007 | A. Golynski, R. Grossi, A. Gupta, R. Raman and S. S. Rao | On the Size of Succinct Indices | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C20 | 2007 | M. Olsen | Nash Stability in Additively Separable Hedonic Games is NP-hard | Proc. Conference on Computability in Europe (CIE) | (PR) |
| C21 | 2008 | M. Ruzic and P. Indyk | Near-Optimal Sparse Recovery in the L1 norm | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C22 | 2008 | M. Patrascu | (Data) STRUCTURES | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR) |
| C23 | 2008 | M. Patrascu | Succincter | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR) |
| C24 | 2008 | E. Demaine, S. Langerman and E. Price | Confluently Persistent Tries for Efficient Version Control | Proc. Scandinavian Workshop on Algorithm Theory (SWAT) | (PR)(CO) |
| C25 | 2008 | D. Ajwani, I. Malingier, U. Meyer and S. Toledo | Characterizing the Performance of Flash Memory Storage Devices and Its Impact on Algorithm Design | Proc. Workshop on Experimental Algorithms (WEA) | (PR)(CO) |
| C26 | 2008 | U. Meyer | On Dynamic Breadth-First Search in External-Memory | Proc. Symposium on Theoretical Aspects (STACS) | (PR) |
| C27 | 2008 | U. Meyer | On Trade-Offs in External-Memory Diameter Approximation | Proc. Scandinavian Workshop on Algorithm Theory (SWAT) | (PR) |
| C28 | 2008 | G. S. Brodal and A. G. Jørgensen | Selecting Sums in Arrays | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C29 | 2008 | L. Arge, G. S. Brodal and S. S. Rao | External Memory Planar Point Location with Logarithmic Updates | Proc. Symposium on Computational Geometry (SoCG) | (PR) |
| C30 | 2008 | A. Golynski, R. Raman and S. S. Rao | On the Redundancy of Succinct Data Structures | Proc. Scandinavian Workshop on Algorithm Theory (SWAT) | (PR)(CO) |
| C31 | 2008 | M. Olsen | The Computational Complexity of Link Building | Proc. International Conference on Computing and Combinatorics (COCOON) | (PR) |

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|-----|------|---|---|---|----------|
| C32 | 2008 | M.A. Abam, M. de Berg and J. Gudmundsson | A Simple and Efficient Kinetic Spanner | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C33 | 2008 | L. Arge, M.T. Goodrich, M. Nelson and N. Sitchinava | Fundamental Parallel Algorithms for Private-Cache Chip Multiprocessors | Proc. Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C34 | 2008 | L. Arge, T. Moelhave and N. Zeh | Cache-Oblivious Red-Blue Line Segment Intersection | Proc. European Symposium on Algorithm (ESA) | (PR)(CO) |
| C35 | 2008 | P.K. Agarwal, L. Arge, T. Moelhave and B. Sadri | I/O-efficient Algorithms for Computing Contour Lines on a Terrain | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C36 | 2008 | J. Feldman, S. Muthukrishnan, A. Sidiropoulos, C. Stein and Z. Svitkina | On Distributing Symmetric Streaming Computations | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C37 | 2008 | P. Indyk | Explicit Constructions for Compressed Sensing of Sparse Signals | Proc Symposium on Discrete Algorithms (SODA) | (PR) |
| C38 | 2008 | A. Andoni, P. Indyk and R. Krauthgamer | Earth Mover Distance over High-Dimensional Spaces | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C39 | 2008 | P. Indyk and A. McGregor | Declaring Independence via the Sketching of Sketches | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C40 | 2008 | K. Onak and A. Sidiropoulos | Circular Partitions with Applications to Visualization and Embeddings | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C41 | 2008 | J. Matousek and A. Sidiropoulos | Inapproximability for metric embeddings into R^d | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C42 | 2008 | N. J. A. Harvey, J. Nelson and K. Onak | Sketching and Streaming Entropy via Approximation Theory | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C43 | 2008 | A. Andoni, D. Croitoru and M. Patrascu | Hardness of Nearest Neighbor under L-infinity | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C44 | 2008 | T. Chan, M. Patrascu and L. Roditty | Dynamic Connectivity: Connecting to Networks and Geometry | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C45 | 2008 | S. Mozes, K. Onak and Oren Weimann | Finding an Optimal Tree Searching Strategy in Linear Time | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C46 | 2008 | A. Chakrabarti, T.S. Jayram and M. Patrascu | Tight Lower Bounds for Selection in Randomly Ordered Streams | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C47 | 2008 | E. Demaine, T. Ito, Ni. J. A. Harvey, C. H. Papadimitriou, M. Sideri, R. Uehara and Yushi Uno | On the Complexity of Reconfiguration Problems | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C48 | 2008 | E. Demaine, G. Aloupis, S. Collette, S. Langerman, V. Sacristan and S. Wuhrer | Reconfiguration of Cube-Style Modular Robots Using $O(\log n)$ Parallel Moves | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |

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| C49 | 2008 | E. Demaine, M. Buadoiu, M. Hajiaghayi, A. Sidiropoulos and M. Zadimoghaddam | Ordinal Embedding: Approximation Algorithms and Dimensionality Reduction | Proc. International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) | (PR)(CO) |
| C50 | 2008 | E. Demaine, T. G. Abbott, Z. Abel, D. Charlton, M. L. Demaine and S. D. Kominers | Hinged Dissections Exist | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C51 | 2008 | E. R. Hansen, S. S. Rao and P. Tiedemann | Compressing Binary Decision Diagrams | European Conference on Artificial Intelligence (ECAI) | (PR)(CO) |
| C52 | 2008 | R. Berinde, P. Indyk and M. Ruzic | Practical Near-Optimal Sparse Recovery in the L1 Norm (invited paper) | Proc. Allerton Conference | (CO) |
| C53 | 2008 | R. Berinde, A. Gilbert, P. Indyk, H. Karloff and M. Strauss | Combining Geometry and Combinatorics: A Unified Approach to Sparse Signal Recovery (invited paper) | Proc. Allerton Conference | (CO) |
| C54 | 2008 | M.A. Abam, M. de Berg, and S-H. Poon | Fault-Tolerant Conflict-Free Coloring | Proc. Canadian Conference on Computational Geometry | (CO) |
| C55 | 2009 | R. Berinde, G. Cormode, P. Indyk and M. Strauss | Space-optimal Heavyhitters with Strong Error Bounds | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C56 | 2009 | V. Cevher, C. Hegde, P. Indyk and R. G. Baraniuk | Recovery of Clustered Sparse Signal from Compressive Measurements | Proc. International Conference on Sampling Theory and Applications (SAMPTA) | (PR)(CO) |
| C57 | 2009 | E. Demaine, G. Landau and O. Weimann | On Cartesian Trees and Range Minimum Queries | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C58 | 2009 | D. Hermelin, G. M. Landau, S. Landau and O. Weimann | A Unified Algorithm for Accelerating Edit-Distance Computation via Text-Compression | Proc. International Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C59 | 2009 | A. Kovacs, U. Meyer, G. Moruz and A. Negoescu | Online Paging for Flash Memory Devices | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C60 | 2009 | G. Brodal, A. Jørgensen, G. Moruz and T. Mølhave | Counting in the Presence of Memory Faults | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C61 | 2009 | D. Ajwani, A. Beckmann, R. Jacob, U. Meyer and G. Moruz | On Computational Models for Flash Memory Devices | Proc. Symposium on Experimental Algorithms (SEA) | (PR)(CO) |
| C62 | 2009 | U. Meyer and V. Osipov | Design and Implementation of a Practical I/O-efficient Shortest Paths Algorithm | Proc. Workshop on Algorithm Engineering and Experiments (ALENEX) | (PR) |
| C63 | 2009 | U. Meyer | Via Detours to I/O-Efficient Shortest Paths | Proc. Efficient Algorithms - Essays dedicated to Kurt Mehlhorn on the Occasion of his 60th birthday | |

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| C64 | 2009 | D. Ajwani, R. Dementiev, U. Meyer and V. Osipov | Breadth First Search on Massive Graphs | Proc. Ninth DIMACS Implementation Challenge: The Shortest Path Problem | (PR) |
| C65 | 2009 | A. Beckmann, R. Dementiev and J. Singler | Building a Parallel Pipelined External Memory Algorithm Library | Proc. International Symposium on Parallel and Distributed Processing (IPDPS) | (PR) |
| C66 | 2009 | G. S. Brodal and A. Jørgensen | Data Structures for Range Median Queries | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C67 | 2009 | G. S. Brodal, R. Fagerberg, M. Greve and A. López-Ortiz | Online Sorted Range Reporting | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C68 | 2009 | G. S. Brodal, A. Kaporis, S. Sioutas, K. Tsakalidis and K. Tsihclas | Dynamic 3-sided Planar Range Queries with Expected Doubly Logarithmic Time | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C69 | 2009 | G. S. Brodal, A. Jørgensen and T. Mølhave | Fault Tolerant External Memory Algorithms | Proc. Algorithms and Data Structures Symposium (WADS) | (PR) |
| C70 | 2009 | A. Kaporis, A.N. Papadopoulos, S. Sioutas, K. Tsakalidis and K. Tsihclas | Efficient Processing of 3-Sided Range Queries with Probabilistic Guarantees | Proc. International Conference on Database Theory (ICDT) | (PR)(CO) |
| C71 | 2009 | M. Abam, M. de Berg, M. Farshi, J. Gudmundsson and M. Smid | Geometric Spanners for Weighted Point Sets | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C72 | 2009 | M. Abam and M. de Berg | Kinetic Spanners in R^d | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C73 | 2009 | M. Abam, P. Carmi, M. Farshi and M. Smid | On the Power of the Semi-Separated Pair Decomposition | Proc. Algorithms and Data Structures Symposium (WADS) | (PR)(CO) |
| C74 | 2009 | D. Ajwani | On P-complete Problems in Memory Hierarchy Models | Proc. Workshop on Massive Data Algorithmics (MASSIVE) | |
| C75 | 2009 | A. Farzan, R. Raman and S. Srinivasa Rao | Universal Succinct Representations of Trees? | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C76 | 2009 | R. Pagh and S. Srinivasa Rao | Secondary Indexing in One Dimension: Beyond B-trees and Bitmap Indexes | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C77 | 2009 | R. Grossi, A. Orlandi, R. Raman and S. Srinivasa Rao | More Haste, Less Waste: Lowering the Redundancy in Fully Indexable Dictionaries | Proc. International Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C78 | 2009 | J. E. Moeslund, P. K. Bøcher, J.-C. Svenning, T. Mølhave and L. Arge | Impacts of 21st Century Sea-level Rise on a Danish Major City – An Assessment Based on Fine-resolution Digital Topography and a New Flooding Algorithm | IOP Conference Series: Earth and Environmental Science 8 | (PR) |
| C79 | 2009 | M. de Berg and P. Hachenberger | Rotated-Box Trees: A Lightweight c -Oriented Bounding-Volume Hierarchy | Proc. International Symposium on Experimental Algorithms (SEA) | (PR)(CO) |
| C80 | 2009 | P. Afshani, L. Arge and K. Dalgaard Larsen | Orthogonal Range Reporting in Three and Higher Dimensions | Proc Symposium on Foundations of Computer Science (FOCS) | (PR) |

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|-----|------|--|---|---|----------|
| C81 | 2009 | P. Afshani, C. Hamilton and N. Zeh | A Unified Approach for Cache-Oblivious Range Reporting and Approximate Range Counting | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C82 | 2009 | P. Afshani, C. Hamilton and N. Zeh | Cache-Oblivious Range Reporting With Optimal Queries Requires Superlinear Space | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C83 | 2009 | P. Afshani, J. Barbay and T. Chan | Instance-optimal Geometric Algorithms | Proc Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C84 | 2009 | L. Arge, M.T. Goodrich and N. Sitchinava | Parallel External Memory Model | Proc. Workshop on Theory and Many-Cores | |
| C85 | 2009 | L. Arge and M. Revsbæk | I/O-Efficient Contour Tree Simplification | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C86 | 2009 | A. Andoni, P. Indyk, R. Krauthgamer and H.L. Nguyen | Approximate Line Nearest Neighbor in High Dimensions | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C87 | 2009 | A. Andoni, P. Indyk and R. Krauthgamer | Overcoming the L1 Non-embeddability Barrier: Algorithms for Product Metrics | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C88 | 2009 | R. Berinde and P. Indyk | Sequential Sparse Matching Pursuit | Proc. Allerton Conference | (PR)(CO) |
| C89 | 2009 | A. Andoni, K. Do Ba, P. Indyk and D. Woodruff | Efficient Sketches for Earth-Mover Distance, with Applications | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C90 | 2009 | A. Andoni, P. Indyk, K. Onak and R. Rubinfeld | External Sampling | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C91 | 2009 | E. Demaine, M. Demaine, G. Konjevod and R. Lang | Folding a Better Checkerboard | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C92 | 2009 | J. Cardinal, E. Demaine, M. Demaine, S. Imahori, S. Langerman and R. Uehara | Algorithmic Folding Complexity | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C93 | 2009 | E. Demaine, M. Hajiaghayi, and D. Marx | Minimizing Movement: Fixed-Parameter Tractability | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C94 | 2009 | B. Ballinger, D. Charlton, E. Demaine, M. Demaine, J. Iacono, C-H. Liu and S-H. Poon | Minimal Locked Trees | Proc. Algorithms and Data Structures Symposium (WADS) | (PR)(CO) |
| C95 | 2009 | E. Demaine, D. Kane and G. Price | A Pseudopolynomial algorithm for Alexandrov's Theorem | Proc. Algorithms and Data Structures Symposium (WADS) | (PR)(CO) |
| C96 | 2009 | T. Ito, M. Kaminski and E. Demaine | Reconfiguration of List Edge-Colorings in a Graph | Proc. Algorithms and Data Structures Symposium (WADS) | (PR)(CO) |
| C97 | 2009 | E. Demaine, M. Hajiaghayi and K. Kawarabayashi | Approximation Algorithms via Structural Results for Apex-Minor-Free Graphs | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C98 | 2009 | E. Demaine, M. Hajiaghayi and P. Klein | Node-Weighted Steiner Tree and Group Steiner Tree in Planar Graphs | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |

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| C99 | 2009 | E. Demaine, G. Borradaile and S. Tazari | Polynomial-Time Approximation Schemes for Subset-Connectivity Problems in Bounded-Genus Graphs | Proc. International Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C100 | 2009 | E. Demaine, D. Harmon, J. Iacono, D. Kane and M. Patrascu | The Geometry of Binary Search Trees | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C101 | 2009 | E. Demaine, K. Kawarabayashi and M. Hajiaghayi | Additive Approximation Algorithms for List-Coloring Minor-Closed Class of Graphs | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C102 | 2009 | E. Demaine, M. Hajiaghayi, H. Mahini and M. Zadimoghaddam | The Price of Anarchy in Cooperative Network Creation Games | Proc. International Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C103 | 2009 | J. Cardinal, E. Demaine, S. Fiorini, G. Joret, I. Newman and O. Weimann | The Stackelberg Minimum Spanning Tree Game on Planar and Bounded-Treewidth Graphs | Proc. Workshop on Internet and Network Economics (WINE) | (PR)(CO) |
| C104 | 2009 | J. McLurkin and E. Demaine | A Distributed Boundary Detection Algorithm for Multi-Robot Systems | Proc. International Conference on Intelligent Robots and Systems | (PR)(CO) |
| C105 | 2009 | G. Aloupis, N. Benbernou, M. Damian, E. Demaine, R. Flatland, J. Iacono and S. Wuhrer | Efficient Reconfiguration of Lattice-Based Modular Robots | Proc. European Conference on Mobile Robots | (PR)(CO) |
| C106 | 2009 | M. Ajtai, V. Feldman, A. Hassidim and J. Nelson | Sorting and Selection with Imprecise Comparisons | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C107 | 2009 | R. Yuster and O. Weimann | Computing the Girth of a Planar Graph in $O(n \log n)$ time | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR)(CO) |
| C108 | 2009 | R. Backofen, G. Landau, M. Möhl, D. Tsur and O. Weimann | Fast RNA Structure Alignment for Crossing Input Structures | Proc. Symposium on Combinatorial Pattern Matching (CPM) | (PR)(CO) |
| C109 | 2009 | P. Klein, S. Mozes and O. Weimann | Shortest Paths in Directed Planar Graphs with Negative Lengths: A Linear-Space $O(n \log^2 n)$ -Time Algorithm | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C110 | 2010 | K. Do Ba, P. Indyk, E. Price and D.P. Woodruff | Lower Bounds for Sparse Recovery | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C111 | 2010 | P. Indyk, H.Q. Ngo and A. Rudra | Efficiently Decodable Non-adaptive Group Testing | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C112 | 2010 | D.M. Kane, J. Nelson and D.P. Woodruff | An Optimal Algorithm for the Distinct Elements Problem | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C113 | 2010 | J. Nelson and D.P. Woodruff | Fast Manhattan Sketches in Data Streams | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C114 | 2010 | I. Diakonikolas, D.M. Kane and J. Nelson | Bounded Independence Fools Degree-2 Threshold Functions | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |

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| C115 | 2010 | D.M. Kane, J. Nelson and D.P. Woodruff | On the Exact Space Complexity of Sketching and Streaming Small Norms | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C116 | 2010 | A. Beckmann, U. Meyer, P. Sanders and J. Singler | Energy-Efficient Sorting using Solid State Disks | Proc. International IEEE Green Computing Conference | (PR)(CO) |
| C117 | 2010 | M. Greve, A.G. Jørgensen, K.D. Larsen and J. Truelsen | Cell Probe Lower Bounds and Approximations for Range Mode | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR) |
| C118 | 2010 | M. Olsen | Maximizing PageRank with new Backlinks | Proc. International Conference on Algorithms and Complexity (CIAC) | (PR) |
| C119 | 2010 | G.S. Brodal, E. Demaine, J. T. Fineman, J. Iacono, S. Langerman and J.I. Munro | Cache-Oblivious Dynamic Dictionaries with Optimal Update/Query Tradeoff | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C120 | 2010 | A. Kaporis, A.N. Papadopoulos, S. Sioutas, K. Tsakalidis and K. Tsichlas | Efficient Processing of 3-Sided Range Queries with Probabilistic Guarantees | Proc. International Conference on Database Theory (ICDT) | (PR)(CO) |
| C121 | 2010 | M.A. Abam and S. Har-Peled | New constructions of SSPDs and their applications | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C122 | 2010 | M.B. Kjærgaard, H. Blunck, T. Godsk, T. Toftkjær, D.L. Christensen, and K. Grønbæk | Indoor Positioning using GPS Revisited | Proc. International Conference on Pervasive Computing (Pervasive) | (PR) |
| C123 | 2010 | L. Arge, M.T. Goodrich and N. Sitchinava | Parallel external memory graph algorithms | Proc. International Parallel & Distributed Processing Symposium (IPDPS) | (PR)(CO) |
| C124 | 2010 | P. Afshani, L. Arge and K.D. Larsen | Orthogonal Range Reporting: Query Lower Bounds, Optimal Structures in 3-d, and Higher Dimensional Improvements | Proc. Symposium on Computational Geometry (SoCG) | (PR) |
| C125 | 2010 | P. Afshani, L. Arge and K.D. Larsen | I/O-Efficient Orthogonal Range Reporting in Three and Higher Dimensions | Proc. Workshop on Massive Data Algorithmics (MASSIVE) | |
| C126 | 2010 | T. Mølhave, P.K. Agarwal, L. Arge and M. Revsbæk | Scalable Algorithms for Large High-Resolution Terrain Data | Proc. International Conference on Computing for Geospatial Research & Application (COM.GEO) | (PR)(CO) |
| C127 | 2010 | L. Arge, M. Revsbæk and Norbert Zeh | I/O-Efficient Computation of Water Flow Across a Terrain | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C128 | 2010 | G.S. Brodal, P. Davoodi and S.S. Rao | On Space Efficient Two Dimensional Range Minimum Data Structures | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C129 | 2010 | D. Ajwani, N. Sitchinava and N. Zeh | Geometric Algorithms for Private-Cache Chip Multiprocessors | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C130 | 2010 | Z. Abel, N. Benbernou, M. Damian, E.D. Demaine, M.L. Demaine, R. Flatland, S. Kominers and R. Schwelle | Shape Replication Through Self-Assembly and RNase Enzymes | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |

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|------|------|--|--|---|----------|
| C131 | 2010 | E.D. Demaine, M. Hajiaghayi and K. Kawarabayashi | Decomposition, Approximation, and Coloring of Odd-Minor-Free Graphs | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C132 | 2010 | N. Gershenfeld, D. Dalrymple, K. Chen, A. Knaian, F. Green, E.D. Demaine, S. Greenwald and P. Schmidt-Nielsen | Reconfigurable Asynchronous Logic Automata | Proc. Symposium on Principles of Programming Languages (POPL) | (PR)(CO) |
| C133 | 2010 | G. Aloupis, J. Cardinal, S. Collette, E.D. Demaine, M.L. Demaine, M. Dulieu, R. Fabila-Monroy, V. Hart, F. Hurtado, S. Langerman, M. Saumell, C. Seara and P. Taslakian | Matching Points with Things | Proc. Latin American Theoretical Informatics Symposium (LATIN) | (PR)(CO) |
| C134 | 2010 | E.D. Demaine and M. Zadimoghaddam | Scheduling to Minimize Power Consumption using Submodular Functions | Proc. Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR) |
| C135 | 2010 | S. Gilbert, R. Guerraoui, F. Malakouti and M. Zadimoghaddam | Collaborative Scoring in the Presence of Malicious Players | Proc. Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C136 | 2010 | N. Alon, E.D. Demaine, M. Hajiaghayi and T. Leighton | Basic Network Creation Games | Proc. Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C137 | 2010 | E.D. Demaine and M. Zadimoghaddam | Minimizing the Diameter of a Network using Shortcut Edge | Proc. Scandinavian Workshop on Algorithm Theory (SWAT) | (PR) |
| C138 | 2010 | M. Bateni, M.H. Hajiaghayi and M. Zadimoghaddam | Submodular Secretary Problem and Extensions | Proc. Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) | (PR)(CO) |
| C139 | 2010 | B. Ballinger, N. Benbernou, P. Bose, M. Damian, E.D. Demaine, V. Dujmović, R. Flatland, F. Hurtado, J. Iacono, A. Lubiw, P. Morin, V. Sacristán, D. Souvaine and R. Uehara | Coverage with k-Transmitters in the Presence of Obstacles | Proc. International Conference on Combinatorial Optimization and Applications (COCOA) | (PR)(CO) |
| C140 | 2010 | E.D. Demaine and M. Zadimoghaddam | Constant Price of Anarchy in Network Creation Games via Public Service Advertising | Proc. International Workshop on Algorithms and Models for the Web-Graph | (PR) |
| C141 | 2010 | G. S. Brodal, C. Kejlberg-Rasmussen and J. Truelsen | A Cache-oblivious Implicit Dictionary with the Working Set Property | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) |
| C142 | 2010 | L. Arge, K. D. Larsen, T. Mølhave and F. van Walderveen | Cleaning Massive Sonar Point Clouds | Proc. International Conference on Advances in Geographic Information System (ACM-GIS) | (PR) |
| C143 | 2010 | G.S Brodal, Ss.Sioutas, K. Tsihclas and C. Zaroliagis | D2-Tree: A New Overlay with Deterministic Bounds | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C144 | 2010 | F. Gieseke, G. Moruz and J. Vahrenhold | Resilient kd-trees: K-means in space revisited | Proc. Conference on Data Mining (ICDM) | (PR)(CO) |

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|------|------|---|--|--|----------|
| C145 | 2010 | J. Brody and E. Verbin | The Coin Problem and Pseudorandomness for Branching Programs | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C146 | 2011 | H. Blunck, M. B. Kjærsgaard and T. S. Toftegaard | Sensing and Classifying Impairments of GPS Reception on Mobile Devices | Proc. International Conference on Pervasive Computing (Pervasive) | (PR)(CO) |
| C147 | 2011 | A. G. Jorgensen and K. G. Larsen, | Range Selection and Median: Tight Cell Probe Lower Bounds and Adaptive Data Structures | Proc. Symposium on Discrete Algorithms (SODA) | (PR) |
| C148 | 2011 | P. Afshani, P. K. Agarwal, L. Arge, K. G. Larsen and J. M. Phillips | (Approximate) Uncertain Skylines | Proc. International Conference on Database Theory (ICDT) | (PR)(CO) |
| C149 | 2011 | T. M. Chan, K. G. Larsen and M. Patrascu | Orthogonal Range Searching on the RAM, Revisited | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C150 | 2011 | K. G. Larsen | On Range Searching in the Group Model and Combinatorial Discrepancy | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR) |
| C151 | 2011 | M. de Berg and C. Tsirogiannis | Exact and Approximate Computations of Watersheds on Triangulated Terrains | Proc. International Conference on Advances in Geographic Information Systems (ACM-GIS) | (PR)(CO) |
| C152 | 2011 | H. Haverkort and C. Tsirogiannis | Flow on Noisy Terrains: An Experimental Evaluation | Proc. International Conference on Advances in Geographic Information Systems (ACM-GIS) | (PR)(CO) |
| C153 | 2011 | D. Ajwani, N. Sitchinava and N. Zeh | I/O-Optimal Distribution Sweeping on Private-Cache Chip Multiprocessors | Proc. International Symposium on Parallel and Distributed Processing (IPDPS) | (PR)(CO) |
| C154 | 2011 | M.T. Goodrich, N. Sitchinava and Q. Zhang | Sorting, Searching, and Simulation in the MapReduce Framework | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C155 | 2011 | M. A. Abam, S. Daneshpajouh, L. Deleuran, S. Ehsani and M. Ghodsi | Computing Homotopic Line Simplification in a Plane | Proc. European Workshop on Computational Geometry (EuroCG) | (CO) |
| C156 | 2011 | P. Afshani and N. Zeh | Improved Space Bounds for Cache-Oblivious Range Reporting | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C157 | 2011 | P. Afshani, G.S. Brodal and N. Zeh | Ordered and Unordered Top-K Range Reporting in Large Data Sets | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C158 | 2011 | G.S. Brodal, G. Moruz, and A. Negoescu | OnlineMin: A Fast Strongly Competitive Randomized Paging Algorithm | Proc. Workshop on Approximation and Online Algorithms (WAOA) | (PR) |
| C159 | 2011 | G.S. Brodal, P. Davoodi, and S.S. Rao | Path Minima Queries in Dynamic Weighted Trees | Proc. Workshop on Algorithms and Data Structures (WADS) | (PR)(CO) |
| C160 | 2011 | G.S. Brodal and K. Tsakalidis | Dynamic Planar Range Maxima Queries | Proc. International Colloquium on Automata, Languages, and Programming (ICALP) | (PR) |

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|------|------|---|---|---|-----------|
| C161 | 2011 | G.S. Brodal, M. Greve, V. Pandey and S.S. Rao | Integer Representations towards Efficient Counting in the Bit Probe Model | Proc. Conference on Theory and Applications of Models of Computation (TAMC) | (PR)(CO) |
| C162 | 2011 | H.L. Chan, T.W. Lam, L.K. Lee, J. Pan, H.F. Ting and Q. Zhang | Edit Distance to Monotonicity in Sliding Windows | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR) (CO) |
| C163 | 2011 | D. Ajwani, A. Cosgaya-Lozano and N. Zeh | Engineering a Topological Sorting Algorithm for Massive Graphs | Proc. Workshop on Algorithm Engineering and Experiments (ALENEX) | (PR)(CO) |
| C164 | 2011 | S.H. Chan, T.W. Lam, L.K. Lee, C.M. Liu and H.F. Ting | Sleep management on multiple machines for energy and flow time | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR) (CO) |
| C165 | 2011 | A.G. Jørgensen, M. Löffler and J. Phillips | Geometric Computations on Indecisive Points | Proc. International Workshop on Algorithms and Data Structures (WADS) | (PR)(CO) |
| C166 | 2011 | P. Davoodi and S. Srinivasa Rao | Succinct Dynamic Cardinal Trees with Constant Time Operations for Small Alphabet | Proc. Theory and Applications of Models of Computation (TAMC) | (PR)(CO) |
| C167 | 2011 | E. Verbin and W. Yu | The Streaming Complexity of Cycle Counting, Sorting By Reversals, and Other Problems | Proc. Symposium on Discrete Algorithms (SODA) | (PR) |
| C168 | 2011 | U. Meyer, A. Negoescu and V. Weichert | New bounds for old algorithms: On the average-case behavior of classic single-source shortest path approaches | Proc. Conference on Theory and Practice of Algorithms in (Computer) Systems (TAPAS) | (PR) |
| C169 | 2011 | M. Manjunath, K. Mehlhorn, K. Panagiotou and H. Sun | Approximate Counting of Cycles in Streams | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C170 | 2011 | E. Price | Efficient Sketches for the Set Query Problem | Proc. Symposium on Discrete Algorithms (SODA) | (PR) |
| C171 | 2011 | P. Indyk and E. Price | K-Median Clustering, Model-Based Compressive Sensing, and Sparse Recovery for Earth Mover Distance | Proc. Symposium on Theory of Computing (STOC) | (PR) |
| C172 | 2011 | P. Indyk, E. Price and D. P. Woodruff | On the Power of Adaptivity in Sparse Recovery | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C173 | 2011 | R. Gupta, P. Indyk, E. Price and Y. Rachlin | Compressive Sensing with Local Geometric Features | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C174 | 2011 | E. Price and D. P. Woodruff | (1+ ϵ s)-approximate sparse recovery | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR)(CO) |
| C175 | 2011 | D. M. Kane, J. Nelson, E. Porat and D. P. Woodruff | Fast Moment Estimation in Data Streams in Optimal Space | Proc. Symposium on Theory of Computing (STOC) | (PR)(CO) |

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| C176 | 2011 | D. M. Kane, R. Meka and J. Nelson | Almost Optimal Explicit Johnson-Lindenstrauss Transformations | Proc. International Workshop on Randomization and Computation (RANDOM) | (PR)(CO) |
| C177 | 2011 | D. B. Khanh and P. Indyk | Sparse recovery with partial support knowledge | Proc. Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) | (PR)(CO) |
| C178 | 2011 | K. Kawarabayashi, P. N. Klein and C. Sommer | Linear-Space Approximate Distance Oracles for Planar, Bounded-Genus, and Minor-Free Graphs | Proc. International Colloquium on Automata, Languages, and Programming (ICALP) | (PR)(CO) |
| C179 | 2011 | C. Gavaille and C. Sommer | Sparse Spanners vs. Compact Routing | Proc. Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C180 | 2011 | H. N. Djidjev and C. Sommer | Approximate Distance Queries for Weighted Polyhedral Surfaces | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C181 | 2011 | D. Alistarh, J. Aspnes, K. Censor-Hillel, S. Gilbert and M. Zadimoghaddam | Optimal-Time Adaptive Tight Renaming, with Applications to Counting | Proc. Symposium on Principles of Distributed Computing (PODC) | (PR)(CO) |
| C182 | 2011 | A. Karbasi and M. Zadimoghaddam | Compression with Graphical Constraints: An Interactive Browser | Proc. International Symposium on Information Theory (ISIT) | (PR)(CO) |
| C183 | 2011 | B. Haeupler, V. Mirrokni and M. Zadimoghaddam | Online Stochastic Weighted Matching: Improved Approximation Algorithms | Proc. Workshop on Internet & Network Economics | (PR)(CO) |
| C184 | 2011 | Z. Abel, E. D. Demaine, M. L. Demaine, S. Eisenstat, J. Lynch, T. B. Scharidl and I. Shapiro-Elowitz | Folding Equilateral Plane Graphs | Proc. International Symposium on Algorithms and Computation (ISAAC) | (PR)(CO) |
| C185 | 2011 | E. D. Demaine, S. Eisenstat, M. Ishaque and A. Winslow | One-Dimensional Staged Self-Assembly | Proc. International Conference on DNA Computing and Molecular Programming | (PR)(CO) |
| C186 | 2011 | E. D. Demaine, M. L. Demaine, S. Eisenstat, A. Lubiw and A. Winslow | Algorithms for Solving Rubik's Cubes | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C187 | 2011 | E. D. Demaine and S. Eisenstat | Flattening Fixed-Angle Chains Is Strongly NP-Hard | Proc. International Workshop on Algorithms and Data Structures (WADS) | (PR) |
| C188 | 2011 | P. Christiano, E. D. Demaine and S. Kishore | Lossless Fault-Tolerant Data Structures with Additive Overhead | Proc. International Workshop on Algorithms and Data Structures (WADS) | (PR)(CO) |
| C189 | 2011 | P. Berman, E. D. Demaine and M. Zadimoghaddam | $O(1)$ -Approximations for Maximum Movement Problems | Proc. Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) | (PR)(CO) |
| C190 | 2011 | G. Aloupis, E. D. Demaine, M. L. Demaine, V. Dujmovic and J. Iacono | Meshes preserving minimum feature size | Proc. Spanish Meeting on Computational Geometry | (CO) |
| C191 | 2011 | E. D. Demaine and A. Lubiw | A generalization of the source unfolding of convex polyhedra | Proc. Spanish Meeting on Computational Geometry | (CO) |

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|------|------|--|---|---|----------|
| C192 | 2011 | E. D. Demaine, M. Hajiaghayi and K. Kawarabayashi | Contraction Decomposition in H-Minor-Free Graphs and Algorithmic Applications | Proc. Symposium on Theory of Computing (STOC) | (PR)(CO) |
| C193 | 2011 | E. D. Demaine, M. J. Patitz, R. T. Schweller and S. M. Summers | Self-Assembly of Arbitrary Shapes Using RNAse Enzymes: Meeting the Kolmogorov Bound with Small Scale Factor | Proc. Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C194 | 2011 | E. D. Demaine and A. Schulz | Embedding Stacked Polytopes on a Polynomial-Size Grid | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C195 | 2012 | P. Davoodi, M. Smid and F. van Walderveen | Two-Dimensional Range Diameter | Proc. Latin American Symposium on Theoretical Informatics (LATIN) | (PR)(CO) |
| C196 | 2012 | L. Arge, M.T. Goodrich and F. van Walderveen | Computing betweenness centrality in external memory | Workshop on Massive Data Algorithmics (MASSIVE) | (CO) |
| C197 | 2012 | K. G. Larsen and R. Pagh | I/O-Efficient Data Structures for Colored Range and Prefix Reporting | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C198 | 2012 | T. M. Chan, S. Durocher, K. G. Larsen, J. Morrison and B. T. Wilkinson | Linear-Space Data Structures for Range Mode Query in Arrays | Proc. Symposium on Theoretical Aspects of Computer Science (STACS) | (PR)(CO) |
| C199 | 2012 | K. G. Larsen | The Cell Probe Complexity of Dynamic Range Counting | Proc. Symposium on Theory of Computing (STOC) | (PR) |
| C200 | 2012 | P. Afshani, L. Arge and K. G. Larsen | Higher-dimensional Orthogonal Range Reporting and Rectangle Stabbing in the Pointer Machine Model | Proc. Symposium on Computational Geometry (SoCG) | (PR) |
| C201 | 2012 | K. G. Larsen and H. L. Nguyen | Improved Range Searching Lower Bounds | Proc. Symposium on Computational Geometry (SoCG) | (PR)(CO) |
| C202 | 2012 | K. G. Larsen | Higher Cell Probe Lower Bounds for Evaluating Polynomials | Proc. Symposium on Foundations of Computer Science (FOCS) | (PR) |
| C203 | 2012 | L. Arge, L. Deleuran, T. Mølhave, M. Revsbæk and J. Truelsen | Simplifying Massive Contour Maps | Proc. European Symposium on Algorithms (ESA) | (PR) |
| C204 | 2012 | Z. Huang, K. Yi and Q. Zhang, | Randomized Algorithms for Tracking Distributed Count, Frequencies, and Ranks | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C205 | 2012 | D.P. Woodruff and Q. Zhang | Tight Bounds for Distributed Functional Monitoring | Proc. Symposium on Theory of Computing (STOC) | (PR)(CO) |
| C206 | 2012 | J. M. Phillips, E. Verbin and Q. Zhang | Lower Bounds for Number-in-Hand Multiparty Communication Complexity, Made Easy | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C207 | 2012 | E. Verbin and Q. Zhang | Rademacher-Sketch: A Dimensionality-Reducing Embedding for Sum-Product Norms, with an Application to Earth-Mover Distance | Proc. International Colloquium on Automata, Languages and Programming (ICALP) | (PR) |

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|------|------|---|--|---|----------|
| C208 | 2012 | H.L. Chan, S.H. Chan, T.W. Lam, L.K. Lee, and J. Zhu | Non-clairvoyant weighted flow time scheduling with rejection penalty | Proc. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C209 | 2012 | G. S. Brodal, J. A. S. Nielsen and J. Truelssen | Finger search in the implicit model | Proc. International Symposium on Algorithms and Computation (STACS) | (PR) |
| C210 | 2012 | G.S. Brodal and C. Kejlberg-Rasmussen | Cache-Oblivious Implicit Predecessor Dictionaries with the Working-Set Property | Proc. Symposium on Theoretical Aspects of Computer Science (STACS) | (PR) |
| C211 | 2012 | X. Sun , C. Wang and W. Yu | The Relationship between Inner Product and Counting Cycles | Proc. Latin American Theoretical Informatics Symposium (LATIN) | (PR)(CO) |
| C212 | 2012 | P. Davoodi, R. Raman and S. S. Rao | Succinct Representations of Binary Trees for Range Minimum Queries | Proc. International Computing and Combinatorics Conference (COCOON) | (PR)(CO) |
| C213 | 2012 | G.S. Brodal, S. Sioutas, K. Tsakalidis and K. Tsihclas | Fully Persistent B-trees | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C214 | 2012 | G.S. Brodal, G. Lagogiannis and R.E. Tarjan. | Strict Fibonacci Heaps | Proc. Symposium on Theory of Computing (STOC) | (PR)(CO) |
| C215 | 2012 | G.S Brodal, P. Davoodi, M. Lewenstein, R. Raman and S. S. Rao | Two Dimensional Range Minimum Queries and Fibonacci Lattices | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C216 | 2012 | D. Ajwani, A. Beckmann, U. Meyer and D. Veith | I/O-efficient approximation of graph diameter by parallel cluster growing - a first experimental study | Proc. Workshop on Parallel Systems and Algorithms (PASA) | (PR)(CO) |
| C217 | 2012 | A. Beckmann, J. Fedorowicz, J.Keller and U. Meyer | A structural analysis of the A5/1 state transition graph | Proc. Workshop on Graph Inspection and Traversal Engineering (GRAPHite) | (PR)(CO) |
| C218 | 2012 | G. Moruz and A. Negoescu | Outperforming LRU via Competitive Analysis on Parametrized Inputs for Paging | Proc. Symposium on Discrete Algorithms (SODA) | (PR) |
| C219 | 2012 | G. Moruz, A. Negoescu, C. Neumann and V. Weichert | Engineering Efficient Paging Algorithms | Proc. Symposium on Experimental Algorithms (SEA) | (PR) |
| C220 | 2012 | H. Hassanieh, P. Indyk, D. Katabi and E. Price | Simple and Practical Algorithm for Sparse Fourier Transform | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C221 | 2012 | H. Hassanieh, P. Indyk, D. Katabi and E. Price | Nearly Optimal Sparse Fourier Transform | Proc. Symposium on Theory of Computing (STOC) | (PR)(CO) |
| C222 | 2012 | S. Mozes and C. Sommer | Exact Distance Oracles for Planar Graphs | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C223 | 2012 | T. Akiba, C. Sommer and K-i Kawarabayashi | Shortest-Path Queries for Complex Networks: Exploiting Low Tree-width Outside the Core | Proc. International Conference on Extending Database Technology (EDBT) | (PR)(CO) |
| C224 | 2012 | S. Kreutzer and S. Tazari | Directed Nowhere Dense Classes of Graphs | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C225 | 2012 | V.S. Mirrokni, S. O. Gharan and M. Zadimoghaddam | Simultaneous approximations for adversarial and stochastic online budgeted allocation | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C226 | 2012 | D. M. Kane and J. Nelson | Sparser Johnson-Lindenstrauss Transforms | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |

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|------|------|---|---|--|----------|
| C227 | 2012 | C. Tsirogiannis, B. Sandel and D. Cheliotis | Efficient Computation of Popular Phylogenetic Tree Measures | Proc. Workshop on Algorithms in Bioinformatics (WABI) | (PR)(CO) |
| C228 | 2012 | L. Arge, H. Haverkort and C. Tsirogiannis | Fast Generation of Multiple Resolution Instances of Raster Data Sets | Proc. International Conference on Advances in Geographic Information Systems (ACM-GIS) | (PR)(CO) |
| C229 | 2012 | P. Afshani and N. Zeh | Lower Bounds for Sorted Geometric Queries in the I/O Model | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C230 | 2012 | P. Afshani | Improved pointer machine and I/O lower bounds for simplex range reporting and related problems | Proc. ACM Symposium on Computational Geometry (SoCG) | (PR) |
| C231 | 2012 | T. M. Chan, S. Durocher, M. Skala, and B. T. Wilkinson | Linear-Space Data Structures for Range Minority Query in Arrays | Proc. Scandinavian Workshop on Algorithm Theory (SWAT) | (PR)(CO) |
| C232 | 2012 | H. Jowhari | Efficient Communication Protocols for Deciding Edit Distance | Proc. European Symposium on Algorithms (ESA) | (PR) |
| C233 | 2012 | L. K. Lee, M. Lewenstein and Q. Zhang. | Parikh matching in the streaming model | Proc. International Symposium on String Processing and Information Retrieval (SPIRE) | (PR)(CO) |
| C234 | 2012 | D. Belazzougui and R. Venturini | Compressed String Dictionary Look-up with Edit Distance One | Proc. Symposium on Combinatorial Pattern (CPM) | (PR)(CO) |
| C235 | 2012 | B. Ammitzbøll Jurik and J.A.S. Nielsen | Audio Quality Assurance: An Application of Cross Correlation | Proc. iPRES Conference | (PR)(CO) |
| C236 | 2012 | N. Sitchinava and N. Zeh | A parallel buffer tree | Proc. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) | (PR)(CO) |
| C237 | 2012 | D. Ajwani, U. Meyer and D. Veith | I/O-efficient Hierarchical Diameter Approximation | Proc. European Symposium on Algorithms (ESA) | (PR)(CO) |
| C238 | 2012 | D. Kane, K. Mehlhorn, T. Sauerwald and H. Sun | Counting Arbitrary Subgraphs in Data Streams | Proc. International Colloquium on Automata, Languages, and Programming (ICALP) | (PR) |
| C239 | 2012 | M. Wibral, P. Wollstadt, U. Meyer, N. Pampu, V. Priesemann and R. Vicente | Revisiting Wiener's principle of causality – interaction-delay reconstruction using transfer entropy and multivariate analysis on delay-weighted graphs | Proc. International Conference in Medicine & Biology Society (EMBC) | (PR)(CO) |
| C240 | 2012 | P. Indyk, R. Levi and R. Rubinfeld | Approximating and Testing k-Histogram Distributions in Sub-linear Time | Proc. Symposium on Principles of Database Systems (PODS) | (PR)(CO) |
| C241 | 2012 | J. Wang, H. Hassanieh, D. Katabi and P. Indyk | Efficient and Reliable Low-Power Backscatter Networks | Proc. International Conference on Mobile Computing and Networking (SIGCOMM) | (PR)(CO) |
| C242 | 2012 | H. Hassanieh, F. Adib, D. Katabi and P. Indyk | Faster GPS Via the Sparse Fourier Transform | Proc. MOBICOM | (PR)(CO) |

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| C243 | 2012 | E. Price and D. Woodruff | Applications of the Shannon-Hartley Theorem to Data Streams and Sparse Recovery | Proc. International Symposium on Information Theory (ISIT) | (PR)(CO) |
| C244 | 2012 | L. Hamilton, D. Parker, C. Yu and P. Indyk | Focal Plane Array Folding for Efficient Information Extraction and Tracking | Proc. Applied Imagery Patterns Recognition Workshop (AIPR) | (PR)(CO) |
| C245 | 2013 | E. Price and D. Woodruff | Lower Bounds for Adaptive Sparse Recovery | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C246 | 2013 | A. Andoni, H. Hassanieh, P. Indyk and D. Katabi | Shift Finding in Sub-linear Time | Proc. Symposium on Discrete Algorithms (SODA) | (PR)(CO) |
| C247 | 2012 | E.D. Demaine, M.L. Demaine, Y. N. Minsky, J.S.B. Mitchell, R.L. Rivest and M. Patrascu | Picture-Hanging Puzzles | Proc. International Conference on Fun with Algorithms | (CO) |
| C248 | 2012 | E. D. Demaine, M.L. Demaine, J-i. Itoh, A. Lubiw, C. Nara and J. O'Rourke | Refold Rigidity of Convex Polyhedra | Proc. European Workshop on Computational Geometry | (CO) |
| C249 | 2012 | S. Lim, C. Sommer, E. Nikolova and D. Rus | Practical Route Planning Under Delay Uncertainty: Stochastic Shortest Path Queries | Proc. Robotics: Science and Systems VIII | (PR)(CO) |
| C250 | 2012 | C. Ratti and C. Sommer | Approximating Shortest Paths in Spatial Social Networks | Proc. International Conference on Social Computing | (PR)(CO) |
| C251 | 2012 | M. Zadimoghaddam and A. Roth | Efficiently Learning from Revealed Preference | Proc. International Workshop on Internet and Network Economics | (PR)(CO) |
| C252 | 2012 | C. Guo, Y. Ma, B. Yang, C. S. Jensen and M. Kaul | Evaluating Models of Vehicular Environmental Impact | Proc. International Conference on Advances in Geographic Information Systems (ACM-GIS) | (PR)(CO) |
| C253 | 2012 | X. Li, P. Karras, L. Shi, K.-L. Tan and C. S. Jensen | Cooperative Scalable Moving Continuous Query Processing | Proc. International Conference on Mobile Data Management (MDM) | (PR)(CO) |
| C254 | 2012 | D. Šidlauskas, C. S. Jensen and S. Šaltenis | A Comparison of the Use of Virtual Versus Physical Snapshots for Supporting Update-Intensive Workloads | Proc. International Workshop on Data Management on New Hardware (DaMoN) | (PR)(CO) |
| C255 | 2012 | J. Rishede, M. L. Yiu and C. S. Jensen | Effective Caching of Shortest Paths for Location-Based Services | Proc. International Conference on the Management of Data (SIGMOD) | (PR)(CO) |
| C256 | 2012 | D. Šidlauskas, S. Šaltenis and C. S. Jensen | Parallel Main-Memory Indexing for Moving-Object Query and Update Workloads | Proc. International Conference on the Management of Data (SIGMOD) | (PR)(CO) |
| C257 | 2012 | H. Lu, X. Cao and C. S. Jensen | A Foundation for Efficient Indoor Distance-Aware Query Processing | Proc. International Conference on Data Engineering (ICDE) | (PR)(CO) |
| C258 | 2012 | H. Lu and C. S. Jensen | Upgrading Uncompetitive Products Economically | Proc. International Conference on Data Engineering (ICDE) | (PR)(CO) |
| C259 | 2012 | X. Cao, L. Chen, G. Cong, C. S. Jensen, Q. Qu, A. Skovsgaard, D. Wu and M. L. Yiu | Spatial Keyword Querying (invited paper) | Proc. International Conference on Conceptual Modeling (ER) | (CO) |

Journals

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|-----|------|---|---|---|----------|
| J1 | 2007 | G. S. Brodal, R. Fagerberg and G. Moruz | On the Adaptiveness of Quicksort | ACM Journal of Experimental Algorithmics, 12 | (PR)(CO) |
| J2 | 2008 | D. Ajwani, T. Friedrich and U. Meyer | An $O(n^{\{2.75\}})$ Algorithm for Incremental Topological Ordering | ACM Transactions on Algorithms, 4(4) | (PR) |
| J3 | 2008 | M. Stissing, T. Mailund, C. N. S. Pedersen, G. S. Brodal and R. Fagerberg | Computing the All-Pairs Quartet Distance on a set of Evolutionary Trees | Journal of Bioinformatics and Computational Biology, 6(1) | (PR)(CO) |
| J4 | 2008 | L. Arge, M. de Berg, H. J. Haverkort and K. Yi | The Priority R-Tree: A Practically Efficient and Worst-Case Optimal R-Tree | ACM Transactions on Algorithms, 4(1) | (PR)(CO) |
| J5 | 2009 | M. Olsen | Nash Stability in Additively Separable Hedonic Games and Community Structures | Theory of Computing Systems, 45(4) | (PR) |
| J6 | 2009 | M. Abam, M. de Berg, M. Farshi and J. Gudmundsson | Region-Fault Tolerant Geometric Spanners | Discrete & Computational Geometry, 41(4) | (PR)(CO) |
| J7 | 2009 | M. Abam, M. de Berg and B. Speckmann | Kinetic kd-Trees and Longest-Side kd-Trees | SIAM Journal of Computing, 39(4) | (PR)(CO) |
| J8 | 2009 | L. Arge, V. Samoladas and K. Yi | Optimal External-Memory Planar Point Enclosure | Algorithmica, 54(3) | (PR)(CO) |
| J9 | 2009 | L. Arge, M. de Berg and H. Haverkort | Cache-Oblivious R-Trees | Algorithmica, 53(1) | (PR)(CO) |
| J10 | 2009 | H. Iben, J. O'Brien and E. Demaine | Refolding Planar Polygons | Discrete & Computational Geometry, 41(3) | (PR)(CO) |
| J11 | 2009 | E. Demaine, M. Hajiaghayi, H. Mahini, A. Sayedi-Roshkhar, S. Oveisgharan and M. Zadimoghaddam | Minimizing Movement | ACM Transactions on Algorithms, 5(3) | (PR)(CO) |
| J12 | 2009 | E. Demaine, M. Hajiaghayi and K. Kawarabayashi | Algorithmic Graph Minor Theory: Improved Grid Minor Bounds and Wagner's Contraction | Algorithmica, 54(2) | (PR)(CO) |
| J13 | 2009 | T. Abbott, M. Burr, T. Chan, E. Demaine, M. Demaine, J. Hugg, D. Kane, S. Langerman, J. Nelson, E. Rafalin, K. Seyboth and V. Yeung | Dynamic Ham-Sandwich Cuts in the Plane | Computational Geometry: Theory and Applications, 42(5) | (PR)(CO) |
| J14 | 2009 | E.D. Demaine, M. Hajiaghayi, H. Mahini and M. Zadimoghaddam | The Price of Anarchy in Network Creation Games | ACM SIGECOM Exchanges, 8(2) | (PR)(CO) |
| J15 | 2009 | E.D. Demaine, M.L. Demaine, J. Iacono and S. Langerman | Wrapping Spheres with Flat Paper | Computational Geometry: Theory and Applications, 42(8) | (PR)(CO) |
| J16 | 2010 | P. Indyk and A. Gilbert | Sparse Recovery Using Sparse Matrices | Proceedings of the IEEE June 2010 | (PR)(CO) |
| J17 | 2010 | E.D. Demaine, S.Langerman and E. Price | Confluently Persistent Tries for Efficient Version Control | Algorithmica 57(3) | (PR)(CO) |
| J18 | 2010 | M.A. Abam, M. de Berg, P. Hachenberger and A. Zarei | Streaming Algorithms for Line Simplification | Discrete & Computational Geometry 43(3) | (PR)(CO) |
| J19 | 2010 | M.A. Abam, M. de Berg and J. Gudmundsson | A Simple and Efficient Kinetic Spanner | Computational Geometry: Theory and Applications 43(3) | (PR)(CO) |
| J20 | 2010 | D. Ajwani and T. Friedrich | Average-case Analysis of Incremental Topological Ordering | Discrete Applied Mathematics 158 | (PR)(CO) |

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|-----|------|--|---|---|----------|
| J21 | 2010 | H. Blunck and J. Vahrenhold | In-Place Algorithms for Computing (Layers of) Maxima | Algorithmica 57(1) | (PR)(CO) |
| J22 | 2010 | P. Indyk, Z. Syed, C. Stultz, M. Kellis and J. Gutttag | Motif discovery in physiological datasets: A methodology for inferring predictive elements | ACM Transactions on Knowledge Discovery in Data 4(1) | (PR)(CO) |
| J23 | 2010 | E. Hawkes, B. An, N. M. Benbernou, H. Tanaka, S. Kim, E.D. Demaine, D. Rus and R.J. Wood | Programmable matter by folding | Proceedings of the National Academy of Sciences of the United States of America 107(28) | (PR)(CO) |
| J24 | 2010 | J.L. Bredin, E.D. Demaine, M. Hajiaghayi and D. Rus | Deploying Sensor Networks with Guaranteed Fault Tolerance | IEEE/ACM Transactions on Networking 18(1) | (PR)(CO) |
| J25 | 2010 | E.D. Demaine, J. Iacono and S. Langerman | Grid Vertex-Unfolding Orthostacks | International Journal of Computational Geometry and Applications 20(3) | (PR)(CO) |
| J26 | 2010 | E.D. Demaine, S.P. Fekete, G. Rote, N. Schweer, D. Scymura and M. Zelke | Integer Point Sets Minimizing Average Pairwise L_1 Distance: What is the Optimal Shape of a Town? | Computational Geometry: Theory and Applications 44(2) | (PR)(CO) |
| J27 | 2010 | R. Connelly, E.D. Demaine, M.L. Demaine, S. Fekete, S. Langerman, J. S. B. Mitchell, A. Ribó and G. Rote | Locked and Unlocked Chains of Planar Shapes | Discrete & Computational Geometry 44(2) | (PR)(CO) |
| J28 | 2010 | P.K. Agarwal, L. Arge and K. Yi | I/O-Efficient Batched Union-Find and Its Applications to Terrain Analysis | ACM Transactions on Algorithms 7(1) | (PR)(CO) |
| J29 | 2010 | P. Afshani, C. Hamilton and N. Zeh | A General Approach for Cache-Oblivious Range Reporting and Approximate Range Counting | Computational geometry: Theory and applications 43(8) | (PR)(CO) |
| J30 | 2010 | J. Katajainen and S. S. Rao | A compact data structure for representing a dynamic multiset | Information Processing Letters 110(23) | (PR)(CO) |
| J31 | 2010 | M.A. Bender, G.S. Brodal, R. Fagerberg, R. Jacob and E. Vicari | Optimal Sparse Matrix Dense Vector Multiplication in the I/O-Model | Theory of Computing Systems 47(4) | (PR)(CO) |
| J32 | 2010 | C. Demetrescu, B. Escoffier, G. Moruz and A. Ribichini | Adapting Parallel Algorithms to the W-Stream Model, with Applications to Graph Problems | Theoretical Computer Science 411(44-46) | (PR)(CO) |
| J33 | 2011 | J. E. Moeslund, L. Arge, P. K. Bøcher, B. Nygaard and J.-C. Svenning | Geographically Comprehensive Assessment of Salt-Meadow Vegetation-Elevation Relations Using LiDAR | Wetlands 31(3) | (PR)(CO) |
| J34 | 2011 | B. Sandel, L. Arge, B. Dalsgaard, R. Davies, K. Gaston, W. Sutherland and J.-C. Svenning | The influence of Late Quaternary climate-change velocity on species endemism | Science 334 | (PR)(CO) |

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|-----|------|---|---|---|-----------|
| J35 | 2011 | B. Dalsgaard, E. Magård, J. Fjeldså, A.M. Martín González, C. Rahbek, J. Olesen, J. Ollerton, R. Alarcón, A.C. Araujo, P.A. Cotton, C. Lara, C.G. Machado, I. Sazima, M. Sazima, A. Timmermann, S. Watts, B. Sandel, W. Sutherland and J.-C. Svenning | Specialization in Plant-Hummingbird Networks Is Associated with Species Richness, Contemporary Precipitation and Quaternary Climate-Change Velocity | PLoS ONE 6 | (PR)(CO) |
| J36 | 2011 | B. Sandel, M. Krupa and J. Corbin | Using plant functional traits to guide restoration: A case study in California coastal grassland | Ecosphere 2 | (PR)(CO) |
| J37 | 2011 | P. Afshani, C. Hamilton and N. Zeh | Cache-Oblivious Range Reporting With Optimal Queries Requires Superlinear Space | Discrete & Computational Geometry 45(4) | (PR)(CO) |
| J38 | 2011 | G.S. Brodal, B. Gfeller, A.G. Jørgensen and P. Sanders | Towards Optimal Range Medians | Theoretical Computer Science 412(24) | (PR)(CO) |
| J39 | 2011 | M. Kutz, G.S. Brodal, K. Kaligosi and I. Katriel | Faster Algorithms for Computing Longest Common Increasing Subsequences | Journal of Discrete Algorithms 9(4) | (PR)(CO) |
| J40 | 2011 | M.A. Bender, G.S. Brodal, R. Fagerberg, D. Ge, S. He, H. Hu, J. Iacono and A. López-Ortiz | The Cost of Cache-Oblivious Searching | Algorithmica 61(2) | |
| J41 | 2011 | H.L. Chan, T.W. Lam, L.K. Lee and H.F. Ting | Approximating frequent items in asynchronous data stream over a sliding window | Algorithmica 4(3) | (PR) (CO) |
| J42 | 2011 | C. Daskalakis, R. M. Karp, E. Mossel, S. Riesenfeld and E. Verbin | Sorting and Selection in Posets | SIAM Journal of Computing | (PR)(CO) |
| J43 | 2011 | M. A. Abam and M. de Berg | Kinetic Spanners in R^d | Discrete & Computational Geometry 45(4) | (PR)(CO) |
| J44 | 2011 | M. A. Abam, M. de Berg, M. Farshi, J. Gudmundsson and M. H. M. Smid | Geometric Spanners for Weighted Point Sets | Algorithmica 61(1) | (PR)(CO) |
| J45 | 2011 | M. A. Abam, P. K. Agarwal, M. de Berg and H. Yu | Out-of-Order Event Processing in Kinetic Data Structures | Algorithmica 60(2) | (PR)(CO) |
| J46 | 2011 | J. Freixas, X. Molinero, M. Olsen and M. J. Serna | On the Complexity of Problems on Simple Games | RAIRO - Operations Research 45(4) | (PR)(CO) |
| J47 | 2011 | A. Beckman, U. Meyer, P. Sanders and J. Singler | Energy-Efficient Sorting using Solid State Disks | Sustainable Computing: Informatics and Systems 1(2) | (PR)(CO) |
| J48 | 2011 | E. D. Demaine, S. P. Fekete, G. Rote, N. Schweer, D. Schymura and M. Zelke | Integer Point Sets Minimizing Average Pairwise L1 Distance: What is the Optimal Shape of a Town? | Computational Geometry: Theory and Applications 44(2) | (PR)(CO) |
| J49 | 2011 | B. An, N. Benbernou, E. D. Demaine and D. Rus | Planning to Fold Multiple Objects from a Single Self-Folding Sheet | Robotica 29(1) | (PR)(CO) |

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|-----|------|--|---|--|----------|
| J50 | 2011 | G. Aloupis, S. Collette, M. Damian, E. D. Demaine, R. Flatland, S. Langerman, J. O'Rourke, V. Pinciu, S. Ramaswami, V. Sacristan and S. Wuhler | Efficient constant-velocity reconfiguration of crystalline robots | Robotica 29(1) | (PR)(CO) |
| J51 | 2011 | E. D. Demaine, M. L. Demaine, V. Hart, G. N. Price and T. Tachi | (Non)existence of Pleated Folds: How Paper Folds Between Creases | Graphs and Combinatorics 27(3) | (PR)(CO) |
| J52 | 2011 | E. D. Demaine, M. L. Demaine, V. Hart, J. Iacono, S. Langerman and J. O'Rourke | Continuous Blooming of Convex Polyhedra | Graphs and Combinatorics 27(3) | (PR)(CO) |
| J53 | 2011 | J. Cardinal, E. D. Demaine, M. L. Demaine, S. Imahori, T. Ito, M. Kiyomi, S. Langerman, R. Uehara and T. Uno | Algorithmic Folding Complexity | Graphs and Combinatorics 27(3) | (PR)(CO) |
| J54 | 2011 | K. C. Cheung, E. D. Demaine, J. Bachrach and S. Griffith | Programmable Assembly With Universally Foldable Strings (Moteins) | IEEE Transactions on Robotics 27(4) | (PR)(CO) |
| J55 | 2011 | G. Aloupis, P. Bose, E. D. Demaine, S. Langerman, H. Meijer, M. Overmars and G. T. Toussaint | Computing Signed Permutations of Polygons | International Journal of Computational Geometry and Applications 21(1) | (PR)(CO) |
| J56 | 2011 | T. Ito, E. D. Demaine, N. J. A. Harvey, C. H. Papadimitriou, M. Sideri, R. Uehara and Y. Uno | On the Complexity of Reconfiguration Problems | Theoretical Computer Science 412(12-14) | (PR)(CO) |
| J57 | 2011 | H. Ahn, S. Bae, E. D. Demaine, M. L. Demaine, S. Kim, M. Korman, I. Reinbacher and W. Son | Covering points by disjoint boxes with outliers | Computational Geometry: Theory and Applications 44(3) | (PR)(CO) |
| J58 | 2011 | J. Cardinal, E. D. Demaine, S. Fiorini, G. Joret, S. Langerman, I. Newman and O. Weimann | The Stackelberg Minimum Spanning Tree Game | Algorithmica 59(2) | (PR)(CO) |
| J59 | 2011 | H. Haverkort and F. van Walderveen | Four-Dimensional Hilbert Curves for R-Trees | Journal of Experimental Algorithmics 16 | (PR)(CO) |
| J60 | 2012 | B. Sandel and J. Corbin | Scale and diversity following manipulation of productivity and disturbance in Californian coastal grasslands. | Journal of Vegetation Science 23 | (PR)(CO) |
| J61 | 2012 | M. Schleuning, J. Fründ, A. M. Klein, S. Abrahamczyk, R. Alarcón, M. Albrecht, G.K.S. Andersson, S. Bazarian, K. Böhning-Gaese, R. Bommarco, B. Dalsgaard, D.M. Dehling, A. Gottlieb, M. Hagen, T. Hickler, A. Holzschuh, C.N. Kaiser-Bunbury, H. Kreft, R.J. Morris, B. Sandel, W.J. Sutherland, J-C. Svenning, T. Tschardtke, S. Watts, C.N. Weiner, M. Werner, N.M. Williams, C. Winqvist, C.F. Dormann and N. Blüthgen | Specialization of Mutualistic Interaction Networks Decreases toward Tropical Latitudes | Current Biology 22 | (PR)(CO) |

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|-----|------|---|---|--|----------|
| J62 | 2012 | B. Sandel and E. Dangremond | Climate change and the invasion of California by grasses | Global Change Biology 18 | (PR)(CO) |
| J63 | 2012 | P. Afshani, P. K. Agarwal, L. Arge, K. G. Larsen and J. M. Phillips | (Approximate) Uncertain Skylines | Theory of Computing Systems | (PR)(CO) |
| J64 | 2012 | P. K. Agarwal, L. Arge, H. Kaplan, E. Molad, R. E. Tarjan and K Yi | An Optimal Dynamic Data Structure for Stabbing-Semigroup Queries | SIAM Journal on Computing 41(1) | (PR)(CO) |
| J65 | 2012 | L. Arge, G.S. Brodal and S. S. Rao | External memory planar point location with logarithmic updates | Algorithmica 63(1-2) | (PR)(CO) |
| J66 | 2012 | G. S. Brodal, P. Davoodi and S. S. Rao | On Space Efficient Two Dimensional Range Minimum Data Structures | Algorithmica 63(4) | (PR)(CO) |
| J67 | 2012 | G.S. Brodal, G. Moruz and A. Negoescu | OnlineMin: A Fast Strongly Competitive Randomized Paging Algorithm | Theory of Computing Systems | (PR) |
| J68 | 2012 | H.L. Chan, T.W. Lam, L.K. Lee and H.F. Ting | Continuous monitoring of distributed data streams over a time-based sliding window | Algorithmica 62(3-4) | (PR)(CO) |
| J69 | 2012 | G. Cormode, S. Muthukrishnan, K. Yi and Q. Zhang | Continuos sampling from distributed streams | Journal of the ACM 59(2) | (PR)(CO) |
| J70 | 2012 | U. Meyer and N. Zeh | I/O-efficient shortest path algorithms for undirected graphs with random and bounded edge lengths | ACM Transactions on algorithms 8(3) | (PR)(CO) |
| J71 | 2012 | F. Gieseke, G. Moruz and J. Vahrenhold | Resilient K-d Trees: K-Means in Space Revisited. | Frontiers of Computer Science 6(2) | (PR)(CO) |
| J72 | 2012 | E.D. Demaine, M. Hajiaghayi, H. Mahini and M. Zadimoghaddam | The Price of Anarchy in Network Creation Games | ACM Transactions on Algorithms 8(2) | (PR)(CO) |
| J73 | 2012 | O. Aichholzer, F. Aurenhammer, E.D. Demaine, F. Hurtado, P. Ramos and J. Urrutia | On k-convex polygons | Computational Geometry: Theory and Applications 45(3) | (PR)(CO) |
| J74 | 2012 | T.G. Abbott, Z. Abel, D. Charlton, E.D. Demaine, M.L. Demaine and S.D. Kominers | Hinged Dissections Exist | Discrete & Computational Geometry 47(1) | (PR)(CO) |
| J75 | 2012 | M. Greve, A.M. Lykke, C.W. Fagg, J. Bogaert, I. Friis, R. Marchant, A.R. Marshall, J. Ndayishimiye, B. Sandel, C. Sandom, M. Schmidt, J.R. Timberlake, J.J. Wieringa, G. Zizka and J.-C. Svenning | Continental-scale variability in browser diversity is a major driver of diversity patterns in acacias across Africa | Journal of Ecology 100 | (PR)(CO) |
| J76 | 2012 | R. Gupta, P. Indyk, E. Price and Y. Rachlin | Compressive Sensing with Local Geometric Features | International Journal of Computational Geometry and Applications 22(4) | (PR)(CO) |
| J77 | 2012 | D. Charlton, E.D. Demaine, M.L. Demaine, V. Dujmovic, P. Morin and R. Uehara | Ghost Chimneys | International Journal of Computational Geometry and Applications 47(1) | (PR)(CO) |
| J78 | 2012 | E.D. Demaine, M.L. Demaine and R. Uehara | Any Monotone Boolean Function Can Be Realized by Interlocked Polygons | Algorithms 5(1) | (PR)(CO) |

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|-----|------|--|---|---|----------|
| J79 | 2012 | E.D. Demaine and M. Zadimoghaddam | Constant Price of Anarchy in Network-Creation Games via Public-Service Advertising | Internet Mathematics 8(1-2) | (PR) |
| J80 | 2012 | L. Moll, S. Tazari and M. Thurley | Computing hypergraph width measures exactly | Information Processing Letters 112(6) | (PR)(CO) |
| J81 | 2012 | S. Tazari | Faster approximation schemes and parameterized algorithms on (odd-) H-minor-free graphs | Theoretical Computer Science 417 | (PR) |
| J82 | 2012 | D. Wu, G. Cong and C. S. Jensen | A Framework for Efficient Spatial Web Object Retrieval | VLDB Journal 21(6) | (PR)(CO) |
| J83 | 2012 | D. Wu, M. L. Yiu, G. Cong and C. S. Jensen | Joint Top-K Spatial Keyword Query Processing | IEEE Transaction on Knowledge and Data Engineering 24(10) | (PR)(CO) |
| J84 | 2012 | X. Cao, G. Cong, B. Cui, C. S. Jensen and Q. Yuan | Approaches to Exploring Category Information for Question Retrieval in Community Question Answer Archives | ACM Transactions on Information Systems 30(2) | (PR)(CO) |
| J85 | 2012 | M. Yiu, L., I. Assent, C. S. Jensen and P. Kalnis | Outsourced Similarity Search on Metric Data Assets | IEEE Transactions on Knowledge and Data Engineering 24(2) | (PR)(CO) |
| J86 | 2012 | X. Cao, G. Cong, C. S. Jensen, J. J. Ng, B. C. Ooi, N.-T. Phan and D. Wu | SWORS: A System for the Efficient Retrieval of Relevant Spatial Web Objects | Proceedings of the VLDB Endowment 5(12) | (PR)(CO) |

Thesis

| | | | | | |
|-----|------|----------------------------|---|-----|------------|
| T1 | 2007 | I. Brudaru | Heuristics for Average Diameter Approximation with External Memory Algorithms | MPI | MS Thesis |
| T2 | 2007 | G. Moruz | Hardware-Aware Algorithms and Data Structures | AU | PhD Thesis |
| T3 | 2008 | M. Patrascu | Lower Bound Techniques for Data Structures | MIT | PhD Thesis |
| T4 | 2008 | A. Sidiropoulos | Computational metric embeddings | MIT | PhD Thesis |
| T5 | 2008 | D. Ajwani | Traversing large graphs in realistic settings | MPI | PhD Thesis |
| T6 | 2008 | K. Do Ba | Testing closeness of distributions under the EMD metric | MIT | MS Thesis |
| T7 | 2008 | K. Lai | Complexity of Union-Split-Find Problems | MIT | MS Thesis |
| T8 | 2008 | J. M. Larsen og M. Nielsen | En undersøgelse af algoritmer til løsning af generalized movers problem i 3D | AU | MS Thesis |
| T9 | 2008 | C. Andersen | An optimal minimum spanning tree algorithm | AU | MS Thesis |
| T10 | 2008 | M. Revsbæk | I/O-efficient Algorithms for Batched Union-Find with Dynamic Set Properties and its Applications to Hydrological Conditioning | AU | MS Thesis |

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|-----|------|-----------------------|--|-----|------------|
| T11 | 2008 | A. H. Jensen | I/O-efficient Processing of LIDAR Data | AU | MS Thesis |
| T12 | 2009 | M. Olsen | Link Building | AU | PhD Thesis |
| T13 | 2009 | T. Mølhave | Handling Massive Terrains and Unreliable Memory, AU | AU | PhD Thesis |
| T14 | 2009 | H. B. Kirk | Searching with Dynamic Optimality: In Theory and Practice | AU | MS Thesis |
| T15 | 2009 | K. Piatkowski | Implementering og udvikling af maksimum delsum algoritmer | AU | MS Thesis |
| T16 | 2009 | O. Weimann | Accelerating Dynamic Programming | MIT | PhD Thesis |
| T17 | 2009 | V. Weichert | Radiation parameterization of the climate model COSMO/CLM in CUDA | FRA | MS Thesis |
| T18 | 2009 | R. Berinde | Advances in Sparse Signal Recovery Methods | MIT | MS Thesis |
| T19 | 2009 | P. Davoodi | Two Dimensional Range Minimum Queries | AU | MS Thesis |
| T20 | 2009 | K. Tsakalidis | External Memory 3-sided Planar Range Reporting and Persistent B-Trees | AU | MS Thesis |
| T21 | 2009 | L. Deleuran | Polygonal Line Simplification | AU | MS Thesis |
| T22 | 2010 | A. G. Jørgensen | Data Structures: Sequence Problems, Range Queries, and Fault Tolerance | AU | PhD Thesis |
| T23 | 2010 | J. Moeslund | Fine-resolution geospatial modelling of contemporary and potential future plant diversity in Denmark | AU | MS Thesis |
| T24 | 2010 | J. Truelson | Working Set Implicit Dictionaries and Range Mode Lower Bounds and Approximations | AU | MS Thesis |
| T25 | 2010 | M. Greve | Online Sorted Range Reporting and Approximating the Mode | AU | MS Thesis |
| T26 | 2010 | D. Kjær | Range Media Algorithms | AU | MS Thesis |
| T27 | 2010 | J. Suhr Christensen | Experimental Study of Kinetic Geometric t-Scanner Algorithms | AU | MS Thesis |
| T28 | 2011 | K. G. Larsen | Optimal Orthogonal Range Reporting in 3-d | AU | MS Thesis |
| T29 | 2011 | C. Kejlberg-Rasmussen | On Implicit Dictionaries with the Working-Set Property and Catenable Priority Queues with Attrition | AU | MS Thesis |
| T30 | 2011 | P. Davoodi | Data Structures: Range Queries and Space Efficiency | AU | PhD Thesis |
| T31 | 2011 | K. Tsakalidis | Dynamic Data Structures: Orthogonal Range Queries and Update Efficiency | AU | PhD Thesis |
| T32 | 2011 | J. Nelson | Sketching and Streaming High-Dimensional Vectors | MIT | PhD Thesis |

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|-----|------|-------------------|---|-----|------------|
| T33 | 2012 | J. E. Moeslund | The role of topography in determining local plant diversity patterns across Denmark | AU | PhD Thesis |
| T34 | 2012 | F. van Walderveen | External Memory Graph Algorithms and Range Searching Data Structures | AU | PhD Thesis |
| T35 | 2012 | L. Deleuran | Homotopic Polygonal Line Simplification | AU | PhD Thesis |
| T36 | 2012 | C. Neumann | Practical Paging Algorithms | FRA | MS Thesis |
| T37 | 2012 | D. Veith | Implementation of an External-Memory Diameter Approximation | FRA | MS Thesis |
| T38 | 2012 | M. Sturmman | k-Dimensionale Orthogonale Bereichsanfragen für GPUs auf großen Instanzen | FRA | MS Thesis |
| T39 | 2012 | P. Wollstadt | A Graph Algorithmic Approach to Separate Direct from Indirect Neural Interactions by Identifying Alternative Paths with Similar Weights | FRA | BS Thesis |
| T40 | 2012 | E. Deza | An efficient implementation of the optimal paging algorithm | FRA | BS Thesis |
| T41 | 2012 | T. Morgan | Map Folding | MIT | MS Thesis |
| T42 | 2012 | R. Gupta | A Compressive Sensing Algorithm for Attitude Determination | MIT | MS Thesis |
| T43 | 2012 | A. Koefoed-Hansen | Representations for Path Finding in Planar Environments | AU | MS Thesis |

Other

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|----|------|--|---|---|----------|
| O1 | 2008 | E. Demaine, B. Gassend, J. O'Rourke, and G. T. Toussaint | All Polygons Flip Finitely ... Right? | In "Surveys on Discrete and Computational Geometry: Twenty Years Later", Contemporary Mathematics 453 | (CO) |
| O2 | 2008 | A. Andoni and P. Indyk | Near-Optimal Hashing Algorithms for Approximate Nearest Neighbor in High Dimensions | Communications of the ACM, 51(1) | (CO) |
| O3 | 2008 | K. Mehlhorn and P. Sanders | Algorithms and Data Structures: The Basic Toolbox | Springer Verlag | (CO) |
| O4 | 2009 | D. Ajwani and U. Meyer | Design and Engineering of External Memory Traversal Algorithms for general graphs | In Algorithmic of Large and Complex Networks, Springer Verlag | (PR) |
| O5 | 2009 | L. Arge and N. Zeh | External-memory Algorithms and Data Structures | In Algorithms and Theory of Computation Handbook, CRC Press | (PR)(CO) |
| O6 | 2009 | R. Hearn and E. Demaine | Games, Puzzles, and Computation | A.K. Peters | (CO) |

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|-----|------|--|--|---|------|
| O7 | 2010 | D. Ajwani and H. Meyerhenke | Realistic Computer Models | In Algorithm Engineering. Bridging the Gap Between Algorithm Theory and Practice, Springer Verlag | (CO) |
| O8 | 2011 | H. Balslev, L. Arge, J.-C. Svenning, M. H. Schierup and C. S. Jensen | Abstracts of Royal Danish Academy of Sciences Symposium on Biodiversity in the Silicon Age | | (CO) |
| O9 | 2012 | L. Arge and K. G. Larsen | I/O-Efficient Spatial Data Structures for Range Queries | Invited abstract in SIGSPATIAL Special, July, 2012. | |
| O10 | 2012 | B. Sandel, L. Arge, B. Dalsgaard, R.G. Davies, K.J. Gaston, W.J. Sutherland and J.-C. Svenning | Response - Global endemism needs spatial integration | Science 335 | (CO) |

| Personel | | Hiring period in 2012 **) | Financing (fraction of year *) | | | Foreign employee | For PhD and Post Doc: Previous education | For PhD: Finished degree |
|-------------------------------------|---------------------|---------------------------|--------------------------------|-----|----------------------|------------------|--|--------------------------|
| Name | Position | | Foundation | AU | Other financing ***) | | | |
| Centerleder | | | | | | | | |
| Lars Arge (AU) | Professor | all period | 0,1 | 0,9 | | | | |
| Faculty | | | | | | | | |
| Gerth S. Brodal (AU) | Associate Professor | all period | | 1 | | | | |
| Christian S. Jensen (AU) | Professor | 01.03- | | 0,8 | | | | |
| Peyman Afshani (AU) | Assistant Professor | 15.03- | | 0,8 | | | | |
| Piotr Indyk (MIT) | Professor | all period | 0,1 | | 0,1 | x | | |
| Erik Demaine (MIT) | Professor | all period | 0,1 | | 0,1 | x | | |
| Kurt Mehlhorn (MPI) | Professor | all period | | | 0,1 | x | | |
| Ulrich Meyer (FRA) | Professor | all period | | | 0,2 | x | | |
| Brody Sandel (AU) | Assistant Professor | all period | 0,2 | | 0,8 | x | PhD | |
| Qin Zhang (AU) | Post Doc | -31.07 | 0,6 | | | x | PhD | |
| Elad Verbin (AU) | Post Doc | -31.07 | 0,2 | | 0,4 | x | PhD | |
| Lap-Kei Lee (AU) | Post Doc | -31.03 | 0,3 | | | x | PhD | |
| Cicimol Alexander (AU) | Post Doc | all period | | | 1 | x | PhD | |
| Wei Yu (AU) | Post Doc | all period | | | 1 | x | PhD | |
| Constantinos Tsirogiannis (AU) | Post Doc | all period | 0,2 | | 0,8 | x | PhD | |
| Hossein Jowhari (AU) | Post Doc | 01.04- | 0,8 | | | x | PhD | |
| Zhewei Wei (AU) | Post Doc | 01.09- | 0,3 | | | x | PhD | |
| Darius Sidlauskas (AU) | Post Doc | 20.08- | 0,3 | | | x | PhD | |
| Gabriel Moruz (FRA) | Post Doc | all period | | | 1 | x | PhD | |
| Christian Sommer (MIT) | Post Doc | -31.12 | | | 1 | x | PhD | |
| Guests | | | | | | | | |
| Djamel Belazzougui | Post Doc | 01.02-01.07 | 0,1 | | 0,3 | x | PhD | |
| Stijn Koopal | MS student | 27.08- | | | 0,3 | x | | |
| Libor Sarga | MS student | 01.09- | | | 0,3 | x | | |
| Tehnicial staff | | | | | | | | |
| Mathias Rav | Programmer | all period | 1 | | | | | |
| Administrative staff | | | | | | | | |
| Else Magård | Center manager | all period | 0,5 | 0,5 | | | | |
| Ellen Lindstrøm | Accountant | all period | | 0,5 | | | | |
| Matie Bach Søgaaard | Student assistant | all period | | 1 | | | | |
| Ph.d.-studerende | | | | | | | | |
| Lasse Deleuran (AU) | PhD student | -17.09 | | | 0,8 | | BS + 1 year | x |
| Jesper Erenskjold Moeslund (AU) | PhD student | -17.12 | | | 1 | | BS + 1 year | x |
| Freek van Walderveen (AU) | PhD student | -31.07 | 0,2 | 0,4 | | x | MS | x |
| Morten Revsbæk (AU) | PhD student | all period | | 1 | | | MS | |
| Jacob Truelsén (AU) | PhD student | 01.08- | | 0,4 | | | BS + 1 year | On leave in 2011 |
| Kasper G. Larsen (AU) | PhD student | all period | 0,2 | 0,8 | | | BS | |
| Casper Kejlberg-Rasmussen (AU) | PhD student | all period | 0,2 | 0,8 | | | BS | |
| Vaida Ceikute (AU) | PhD student | all period | | 1 | | x | MS | |
| Jesper Asbjørn Sindahl Nielsen (AU) | PhD student | all period | | | 1 | | BS + 1/2 year | |
| Anders Skovsgaard (AU) | PhD student | all period | | 1 | | | MS | |
| Jungwoo Yang (AU) | PhD student | 01.03- | 0,8 | | | x | MS | |
| Bryan Wilkinson (AU) | PhD student | 01.08- | | 0,4 | | x | MS | |
| Andreas Beckmann (MPI/FRA) | PhD student | all period | 0,2 | | 0,8 | x | MS | |
| Andrei Negoescu (MPI/FRA) | PhD student | all period | | | 1 | x | MS | |
| Volker Weichert (MPI/FRA) | PhD student | all period | | | 1 | x | MS | |
| David Veith (MPI/FRA) | PhD student | 01.03- | 0,8 | | | x | MS | |
| Khan Do Ba (MIT) | PhD student | -30.06 | | | 0,5 | x | BS | x |
| Eric Price (MIT) | PhD student | all period | | | 1 | x | BS | |
| Morteza Zadimoghaddam (MIT) | PhD student | all period | 0,3 | | 0,7 | x | BS | |
| Ludwig Schmidt (MIT) | PhD student | 01.01- | 0,1 | | 0,9 | x | BS | |
| Haitam Hassanieh (MIT) | PhD student | 01.10- | 0,3 | | 0,7 | x | BS | |

*) Approximation. Max one decimal.

**) More than three weeks.

***) Including no financing.