madalgo
CENTER FOR MASSIVE DATA ALGORITHMICS

AARHUS UNIVERSITY

Danmarks Grundforskningsfond
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ANNUAL REPORT 2011

CENTER FOR MASSIVE DATA ALGORITHMICS

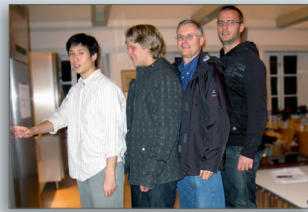## 2011 Highlights

Research team

At the end of 2011 the center research team consisted of six senior researchers (2 at AU), ten Postdocs (7 at AU) and sixteen PhD students (10 at AU). Additionally, one further Postdoc and four PhD students (3 of which obtained PhD degrees during the year) were part of the center in 2011. All center Postdocs are internationals and so are a good deal of the PhD students.

Research collaboration and results

In 2011 MADALGO researchers published 72 peer reviewed research paper 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 2011. The center also has extensive multidisciplinary and industry collaboration.

A *priority queue* is a fundamental data structure used in many efficient algorithms. The structure maintains a set of object under updates, such that the highest priority element can be reported at all times.

In 2011 MADALGO researchers closed a longstanding and fundamental open problem by developing a comparison based meldable priority queue supporting all but deletion of an object in constant time.

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 High-Dimensional Geometric Computing in 2011, where five international experts lectured for around 60 participants (mostly PhD students) from 29 institutions in 14 nations. The school was organized in collaboration with the Sino-Danish Center for the Theory of Interactive Computation (CTIC), with which the center also organized an international workshop on Synergies in Lower Bounds. Together with eco- and bio- informatics researchers, the center also organized a Royal Danish Academy of Science and Letters symposium entitled "Biodiversity in The Silicon Age". Finally, the center organized the Third Workshop on Massive Data Algorithmics, in connection with Symposium on Computational Geometry in Paris, France.

In 2011 center researchers also gave numerous presentations at international research conferences, as well as more than 35 invited presentations at research conferences, workshops and seminars.

Awards and acknowledgments

Center researchers received a number of awards and acknowledgments in 2011.

Center Director Arge was elected member of the Danish Academy of Technical Sciences, and center senior researchers Demaine and Indyk were promoted to MIT full professors. Center senior researcher Mehlhorn won the ACM Paris Kanellakis theory and practice award, and senior researcher Meyer won the German innovation price along with center PhD student Beckmann. Center PhD student Larsen received an elite travel scholarship from the Danish minister of research. Larsen also won the best paper award at the top theoretical computer science conference *IEEE Symposium on Foundations of Computer Science.*

Content

This report describes the 2011 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 2011 accounts for the center with appendices (as well as the original center research plan and previous yearly reports) are also important in order to obtain a complete overview of the 2011 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 31, 2012

Lars Arge
Center Director

1 Center background and organization

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 and Arge 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 been quite stable during 2011. Scientifically, the center continues to be led by center director Lars Arge along with the other core 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, with secretarial support from the Department of Computer Science. Starting in the summer of 2011, the Department also supports the center with student assistant Matie Bach Søgaard. Two part time student programmers have also been associated with the center in 2011. During 2011 the main center site at AU moved to a large newly constructed extension to the Department of Computer Science and is now co-located with the related database group (which officially joined the center on March 1, 2012), as well as the mathematical computer science and cryptography and security groups that hosts the Sino-Danish Center for the Theory of Interactive Computation (CTIC) also funded by the Danish National Research Foundation. On the research personnel side, the center Post Doc and PhD student population has developed more or less as anticipated (refer to section 5). During 2011 the center also continued its faculty member recruitment efforts and managed to hire Peyman Afshani as an Assistant Professor (with a March 1, 2012 start date and a promise of advertisement of an Associate professor within a three year period).

2 Center research

The original center research plan discussed a number of main research challenges in the center focus research areas of *I/O-efficient*, *cache-oblivious* and *streaming* algorithms and in *algorithm engineering*. Results and new challenges in these areas – as well as several new directions (methodologies/models) for massive data processing – have been discussed in the previous annual reports. In general, 2011 was a busy year with steady progress on problems in to both the original research plan and the new directions areas. Below we *briefly* discuss *some* of the obtained results. Since the center has recently finalized a new 5 year contract with the foundation containing an extensive 2011-2017 research plan, we will not go into details about research plan modifications.

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 continued to make progress on problems in relation to the areas outlined in the research plan.

In terms of *geometric data structures*, we have obtained results on several variants of range reporting, that is, the problem of storing a set of d-dimensional points such that the points in an axis-aligned query hyper-box can be reported efficiently. For example, we studied a one-dimensional sorted range reporting variant, where the input points have weights and where a query asks for the k points with smallest weight in the query range [C157]. We provided an efficient data structure for the version of the problem where the k points should be reported in weight order. We also showed that the structure is nearly optimal and that it is the requirement that the points are reported in sorted order that makes the problem hard. In a paper recently presented at the 2012 Symposium on Discrete Algorithms, we have also e.g. studied a one-dimensional version of the problem where the points have colors and a query asks for points of certain colors, as well as a two-dimensional version where the points are places on a grid. In both cases we provided optimal solutions. At the same conference we also presented a paper with a so-called fully persistent B-tree structure for the one-dimensional version of the problem, where the current as well as all previous versions of the data structure are maintained under insertions and deletions of points (even in previous versions of the structure), such that queries can be answered efficiently on any version of the structure.

In the area of *terrain data processing* we have continued our work on problems in relation to modeling of water flow. We will discuss this work further in the algorithm engineering section below. We have also worked on the problem of I/O-efficiently extracting and simplifying contour lines (maps) from massive terrain models. Our (yet unpublished) simplification algorithm guarantees that the contour lines in the simplified map are nested as in the original map. Previous algorithms work on individual contours (polygonal lines) and do not provide the nesting guarantee.

We have also continued to work on I/O-efficient *graph algorithms* and e.g. obtained results on topological sorting various graph classes [C163] and on approximating the diameter of a graph. The latter results will be presented at the upcoming Workshop on Parallel systems and Algorithms. Recently, we also applied I/O-efficient graph algorithms techniques to social network analysis problems and obtained the first I/O-efficient algorithms for computing the so-called betweeness centrality of each node in a network (along with new improved I/O-efficient diameter algorithms). Betweeness centrality is a fundamental measure of the importance of nodes in a social network.

In 2011 we also worked extensively on *paging algorithms*, that is, algorithms that perform I/Os for algorithms that are not explicitly designed with I/O in mind. We have e.g. described improved algorithms for computing what data to output when they need to make room for new input [C158]. We have also introduced a way of formalizing "easy" access patterns that occur in practice and designed algorithms that handle these efficiently. A paper with these results was presented at the recent Symposium on Discrete Algorithms.

Cache-oblivious algorithms

Cache-obliviousness provides an elegant framework for obtaining algorithms for multi-level memory hierarchies. However, the techniques to obtain cache-oblivious algorithms and data structures and the limitations of the framework are still poorly understood. Thus in 2011 the center has continued to focus on fundamental data structure questions. While we have not made as much progress as we would have liked, we hope the hiring of Afshani (who has obtained several results in the area) will increase our productivity.

During the year, we have obtained results on the fundamental *dictionary* problem, that is, the problem of maintaining a collection of elements such that they can be updated and searched efficiently. We have developed a dictionary that simultaneously is implicit (does not use any space beyond the space for storing the elements) and where searches satisfy the working-set property (where access to recently accessed elements are faster than accesses to not so recently accessed elements). Previously, a structure (also developed by center researchers) was only known to have the working-set property for successful searches. A paper with the result was recently presented at Symposium on Theoretical Aspects of Computer Science. We have also made progress on the two- and three-dimensional *range reporting* by both showing an improved lower bound on the space needed for optimal range reporting data structures, and substantially reducing the size of cache-oblivious data structures for several special cases [C156].

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 2011 we have continued our work on fundamental streaming problems and general streaming algorithm design techniques as outlined in the research plan.

We have e.g. obtained a number of results in relation to computing various *statistics* of the elements in a stream. For the well-studied problem of estimating the Lp norms (under insertions and deletions), we have presented algorithms that use the same space as the previously best known algorithms, but runs substantially faster [C175]. Moreover, for the particular case of the L2 norm, we have shown how to obtain results using a simple dimensionality reduction approach that is applicable in a wide range of scenarios. Specifically, in a paper recently presented at Symposium on Discrete Algorithms we showed that one can achieve a well-known dimensionality reduction due to Johnson and Lindenstrauss in very little time (and using little randomness) [176]. The reduction randomly projects a vector x (e.g. representing the data stream) into a lower-dimensional space while approximately preserving the L2 norm of x with high probability. This in turn allows us to compute an approximation to the L2 norm efficiently. Apart from statistics computation, we have also considered a number of other specific streaming problems. For example, we have shown lower bounds for the amount of space needed to estimate *sorting-by-reversal distance* [C167], and designed improved algorithms for *cycle counting* [C169] and *edit distance computation* [C162].

In 2011, we have also continued our study of the problem of *sparse recovery,* 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 focused on the recovery of a sparse approximation to x, that is, 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 algorithms for sparse recovery problems where some information about the input vector x is available. For example, we have designed new algorithms for the case where the non-zero coefficients of x are known to occur near each other [C170] and for the case where we know the approximate locations of large coefficients [C177]. We have also designed a new algorithm for sketching images consisting of a small number of local geometric features (e.g., stars) [C173]. In all cases we obtained shorter sketches than previous, as well as improved running times. Finally, we have also provided

the first known sparse recovery scheme under the Earth Mover Distance, a basic metric widely used in computer vision [C171]. The entries of a sketch Ax of x are often referred to as the linear measurements of x, and the above results all assume that the linear measurements of x are non-adaptive, i.e., are done all at once in parallel. The question is if it is possible to design better (i.e., shorter) sketches if the linear measurements are allowed to be adaptive. In this case, the measurements are chosen in rounds, and the choice of the measurements in each round depends on the outcome of the measurements in the previous rounds. Surprisingly, the answer to this question is positive. Specifically, during 2011 we have shown that (for small k) one can obtain an exponential improvement in the number of measurements required to extract k non-zero coefficients of x by allowing the measurements to be adaptive [C172,C174].

Algorithm engineering

Algorithm engineering covers the design and analysis of practical algorithms, efficient implementation of these algorithms, as well as experimentation that provide insight into their applicability and further improvements. In 2011 we have made progress in most of the algorithm engineering areas discussed in the original research plan, as well as in a few others.

In terms of *library development*, we have been working on a redesign of the TPIE library for implementation of I/O-efficient algorithms in order to improve its efficiency (and e.g. allow better pipelining of subsequent scans of the same data). We have also continued our work on engineering I/O-efficient *graphs algorithms* in connection with the topological sorting [C163] and diameter approximation results discussed in the I/O-efficient algorithms section above. We have also used experimental techniques in work on bounding the average-case complexity of some classical shortest-path algorithms [C168]. In terms of *terrain data processing* engineering work, we have for example experimented with flow and watershed computation on terrains represented by triangulations [C151,C152]. Previously, most of our experimental terrain work has been on the simpler grid terrain representation. We have also implemented a modified version of the I/O-efficient contour map simplification algorithm described above, and are currently experimenting with it.

As discussed in previous annual reports, much of our previous engineering work on massive terrain data processing – most noticeably the TerraSTREAM software package – is being commercialized through the startup company SCALGO. During 2011 SCALGO released several software packages based on the TerraSTREAM software. A new flash flood mapping product that identifies when depressions in the terrain fill during rainfall was also launched and is being marketed by COWI in Denmark (under the name "skybrudskort®"). Very recently, a national flood tool ("havvand på land") was launched on the portal klimaportalen.dk run by the Danish ministry for the environment. The tool visualizes the flooded area for a (user-) given sea-level rise and is based on computations performed by SCALGO.

Our massive terrain data algorithms engineering work (including the SCALGO software) is also at the core of our expanding multidisciplinary collaboration with biology researchers (described further in Section 3). In 2011 the collaboration for example led to results on how I/O-efficient algorithms and software enable global and precise hydrological analysis at an unprecedented resolution. A paper with these results is to be submitted to Nature geosciences. It also e.g. led to a Science paper on climate-change velocity's influence on small-ranged species [J34] and a paper on the relationship between vegetation and elevation in salt meadows across Denmark and implications for sea-level rise impacts [J33].

New direction areas

We have continued our work in several new massive dataset areas that was identified and discussed in previous annual reports, as well as in the second center period research plan.

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 shown how the I/O-efficient algorithm technique called distribution sweeping can be modified to the parallel setting and used to solve various geometric problems on axis-aligned objects [C153]. We have also worked on establishing the theoretical foundation of the *MapReduce framework* introduced by Google in order to simplify the design of algorithms for large clusters of independent but interconnected machines. We have shown how algorithms described in the parallel so-called PRAM and BSP models of computation can be simulated in the MapReduce framework and obtained efficient algorithms for several fundamental and geometric problems [C154]. Recently, we have also considered *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 for estimating the number of distinct elements and for identifying heavy hitters. These results will appear at Symposium on Theory of Computing and at Symposium on Principles of Database systems in May 2012. Finally, we have also obtained results in a *distributed asynchronous shared memory model* [C181].

Unlike in the parallel and distributed areas, we did not make much progress on developing theoretical models and algorithms for *flash memory* in 2011. However, we did make progress in the area of *faulty-memory algorithms*, that is, algorithms that work correctly even under memory faults. We have e.g. extended the range of data structures that can be made fault-tolerant to arrays, linked lists, binary search trees, interval trees, predecessor search, and suffix trees [C188]. In the area of *succinct data structures*, that is, data structures that are very space-efficient, we have obtained improved results on both so-called cardinal trees and counter data structures [C161,C166]. Recently, we have also considered succinct range minimum data structures. We have also obtained several results in the very restrictive implicit (succinct) model, where all data structure information is encoded in a permutation of the input data (that is, where no space beyond the space for storing the input data is used). As mentioned in the cache-oblivious section above, we have obtained results on dictionaries where searches satisfy the working-set property. We have also studied dictionaries with movable fingers (that allow for fast search close to a finger), and obtained tradeoffs between query time and the time needed to move a finger.

As discussed in earlier years' annual reports, much of our work is "crosscutting" in the sense that it involves ideas from several areas or combines the various models/methodologies we consider. Another crosscutting "theme" that has emerged in the center is an emphasis on data structure. Much of the center work in the various models described above is on data structuring problems. We have also considered data structure problems in more classical models of computation. In particular, we have obtained and published numerous results on range reporting variants [C147,C149,C150,C159,C160] and several other range reporting results (on e.g. categorical and higher-dimensional data, and on range diameter and range mode queries) are under submission. The results include two papers authored by center PhD student Larsen that show very strong lower bound tradeoffs between query and update time for several range reporting variants. The papers received the best student paper award, and will receive the best paper (and best student paper) award(s) at the two top theoretical computer science conferences Symposium on the Foundation of Computer Science and Symposium on Theory of Computing, respectively. Apart from results on the classical range reporting problem (and other data structure problems), we have also closed a longstanding classical and fundamental open problem by developing a comparison based (pointer machine model) meldable priority queue (a fundamental structure that maintains a set of object under updates, such that the highest priority element can be reported at all times) supporting all but deletion of an object in constant time. This result is also to be presented at the upcoming Symposium on Theory of Computing.

3 Collaboration

The center continues to try to maintain a vibrant and international environment at the main center site, e.g. through emphasis on hosting international visitors (faculty as well as PhD students) at AU. Almost all senior MIT, MPI and FRA faculty have visited AU during 2011, and all FRA and many MIT PhD-students and Post Docs have also visited. Additionally, non-center faculty Moshe Lewenstein (Bar-Ilan University) and Kostas Tsichlas (Aristotle University of Thessaloniki) visited AU for a longer period of time in 2011. The list of shorter term non-center researchers visiting AU include Andrew McGregor, (Massachusetts, Amherst), Riko Jacob (TU Munich), Thomas Mølhave (Duke), Andy Brodnik (Primorska), Alex López-Ortiz (Waterloo), Francesco Silvestri (Padova), Jeff Erickson (UIUC), Asano Tetsuo (JAIST), Raphaël Clifford (Bristol), Nati Linial (Hebrew), Aaron Archer (AT&T Research), Alexandr Andoni (Microsoft Research), Ken Clarkson (IBM Research), along with PhD students Philipp Hupp and Gero Greiner (TU Munich), Jiangwei Pan and Sze-Hang Chan (Hong Kong), and Tine Šukljan (Primorska). The center also has strong collaboration (e.g. through joint events and Post Docs Verbin and Yu) with the CTIC center, just as collaboration with database researcher Professor Christian S. Jensen and his group is intensifying.

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 Biology, 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 researches 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, CiGIR now has two Post Docs based at biology (Sandel and Alexander) and one based at the center (Tsirogiannis). The Post Docs spend at least one day a week at the other site than their base. As mentioned, the collaboration has already resulted in several papers. Other center multidisciplinary collaborations include a project with the State Library in Aarhus (joint advising of PhD student Sindahl). The center is also still exploring collaborations in connection with the truly massive data that will be generated by the future FAIR and ESS physics experiments. Other industry

collaborations include a project with Draper Lab on compressive sensing for astronomical imaging and a project with Lufthansa Systems concerning flight route optimization.

4 Events

During 2011 the center participated in and/or organized a large number of research events. These included internal weekly seminars at AU, a retreat for center employees (which in 2011 e.g. featured talk on flight route optimization by Swen Schlobach for Lufthansa Systems and on presenting scientific results to the public by Lars Mathiasen from Swift & Gelinde), as well as a number of workshops. Externally, center researchers gave numerous presentations at international research conferences, as well as gave more than 35 invited presentations at research conferences, workshops and seminars. Center researchers have also participated in several public outreach activities. Brodal has for example lectured on how Google works and on algorithms in general at several high-school related events.

Following the success of the first and second *Workshop on Massive Data Algorithmics* (MASSIVE) in 2009 and 2010, the center organized a third workshop in connection with *Symposium on Computational Geometry* (as in previous years) in Paris. Building on the success of the three first MASSIVE workshops, the center is planning to co-located the 2012 workshop with the much broader algorithms conference *ALGO*. 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 *high-dimensional geometric computing* in 2011, where five international experts lectured for around 60 participants from 29 different institutions in 14 countries. The 2011 summer school was organized in collaboration with the CTIC center, and the two centers also co-organized a workshop on *synergies in lower bounds*, which featured 13 speakers and was attended by 50 researchers and students from 21 institutions in 16 countries. Together with eco- and bio-informatics researchers, the center also organized a Royal Danish Academy of Science and Letters symposium on "Biodiversity in the silicon age". The very successful symposium brought together 57 biologist and computer scientist to discuss collaboration possibilities [O8]. Finally, center staff was also involved in the organization of a number of other international events, including ALGO 2011, a Bertinoro workshop and a Bellairs workshop.

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 10 Post Docs (7 at AU, all internationals). Six of these Post Docs were hired in 2011. Simak Tazari (PhD Humboldt 2010) and Christian Sommer (PhD Tokyo 2010) where hired at MIT, and Lap-Kei Lee (PhD Hong Kong 2009), Cicimol Alexander (PhD Leicester 2010), Wei Yu (PhD Tsinghua 2010) and Constantinos Tsirogiannis (PhD Eindhoven 2011) at AU. As mentioned in Section 3, Alexander is a biology Post Doc and Tsirogiannis a computer science Post Doc both working in the multidisciplinary CiGIR project, and Yu is a joint Post Doc with the CTIC center working on a number of issues on the boundary between the two centers. Lap-Kei Lee is mainly working on issues in relation to the center core research area of streaming. Previously he was a Post Doc at MPI with center core faculty Mehlhorn. Tazari and Sommer at MIT both have broad interest in center research areas. Post Doc Nodari Sitchinava left in 2011 after two years at the center to take up another Post Doc position at Karlsruhe Institute of Technology.

Currently, the center houses 18 PhD students (12 at AU, 3 internationals). Two of these PhD students joined MADALGO in 2011 and one in 2012 (all at AU): Jesper Asbjørn Sindahl Nielsen (with Brodal as advisor), Anders Skovsgaard (with Jensen as advisor) and Jungwoo Yang (with Arge as advisor). Jelani Nelson (MIT with Demain and Indyk as advisors), Pooya Davoodi and Kostas Tsakalidis (both with Brodal as advisor) finished their PhDs in 2011. Nelson and Davoodi are now Post Docs at MSRI (Princeton) and NYU, respectively, while Tsakalidis is still searching for a Post Doc position. Nelson will join the faculty at Harvard after the MSRI Post Doc. AU PhD students Moeslund, Larsen and Van Walderveen spent approximately a semester abroad in 2011 at ETH, Princeton and Dalhousie, respectively.

As discussed in previous annual reports, we believe the centers Post Doc and PhD student recruitment efforts have been relatively successful, although we would like to recruit more international PhD students. 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; in 2011 three 5 ECTS classes on streaming algorithms, Markov chain Monte Carlo algorithms, and R for macroecology, respectively. Finally, the center continues to emphasize initiatives designed to create as 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 number of social events.

Appendix to the Annual Report

Section A: External Relations

Please list collaborations and state subject and output where relevant.

List **includes** relevant collaboration for AU as well as MIT, MPI and FRA researchers in 2011

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
Norbert Zeh (Dalhausie), Canada	I/O-efficeint, cache-oblivious and parallel algorithms	Publications		X		
BNR A/S	GIS in traffic management				X	
COWI A/S (incl. Kristian Keller, Johnny Koust Rasmussen, Michael Schultz Rasmussen, Jeppe Sikker Jensen), Denmark	Terrain algorithms and software	Publications and software			X	
Jan Vahrenhold (TU Dortmund), Germany and Andrew Danner (Swarthmore College), USA	TPIE	TPIE software package		X		
Eiva A/S, Denmark	Sonar data algorithms and software	Publication and software			X	
Scalable Algorithmics (SCALGO), Denmark	I/O-efficient terrain algorithms and software	Software			X	
Thomas Mølhave (Duke), USA	I/O-efficient terrain algorithms and software	Publications and Software		X		
Mike Goodrich (UC Irvine), USA	I/O-efficient and parallel algorithms	Publication		X		
Pankaj K. Agarwal (Duke University), USA	Approximate algorithms and data structures, I/O-efficient terrain algorithms	Publications		X		
Peder Klith Bøcher, Jens-Christian Svenning (Institute of Biological Sciences, AU), Tommy Dalgaard, Faculty of Agricultural Sciences and Bettina Nygaard, National Environmental Research Institute (NERI), Denmark	Collaborators and co-advisors of PhD student Jesper Erenskjold Moeslund	Publications	X			

Peyman Afshani (Dalhousie), Canada	Skylines and Uncertain Data, Orthogonal Range Searching, List ranking lower bounds, and MapReduce	Publications		X			
Niklaus Zimmermann and Achilleas Psomas (WSL), Schweiz	Remote sensing data and vegetation	Publication		X			
Timothy M. Chan (Waterloo), Canada	Orthogonal Range Searching, Range Mode in Arrays	Publications		X			
Mihai Patrascu (AT&T), USA	Orthogonal Range Searching	Publication					X
Rasmus Pagh (ITU), Denmark	Colored Range Searching	Publication	X				
Stephane Durocher, Jason Morrison (Manitoba), Bryan T. Wilkinson (Waterloo), Canada	Range Mode in Arrays	Publication		X			
Huy L. Nguyen (Princeton), US	Range Searching Lower Bounds	Publication		X			
Bo Dalsgaard, Bill Sutherland (Cambridge), Richard Davies, (East Anglia), Kevin Gaston (Exeter), UK	Long-term climate stability and patterns of species distributions and diversity	Publication		X			
Jason Fridley (Syracuse), USA	Plant phylogenetic diversity	Publication		X			
Jeffrey Corbin (Union College), Monica Krupa (UC Davis), USA	Plant functional traits and restoration	Publication		X			
Francesco Silvestri (Padova), Italy, Kostas Tsichlas (Thessaloniki), Greece	Algorithms for MapReduce			X			
Michiel Smid (Carleton), Canada	Range diameter reporting	Publication		X			
Jeff M. Phillips (Utah), USA	Approximate algorithms and data structures, streaming algorithms	Publications		X			
Mark de Berg and Herman Haverkort (TU Eindhoven), The Netherlands	Geometric algorithms and data structures	Publications and Software		X			
Martijn van Leusen (Groningen), Philp Verhagen (Vrije), The Netherlands	Geomorphometric Algorithms for Archaeological Applications			X			

Mohammad Ali Abam (TU Dortmund), Germany, Shervin Daneshpajouh, Mohammad Ghodsi (Sharif), Iran	Line simplification	Publications		X		
Srinivasa S. Rao (Seoul National University), South Korea and Vineet Pandey (BITS Pilani), India	Space efficient and external memory data structrues	Publications		X		
Andrej Brodnik (Primorska), Solvenia	Processing of massive geometric data	Grant		X		
Kostas Tsichlas, Apostolos N. Papadopoulos (Thessaloniki), Spyros Sioutas (Ionian), Alexis Kaporis (Patras), Greece	External Memory Persistence and Rang searching	Publication		X		
George Lagogiannis (Athens), Greece and Robert E. Tarjan (Princeton & HP), USA	Data Structures	Publication		X		X
David P. Woodruff (IBM Research), USA	Distributed functional monitoring	Publication				X
Zengfeng Huang and Ke Yi (HKUST Hong Kong), China	Randomized Algorithms for Tracking Distributed Count, Frequencies, and Ranks	Publication		X		
Ho-Leung Chan, Tak-Wah Lam, Hing-Fung Ting (HKU, Hong Kong), China	Streaming algorithms	Publications		X		
Sze-Hang Chan, Tak-Wah Lam, Chi-Man Liu, Hing-Fung Ting, Ho-Leung Chan, Jianqiao Zhu (HKU, Hong Kong), China	Scheduling	Publications		X		
Moshe Lewenstein (Bar Ilan University), Israel	Pattern matching in data stream			X		
Bjarne Andersen (Statsbiblioteket, Aarhus), Denmark	SCAPE - Scalable Preservation Environments				X	
S. Srinivasa Rao (Seoul National University), South Korea	Range minimum queries, succinct representations of Cartesian trees, path minima queries, succinct representations of cardinal trees	Publication		X		

Rajeev Raman, (University of Leicester), UK, Moshe Lewenstein (Bar Ilan University), Israel	Range minimum queries, succinct representations of trees				X		
George Lagogiannis, Kostas Tsichlas (Thessaloniki), Greece	Dynamic Connectivity, Dynamic Upper Envelope of parallel segments, samt Concatenable Priority Queues with Attritions				X		
Christos Makris (Patras), Greece	Optimal Search Trees				X		
Raphael Clifford (Bristol), UK	Communication Complexity and Streaming Algorithms				X		
Shubhangi Saraf and Swastik Kopparty (Rutgers), USA	Complexity and Lower Bounds				X		
John Steinberger (Tsinghua), China	Cryptography Lower Bounds				X		
Deepak Ajwani (University College Cork), Ireland	I/O-efficient algorithms, Top-K range reporting, Flash Memory, and parallel memory-cache algorithms	Publications			X		
Martin Loffler (UC Irvine), USA	Range selection and median	Publication			X		
Xiaoming Sun, Chengu Wang and S. Chen (Tsinghua University), China	Lower bounds	Publications			X		
Rolf Fagerberg (University of Southern Denmark), Christian Nørgaard Storm Pedersen, Thomas Mailund (Aarhus University, Bioinformatics Research Center), Denmark	Computing Common Oriented Triplets in Evolutionary Trees				X		
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		
Group of Riko Jacob (TU Munich), Germany	High-Performance Matrix operations using GPUs				X		
David Woodruff (IBM Almaden), USA	Streaming algorithms	Publication					X
Yaron Rachlin (Draper Lab), USA	Compressive sensing	Publication					X
Ragu Meka (Texas), USA	Dimensionality reduction	Publication			X		
Daniel Kane (Harvard & Stanford), USA	Several topics	Publications			X		
Ely Porat (Bar Ilan), Israel	Fast Moment Estimation in Data Streams in Optimal Space	Publication			X		
Shay Mozes (Brown University), USA	Exact Distance Oracles for Planar Graphs	Publication			X		
Ken-ichi Kawarabayashi (National Institute of Informatics), Japan	Distance oracles	Publications			X		
Philip Klein (Brown), USA	Approximation schemes in planar and H-minor-free graphs				X		
Stephan Kreutzer (TU Berlin), Germany	Logic and structural graph theory, directed graphs	Publication			X		
Lukas Moll (Humboldt University Berlin), Germany, Marc Thurley (Bellaterra), Spain	Hypergraph width measures	Publication			X		
Oswin Aichholzer, Franz Aurenhammer (TU Graz), Austria, Ferran Hurtado (Politecnica de Catalunya), Spain, Pedro Ramos (Alcala), Jorge Urrutia (Nacional Autonoma de Mexico), Mexico	On k-convex polygons	Publication			X		
Mashhood Ishaque, Andrew Winslow (Tufts), USA	One-Dimensional Staged Self-Assembly	Publication			X		

Anna Lubiw (Waterloo), Canada, Andrew Winslow (Tufts), USA	Algorithms for Solving Rubik's Cubes	Publication		X		
Greg Aloupis,Vida Dujmovic (McGill), Canada, John Iacono (Polytechnic Inst. NYU), USA	Meshes preserving minimum feature size	Publication		X		
MohammadTaghi Hajiaghayi (Maryland), USA, Ken-ichi Kawarabayashi (National Inst. Informatics), Japan	Contraction Decomposition in H-Minor-Free Graphs and Algorithmic Applications	Publication		X		
Sandor Fekete (TU Braunschweig), Gunter Rote (FU Berlin), Nils Schweer (TU Braunschweig), Daria Schymura (FU Berlin), Mariano Zelke (Frankfurt), Germany	Integer Point Sets Minimizing Average Pairwise L_1 Distance: What is the Optimal Shape of a Town?	Publication		X		
MohammadTaghi Hajiaghayi (Maryland), USA, Hamid Mahini (Sharif), Iran	The Price of Anarchy in Network Creation Games	Publication		X		
Andre Schulz (Munster), Germany	Embedding Stacked Polytopes on a Polynomial-Size Grid	Publication		X		
Stefan Langerman (U. Libre de Bruxelles), Belgium	Confluently Persistent Tries for Efficient Version Control	Publication		X		
Vi Hart (SUNY Stony Brook), USA, Anna Lubiw (Waterloo), Canada, Tomohiro Tachi, Shinji Imahori (Tokyo), Takehiro Ito (Tohoku), Masashi Kiyomi (JAIST), Ryuhei Uehara (JAIST), Takeaki Uno (National Inst. Informatics), Japan, Jean Cardinal, Stefan Langerman (Bruxelles), Belgium	Folding	Publications		X		

Nicholas J. A. Harvey (Waterloo), Canada, Christos H. Papadimitriou (Berkeley), USA, Martha Sideri (Athens), Greece, Ryuhei Uehara (JAIST), Yushi Uno (Osaka), Takehiro Ito (Tohoku), Japan	On the Complexity of Reconfiguration Problems	Publication		X		
Hee-Kap Ahn, Sang Won Bae, Wanbin Son (POSTEC), South Korea, Matias Korman (Bruxelles), Belgium, Iris Reinbacher (TU Braunschweig), Germany	Covering points by disjoint boxes with outliers	Publication		X		
Jean Cardinal, Samuel Fiorini, Gwenael Joret, Stefan Langerman (Bruxelles), Belgium, Ilan Newman (Haifa), Oren Weimann (Weizmann), Israel	The Stackelberg Minimum Spanning Tree Game	Publication		X		

Section B: Conferences

a) Please list the number of conferences, symposia, seminars etc. the Center has arranged or participated in the planning of b) Please list the number of times the Center has been invited to talk at international conferences.

List includes 2011 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)
Workshop on Synergies in Lower Bounds
Summer School on High-Dimensional Geometric Computing
Royal Danish Academy of Sciences and Letters Symposium on Biodiversity in the Silicon Age
ALGO Conference
Bertinoro Workshop on Sublinear Algorithms
Bellairs Winter Workshop on Computational Geometry

b) Invited Talks

Title of event	Venue	Name(s) of participant(s)
Seminar	Copenhagen University	Sandel
European Symposium on Algorithms	MPI Saarbrucken, Germany	Arge
Workshop on Hot Trends in Computer Science	KAUST, Saudi Arabia	Arge
Seminar	Pohang University of Science and Technology, South Korea	Arge
Seminar	Korean Advanced Institute of Science and Technology, South Korea	Arge

Seminar	LIAFA, Université Paris Diderot, France	Brodal
Seminar	University of Ljubljana, Slovenia	Brodal
Seminar	University of Primorska, Slovenia	Brodal
Seminar	IT University of Copenhagen	Zhang
Seminar	LIAFA, Université Paris Diderot, France	Zhang
Erice Summer School on Graph Theory, Algorithms and Applications	Erice, Italy	Mehlhorn
ICALP Workshop on Graph algorithms and Applications	ETH, Zurich	Mehlhorn
WALCOM Workshop	Delhi, India	Mehlhorn
Coding, Complexity and Sparsity Workshop	University of Michigan, USA	Indyk, Price
Theory Colloquium	Microsoft New England, USA	Indyk
Center for Information and System Engineering Colloquium	Boston University, USA	Indyk
Seminar	University of Massachusetts at Amherst, USA	Indyk
Seminar	National University of Singapore,	Indyk
Tech Talk	Google Moscow, Russia	Indyk
ISL Colloquium	Stanford University, USA	Indyk
Workshop on Sensing and Analysis of High-Dimensional Data	Duke University, USA	Indyk, Price
IMA Annual Program Year Workshop on High Dimensional Phenomena	University of Minnesota, USA	Indyk
Analysis of Algorithms Conference	Bedlewo, Poland	Indyk
Seminar	Microsoft Research, USA	Nelson

Seminar	IBM Almaden Research Center, USA	Nelson
Seminar	Yale University, USA	Nelson
Workshop on Sublinear Algorithms	Bertinoro, Italy	Nelson
Seminar	Chinese University, Hong Kong	Nelson
MSRI Workshop on Quantitative Geometry in Computer Science	Berkeley, USA	Nelson
Seminar	Harvard University, USA	Nelson
Seminar	University of Maryland, USA	Demaine
Martin Gardner Celebration of Mind	Boston, USA	Demaine
Symposium on String Processing and Information Retrieval	Pisa, Italy	Demaine
Seminar	Fields Institute, Canada	Demaine
Spanish Meeting on Computational Geometry	Alcala de Henares, Spain	Demaine
Seminar	Museum of Mathematics, New York, USA	Demaine
Seminar	University of British Columbia, Canada	Demaine

Section C: Educational activities

Please list all educational activities the Center contributed to, including PhD-courses, courses at master- and bachelor-level. Also list summer schools and courses taught abroad. Please state ECTS points (if possible) and length of the course (in hours).

List only **includes** 2011 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 2011	5	28
BSc course: Algorithms and Data Structures 2. Spring 2011	5	28
BSc course: Computer Science in Perspective. Fall 2011		20
MSc course: I/O-efficient algorithms. Spring 2011	10	42
MSc course: Advanced Data Structures. Fall 2011	10	42
PhD course: Markov Chain Monte Carlo, Spring 2011	5	21
PhD Course: R for Macroecology. Spring 2011	5	30
PhD course: Streaming Algorithms. Spring 2011	5	24
DM Programming Contest Coaching		
NWERC Programming Contest Coaching		
Course on algorithms for highschoolers in Addis Ababa, Ethiopia		160

Please list the number of Master Graduates and Bachelor Graduates supervised at the Center.

Number of Master Graduates	Number of Bachelor Graduates
8	2

Section D: External funding

Please list all external funding obtained by the Center Leader or Center Members. List the total amount and the partial amount allocated to the reported year.

List **only includes** information for AU employees; it includes all active/new funding in 2011.

	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	~60.000
	Danish Minister of Research	EliteForsk Travel scholarship	AU (Larsen)	2011-2013	300000	~250.000
	State Library	PhD Fellowship	AU (Brodal and Nielsen)	2011-2015	~1000000	~500.000
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
International funds	US Army Research Office	STREAM: Scalable Techniques for High Resolution Elevation Data Analysis and Modeling	Duke University, NCSU, and AU (Arge)	2009-2011	~2.800.000	?
	Google	European Doctoral Fellowship	Dept. of Computer Science, AU (Arge and Larsen)	2010-2013	~1.000.000	
	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	?

Section E: Awards

Please list awards and prizes the Center Leader or Center Members have recieved in the reported year.

List **includes** relevant 2011 information for AU as well as MIT, MPI and FRA researchers.

Awards	Recipient	Granted amount in DKK, if relevant
The Machtey Award (FOCS Best Student Paper Award)	Larsen	
EliteForsk Travel scholarship	Larsen	300.000
Elected member of Danish Academy of Technical Sciences	Arge	
ACM Paris Kanellakis Theory and Practice Award	Mehlhorn	
German innovation price "Selected landmark" for the Ecosort project	Beckmann and Meyer	
George M. Sprowls Award for the best doctoral theses in computer science at MIT	Nelson	

Section F: Public outreach

Please list public outreach activities in electronic media, press, high schools, etc .

List **only includes** 2011 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
Science Magazine Podcast, News and Decoded	Interview	Climate-change velocity and species endemism	Sandel
Videnskab.dk	Feature	Climate-change velocity and species endemism	Arge, Sandel, Svenning
Videnskab.dk	News	DNRF awardes MADALGO another 5 years	Arge
eliteforsk.dk	News	EliteForsk award to Larsen	Larsen

b) Press

Specific media (newspapers, journals, magazines, other)	Type of communication (interview, commentary, debate, feature, etc.)	Subject	Contributor from the Center
New Scientist	Interview	Climate-change velocity and species endemism	Sandel
Nature News	Interview	Climate-change velocity and species endemism	Sandel
Yale Environment 360	Interview	Climate-change velocity and species endemism	Sandel
DK4	Television portrait	Eliteforskerne	Arge
Århus Stiftstidende	Feature	EliteForsk award	Larsen
Dagbladet Ringkøbing-Skjern	Feature	EliteForsk award	Larsen
Viborg Stifts Folkeblad	Feature	EliteForsk award	Larsen

c) Other

Specific type of communication (presentation/lecturing at open university, high school, etc.)	Subject	Contributor from the Center
Group exercises	Introduction to Algorithms to High School students	Brodal
Lecture "UNF Aarhus"	How Google works	Brodal
Lecture "UNF Copenhagen"	How Google works	Brodal
Lecture "Verdens kedeligste foredrag", TÅGEKAMMERET, Aarhus University	Binary Counters	Brodal

Section G: Patents and applications

List the number of inventions reported to institution, submitted patent applications, granted patents etc. gained by the Center in reported year. Also list possible spin-off companies and collaborations/partners.

List **only includes** 2011 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	Names of spin-off companies established

Section H: Publications

Please enclose, in a seperate appendix, a full publication list including all authors dating back from the center start. Divide the list in types of publications including conference proceedings as well as master and PhD theses authored by Center Members. List only accepted publications. If the publication has been peer reviewed please note in brackets "PR". Also note in brackets "CO" if the publication is co-authored by non-Center Members.

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

Total number of publications in	Peer reviewed	Not peer reviewed
Number of journal articles	26	0
Number of conference proceedings	46	3
Number of monographs	0	0
Number of book chapters	0	0
Others	0	6

List the 10 most prestigious publication sources within the Center's research area and prioritize.

Conferences

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 Randomizationand Computation (RANDOM)
9. Scandinavian Workshop on Algorithm Theory (SWAT)/Workshop on Algorithms and Data Structures (WADS)
10. Workshop on Algorithm Engineering and Experiments (ALENEX)

Journals

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

State information regarding any bibliometric analyses about the Center.

Distribution of center publications on 10 most prestigious conferences:

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

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 388 unique authors - 55 associated with the center and 355 not.
Only 80 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

Section I: Publication list

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)
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 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. Malinger, 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)
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)
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	20009	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	
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. Tsichlas	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. Tsichlas	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)
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)
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)
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)
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 Langauges (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. Tsichlas 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)

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. Kjærgaard 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)
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. Loffler 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+eps)-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)

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. Gavoille 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. Schardl and I. Shapiro-Ellowitz	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)
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)

Journals

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)
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. Guttag	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)

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)
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. Wuhrer	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)

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
T11	2008	A. H. Jensen	I/O-efficient Processing of LIDAR Data	AU	MS Thesis
T12	2009	Martin Olsen	Link Building	AU	PhD Thesis
T13	2009	Thomas Mølhave	Handling Massive Terrains and Unreliable Memory, AU	AU	PhD Thesis
T14	2009	Henrik B. Kirk	Searching with Dynamic Optimality: In Theory and Practice	AU	MS Thesis
T15	2009	Krzysztof Piatkowski	Implementering og udvikling af maksimum delsum	AU	MS Thesis
T16	2009	O. Weimann	Accelerating Dynamic Programming	MIT	PhD Thesis
T17	2009	Volker 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. Truelsen	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-Spanner Algorithms	AU	MS Thesis
T28	2011	K. G. Larsen	Optimal Orthogonal Range Reporting in 3-d	AU	MS Thesis
T29	2011	Casper 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

Other

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)
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)

| Personel | | Hiring period in 2011 **) | Finansing (fraction of year) *) | | | Forign employee | For PhD and Post Doc: Previous education | For PhD: Finished degree |
Name	Position		Foundation	AU	Other finan-sing ***)			
Centerleder								
Lars Arge (AU)	Professor	all period	0,1	0,9				
Faculty								
Gerth S. Brodal (AU)	Associate Professor	all period		1				
Piotr Indyk (MIT)	Associate Professor	all period	0,1		0,1	x		
Erik Demaine (MIT)	Associate Professor	all period	0,1		0,1	x		
Kurt Mehlhorn (MPI)	Professor	all period			0,1	x		
Ulrich Meyer (FRA)	Professor	all period			0,3	x		
Nodari Sitchinava (AU)	Post Doc	- 31.08	0,7			x	M.Eng., PhD	
Brody Sandel (AU)	Post Doc	all period			1	x	PhD	
Qin Zhang (AU)	Post Doc	all period	1			x	PhD	
Elad Verbin (AU)	Post Doc	all period	0,4		0,6	x	PhD	
Lap-Kei Lee	Post Doc	01.04-	0,8			x	PhD	
Cicimol Alexander	Post Doc	01.06-			0,6	x	PhD	
Wei Yu	Post Doc	08.08-			0,4	x	PhD	
Constantinos Tsirogiannis	Post Doc	01.09-	0,3			x	PhD	
Gabriel Moruz (FRA)	Post Doc	all period			1	x	MS, PhD	
Christian Sommer (MIT)	Post Doc	01.09-			0,3	x	MS, PhD	
Siamak Tazari (MIT)	Post Doc	all period			1	x	PhD	
Guests								
Moshe Lewenstein	Associate Professor	01.09-30.09	0,1			x		
Kostas Tsichlas	Associate Professor	01.05-31.10			0,5	x		
Tehnical staff								
Thor Siiger Prentow	Programmer	-31.10	0,8					
Mathias Rav	Programmer	01.09-	0,3					
Administrative staff								
Else Magård	Center manager	all period	1					
Ellen Lindstrøm	Accountant	all period		0,5				
Matie Bach Søgaard	Student assistant	01.06-		0,6				
Ph.d.-studerende								
Lasse Deleuran (AU)	PhD student	all period	0,7		0,3		BS + 1 year	
Kostas Tsakalidis (AU)	PhD student	-31.07	0,6			x	BS + 1 year	x
Jesper Erenskjold Moeslund (AU)	PhD student	all period	0,3		0,7		BS + 1 year	
Morten Revsbæk (AU)	PhD student	01.02-	0,8	0,1			Cand. Scient	On leave in 2010
Mark Greve (AU)	PhD student	-31.01	0,1				BS + 1 year	On leave
Pooya Davoodi (AU)	PhD student	-30.04	0,3			x	MS	x
Jacob Truelsen (AU)	PhD student						BS + 1 year	On leave
Kasper G. Larsen (AU)	PhD student	all period	1				BS	
Casper Kejlberg-Rasmussen (AU)	PhD student	all period	1				BS	
Freek van Walderveen (AU)	PhD student	all period			1	x	MS	
Vaida Ceikute (AU)	PhD student	all period	1			x	MS	
Jesper Asbjørn Sindahl Nielsen (AU)	PhD student	01.02-			0,9		BS + 1/2 year	
Anders Skovsgaard (AU)	PhD student	01.08-		0,4			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	
Khan Do Ba (MIT)	PhD student	all period			1	x	BS	
Jelani Nelsen (MIT)	PhD student	-30.06			0,5	x	MS	x
Eric Price (MIT)	PhD student	all period			1	x	BS	
Morteza Zadimoghaddam (MIT)	PhD student	all period			1	x	BS	

*) Approximation. Max one decimal.
**) More then three weeks.
***) Including no financing.