

Karim Douïeb – Curriculum Vitae

40 Av. Jean Dubrucq
1080 Bruxelles

karim.douieb@gmail.com
Phone:+32 485 437797

Born: 19 October 1982
Nationality: Belgian

Profile

I am a young researcher in computer science expert in the domain of data structures and algorithms. I did a Phd at the Free University of Brussels followed by a postdoctoral fellowship of two years at Carleton University, Ottawa, Canada. I have now a solid background in research. This allows me to come up with elegant solutions to any type of algorithmic problems and quickly prototyping them (in C++ or Java). I am also specialized in improving the speed of algorithm/programs as well as reducing their space requirement.

Lately I developed a high interest in analytics. I worked as a software engineer and statistician in an audit company specialized in the verification of online advertising located in the heart of the city in London. I have successively applied my academic knowledge to the improvement and the development of their business intelligence department.

Education

PhD in Computer Science 2004–2008
Université Libre de Bruxelles

Phd Thesis title: “Hotlinks & Dictionaries”.

My research is mainly focused on the design and analysis of advanced data structures and algorithms. In my thesis I developed efficient *self-adjusting* data structures (that adapt themselves over the time) to store and retrieve any kind of information. The advantage of such data structures is that they guarantee faster access to important information and automatically figure out by themselves which is the most important information (this is usually not known in advance). They also allow a faster access to the information related to the information that has been recently accessed, preserving some sort of locality in the information. The majority of the results obtained in my thesis have been implemented and tested practically in C++.

DEA in Computer Science 2004–2005
(Diplôme d’Etude Approfondie en sciences) Université Libre de Bruxelles

MSc Computer Science, *1st class honour* 2000–2004
(Licence en informatique, Grande distinction) Université Libre de Bruxelles

Academic & Professional Experiences

Software Engineer/Statistician October 2010–August 2011
Telemetry Ltd.
Tower 42, 25 Old Broad St, London, UK

Telemetry is an audit company specialized in the verification of online advertisement. It collects and stores large amount of information characterizing the usage of each individual advertisement that they monitor. This represents a tremendous and complex amount of data. My role in the company is to analyze the data they own: extract any relevant patterns using a wild range of statistical tools then find meaningful insights that allow a better understanding of the data. The aim of this process is to transform digital data into business intelligence, summarize the nature of it and give it a new narrative. Another important task was to effectively convey ideas and key-aspects of our analysis by communicating them into a graphical and intuitive way (data visualization).

Post Doctoral Fellow
Carleton University
School of Computer Science, Ottawa, Canada

October 2008–August 2010

My role in the research group at Carleton University was to use my expertise in data structures and algorithms to solve some challenging algorithmic problems. I actively worked with all their members and quickly became a valuable element in their group. They also gave me the important task of supervising their graduated students. We succeeded at solving all type of problems in computational geometry, data compression, networking and data structure. These results have been published and presented in top conferences and journals (see my list of publications below).

Computing Skills

Programming Languages: Expert in C/C++, Java, PHP, HTML, L^AT_EX, Processing 1.0 and familiar with MATLAB, R, XML, CSS.

Expertise: Data structures, algorithms, analytics, computational geometry and complexity analysis.

Operating Systems: Unix, OSX, Windows.

Awards & Grants

Nominated for the 2009 IBM Belgium prize for
the best thesis in computer science

October 2009

F.R.I.A.-F.N.R.S Doctoral Scholarship
(Fonds National de la Recherche Scientific)

2004–2008

Languages

French: speaking (native), reading (native), writing (native)

English: speaking (fluent), reading (fluent), writing (fluent)

Dutch: speaking (basic), reading (basic), writing (basic)

Teaching Experience

INFO-f-206: TP Informatique facultaire, 2007 (ULB)

INFO-f-206: TP Informatique facultaire, 2006 (ULB)

INFO-f-206: TP Informatique facultaire, 2005 (ULB)

Publications

Journal:

– P. Bose, M. Damian, K. Douïeb, J. O'Rourke, B. Seamone, M. Smid and S. Wuhler. $\pi/2$ -Angle Yao Graphs are Spanners. Accepted for publication in the *International Journal of Computational Geometry and Applications (IJCGA)*. Special issue of selected papers from ISAAC 2010.

– P. Bose, K. Douïeb, V. Dujmović and J. Howat. Layered Working-Set Trees. Accepted for publication in *Algorithmica*.

– P. Bose, K. Douïeb and P. Morin. Skip Lift: An Probabilistic Alternative to Red-Black Trees. Accepted for publication in *Journal of Discrete Algorithms*. Special issue of selected papers from the 21st International Workshop on Combinatorial Algorithms (IWOCOA 2010).

– P. Bose, K. Douïeb, J. Howat and P. Morin. Fast Local Searches and Updates in Bounded Universes. Accepted for publication in *Computational Geometry: Theory and Applications (CGTA)*.

Special issue of selected papers from the 22nd Canadian Conference on Computational Geometry (CCCG 2010).

– K. Douïeb and S. Langerman, Near-Entropy Hotlink Assignments (extended version), In *Algorithmica*, Volume 58(2), pages 221–244, 2010.

– K. Douïeb and S. Langerman. Dynamic Hotlinks. In *Algorithmica*, volume 50(2), pages 208–222, 2008. Special issue of selected papers from the 9th Workshop on Algorithms and Data Structures (WADS 2005).

Conference:

– K. Douïeb, M. Eastman, A. Maheshwari and M. Smid. Approximation Algorithms for a Triangle Enclosure Problem. Accepted for publication in *the 23rd Canadian Conference on Computational Geometry (CCCG 2011)*.

– P. Bose and K. Douïeb. Should Static Search Trees Ever Be Unbalanced? In *Proceedings of the 18th Annual European Symposium on Algorithms (ISAAC 2010)*, volume 1, pages 109–120.

– P. Bose, M. Damian, K. Douïeb, J. O’Rourke, B. Seamone, M. Smid and S. Wührer. $\pi/2$ -Angle Yao Graphs are Spanners. In *Proceedings of the 18th Annual European Symposium on Algorithms (ISAAC 2010)*, volume 2, pages 446–457.

– G. Aloupis, P. K. Bose, S. Collette, E. Demaine, M. Demaine, K. Douïeb, V. Dujmović, J. Iacono, S. Langerman and P. Morin. Common Unfoldings of Polyominoes and Polycubes. In *Proceedings of the China-Japan Joint Conference on Computational Geometry, Graphs and Applications (CGGA 2010)*.

– P. Bose, K. Douïeb, J. Howat and P. Morin. Fast Local Searches and Updates in Bounded Universes. In *Proceedings of the 22nd Canadian Conference on Computational Geometry (CCCG 2010)*, pages 261–264.

– P. Bose, K. Douïeb and P. Morin. Skip Lift: An Probabilistic Alternative to Red-Black Trees. Accepted for publication in *Proceedings of the 21st International Workshop on Combinatorial Algorithms (IWOCA 2010)*.

– P. Bose, K. Douïeb, V. Dujmović and Rolf Fagerberg. An $O(\log \log n)$ -Competitive Binary Search Tree with Optimal Worst-Case Access Times. In *Proceedings of the 12th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2010)*, volume 6139 of LNCS, pages 38–49, 2010.

– P. Bose, K. Douïeb, V. Dujmović and J. Howat. Layered Working-Set Trees. In *Proceedings of the 9th Latin American Theoretical Informatics Symposium (LATIN 2010)*, volume 6034 of LNCS, pages 686–696, 2010.

– P. Bose and K. Douïeb. Efficient Construction of Near-Optimal Binary and Multiway Search Trees. In *Proceedings of the 11th International Symposium on Algorithms and Data Structures (WADS 2009)*, volume 5664 of LNCS, pages 230–241, 2009.

– P. Bose, K. Douïeb and S. Langerman. Dynamic Optimality for Skip Lists and B-trees. In *Proceedings of the 19th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2008)*, pages 1106–1114, 2008.

– K. Douïeb and S. Langerman. Near-Entropy Hotlink Assignments. In *Proceedings of the 14th Annual European Symposium on Algorithms (ESA 2006)*, volume 4168 of LNCS, pages 292–303, 2006.

– K. Douïeb and S. Langerman. Dynamic Hotlinks. In *Proceedings of the 9th Workshop on Algorithms and Data Structures (WADS 2005)*, volume 3608 of LNCS, pages 182–194, 2005.

Technical report:

– P. Bose, L. Devroye, K. Douïeb, V. Dujmović, J. King and P. Morin. Odds-On Trees. (Available at <http://arxiv.org/abs/1002.1092>)

– P. Bose, L. Devroye, K. Douïeb, V. Dujmović, J. King and P. Morin. Point Location in Disconnected Planar Subdivisions. (Available at <http://arxiv.org/abs/1001.2763>)

PhD Thesis:

– *Hotlinks and Dictionaries*. Université Libre de Bruxelles, 2008. Committee: Prosenjit Bose, Gerth Brodal, Jean Cardinal, Sébastien Collette, Samuel Fiorini, Stefan Langerman (thesis director) and Ian Munro.

Advanced Courses Attended

Mathematical Writing in English, November-December, 2007, Brussels (ULB), Belgium.

Minicourse on Algorithmic Game Theory, March 20 – 23, 2007, Eindhoven (TU/e), The Netherlands.

Spring School of EuroCG '05, March 07– 08, 2005, Eindhoven (TU/e), The Netherlands

Talks, Visits and Workshop

Stringmasters Workshop, July 29-31, 2010, King's College, London, United Kingdom

Winter Workshop on Computational Geometry, February 5-12, 2010, Holetown (McGill U.), Barbados

Visiting researcher at NYU, September 28 - October 2nd, 2009, New-York, USA

Talk: Should Static Search Trees Ever Be Unbalanced?

Korean Workshop on Computational Geometry, June 21-26, 2009, JAIST, Kanazawa, Japan

Carleton Workshop on Computational Geometry 09, May 4-8, 2009, Ottawa (Gatineau), Canada

WAFOL 09, March 19-21, 2009, Brussels (ULB), Belgium

BWAR 08, April 14-18, 2008, Brussels (ULB), Belgium

Carleton Computational Geometry Lab Seminars, August 18, 2007, Ottawa, Canada

Talk: Dynamic optimality for skip lists and B-trees.

Visiting researcher at Carleton University, August 2007, Ottawa, Canada

Carleton Computational Geometry Lab Seminars, August 15, 2006, Ottawa, Canada

Talk: New results on hotlinks.

Visiting researcher at Carleton University, August 2006, Ottawa, Canada

Referee for

CCCG, SWAT, SoCG, ACM Transactions on Algorithms, Discrete Applied Math, IPL, J. of Discrete Algorithms, Algorithmica, Journal of Experimental Algorithmics.

Miscellany

Film photography: Image, developing and printing. Portfolio at www.AtyPICS.be