Oguz Kaya

LIP ENS Lyon, 46 Allée d'Italie 69007 Lyon, France
oguz.kaya@ens-lyon.fr, +33 06 89 98 51 43
www.oguzkaya.com

EDUCATION

Ph.D., Computer Science
ROMA Team, Laboratoire de l'Informatique du Parallélisme (LIP)
École Normale Supérieure de Lyon, Lyon, France - September 2017 (Expected)

M.S., Computational Science and Engineering
Georgia Institute of Technology, Atlanta, GA - August 2014

B.S., Computer Science
Bilkent University, Ankara, Turkey - May 2010

RESEARCH INTERESTS

Parallel and High Performance Computing

- High performance parallel sparse tensor computations in shared and distributed memory environments
- Parallel sparse direct solvers for emerging HPC architectures
- Load balancing and partitioning methods for parallel algorithms

Combinatorial Scientific Computing

- Combinatorial problems in sparse tensor computations
- Fill-reducing ordering methods for sparse direct solvers
- Graph/hypergraph partitioning-based models and their applications to sparse linear/multilinear algebra problems

Theoretical Computer Science

- Design and complexity analysis of combinatorial algorithms

WORK EXPERIENCE

Software Engineering Intern June 2014 - September 2014
Philanthropy Engineering Team
Palantir Technologies Inc., Palo Alto, US

- Worked as a full-stack software engineer in a philanthropy project which aims to end homelessness in 25 major US cities. Performed the front-end and back-end design and implementation using state-of-the-art HTML 5.0 technologies (Backbone / Backbone-forms / Marionette / Less / Handlebars) and Java.
- Developed (in Groovy/Java) a software to automatically migrate a Salesforce database into the Palantir platfrom with incremental database updates.

Research Intern May 2013 - December 2013
cuSPARSE CUDA Sparse Matrix Library and Algorithms Team
NVIDIA, Santa Clara, US

- Developed (in C++) parallel sparse direct solver for shared and distributed memory environments.
- Developed (in C++) partitioning and coarsening routines for GPU-based parallel algebraic multigrid solver (AmgX).

Visiting Researcher Summer 2012
École Normale Supérieure de Lyon, Lyon, France

- Designed and implemented (in C and MATLAB) a hybrid fill-reducing ordering algorithm.
- Developed (in C) hypergraph partitioning-based fill-reducing ordering methods.

Research Assistant August 2011 - May 2013
Georgia Institute of Technology, Atlanta, US
- Developed (in C) graph algorithms for DARPA ADAMS (Anomaly Detection at Multiple Scales) project to detect insiders threats within a corporate database of computer usage activity.

Research Assistant January 2011 - August 2011
Georgia Institute of Technology, Atlanta, US
- Developed (in C and MATLAB) ordering methods for ILU preconditioners.

Software Engineer in Test Summer 2008
HAVELSAN A.S., Ankara, Turkey
- Implemented (in Java) test tools for validating messaging among various modules of the software infrastructure of an aircraft design.

SOFTWARE

HyperTensor
A high performance parallel sparse tensor factorization library

- Supports shared (OpenMP) and distributed memory (MPI) parallelism for sparse Tensor factorization.
- Provides PaToH interface for effective tensor partitioning.
- Implemented in C++11.

TEACHING EXPERIENCE

Teaching Assistantship Fall 2009
Algorithms and Programming II
Bilkent University, Ankara, Turkey

Teaching Assistantship Summer 2008
Algorithms and Programming I
Bilkent University, Ankara, Turkey

Assistant Coach Summer 2005
Summer School for National Olympiads in Informatics
Middle East Technical University, Ankara, Turkey

ADDITIONAL EXPERIENCE

Senior Design Project Fall 2009 - Spring 2010
- Using state-of-the-art information retrieval algorithms, developed and implemented (in Java) a news recommender system to automate news selection for the front pages of online news portals.

TECHNICAL SKILLS

Programming Languages: C, C++, MATLAB, Java, Groovy, Javascript, C#, R, Python, HTML/CSS, MySQL, Verilog, Assembly
Libraries: OpenMP, MPI, NVIDIA CUDA, Intel Cilk+, Backbone.js, Backbone-forms, Marionette, Less, Handlebars

HONORS AND AWARDS

- Awarded SIAM Student Travel Award for the SIAM PP'16 Conference, Paris, France, 2016.
- Awarded INRIA CORDI-FRM Scholarship (2014-2017), Inria, France, 2014.

- Awarded the best senior project prize: *havadiSec: A news recommendation system for the front pages of news portals*, Bilkent University, 2010.
- High Honor Student, Bilkent University, 2005 - 2010.
- Awarded National and Bilkent University Scholarships, 2005 - 2010.
- Ranked 38th in University Admissions Exams among 2M students, 2005.
- Awarded bronze medal in the *International Olympiads in Informatics (IOI)*, Novy Sacz, Poland, 2005.
- Awarded bronze medal in the *National Olympiads in Informatics*, Ankara, Turkey, 2004.
- Ranked 2nd in the *Regional Olympiads in Informatics*, Istanbul, Turkey, 2004.

PUBLICATIONS

[1] **Oguz Kaya** and Bora Uçar. "High performance parallel algorithms for the Tucker decomposition of sparse tensors". *The International Conference on Parallel Processing (ICPP16)* (%21.2 acceptance).

[2] **Oguz Kaya** and Bora Uçar. "Scalable sparse tensor decompositions in distributed memory systems". *The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC15)* (%22 acceptance).

[3] Ted Senator, +33 more authors. "Detecting insider threats in a real corporate database of computer usage activity". In the *Proceedings of the* 19^{th} *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (2013).

[4] Emre Varol, Fazli Can, Cevdet Aykanat, and **Oguz Kaya**. "CoDet: Sentence-based containment detection in news corpora". In the *Proceedings of the 20th ACM International Conference on Information and Knowledge Management* (2011).

TECHNICAL REPORTS

[1] **Oguz Kaya** and Bora Uçar. "High performance parallel algorithms for the Tucker decomposition of higher order sparse tensors". Technical Report.

[2] **Oguz Kaya**, Enver Kayaaslan, Bora Uçar, and Iain Duff. "Fill-in reduction in sparse matrix factorization using hypergraphs". Technical report.

[3] **Oguz Kaya**, Enver Kayaaslan, and Bora Uçar. "Minimum quasi-clique edge cover and vertex partition problems are NP-hard". Technical report.

TALKS

[1] "High performance parallel tucker decomposition of sparse tensors". *SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP'16), Paris, France - April 2016.*

[2] "Parallel sparse tensor decompositions in distributed memory systems". *Workshop on Tensor Decompositions and Applications, Leuven, Belgium - January 2016.*

[3] "Scalable sparse tensor decompositions in distributed memory systems". *Sparse Days in St. Girons, St. Girons, France - July 2015*, *Journée de Calcul ENS Lyon, Lyon, France - September 2015*, *Supercomputing '15, Austin, TX USA - November 2015.*

[4] "The role of hypergraph partitioning in sparse matrix computations". *Georgia Institute of Technology, Atlanta, GA USA - April 2013*, *NVIDIA, Santa Clara, CA USA - June 2013.*

PROFESSIONAL MEMBERSHIPS

SIAM student member
ACM student member
ACM SIGHPC member

SELECTED COURSES

Advanced Classical Probability, Statistical Methods, Numerical Linear Algebra, Iterative Methods, Automata and Formal Languages, Algorithms, Computability and Algorithms, Randomized Algorithms, Computational Science and Engineering Algorithms, Computational Geometry, Parallel Computing, Introduction to High Performance Computing, High Performance Computing: Tools and Applications, Modeling and Simulation, Object-Oriented Software Engineering, Operating Systems, Database Management Systems