Abdurrahman Yaşar

CONTACT

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EDUCATION

Georgia Institute of Technology, USA, PhD. Computer Science — 2015 - 2021 (Expected)
Advisor; Ümit V. Çatalyürek
Dissertation: Towards Performance Portable Graph Algorithms

Bilkent University, Turkey, MSc. Computer Engineering — 2013 - 2015
Advisor; Buğra Gedik
Dissertation: Scalable Layout of Large Graphs on Disk

Galatasaray University, Turkey, B.Sc. Computer Engineering — 2007 - 2012

SUMMARY

Ph.D. Candidate in Computer Science. Research interest in large-scale graph mining and processing. Seeking full time employment starting May'21.

HONORS & AWARDS

- Travel Award: SIAM Conference on Parallel Processing for Scientific Computing — 2020
- Two of the MIT/Amazon/IEEE HPEC 2018 Graph Challenge Innovation Awards — 2019
- Travel Award: SIAM Conference on Computational Science and Engineering — 2019
- One of the four invited students to Chesapeake Large-Scale Analytics Conference — 2018
- One of the MIT/Amazon/IEEE HPEC 2018 Graph Challenge Champions — 2018
- Excellence Study Grant Provided by the Embassy of France in Turkey — 2013
- First Grade, Galatasaray University — 2012
- Special Jury Award, Team ONGUN, IBM Software Academy, Turkey — 2012
- Galatasaray Education Foundation (GEV) Bachelors Degree Fellowship — 2008

EXPERIENCE

Georgia Institute of Technology, College of Computing, Atlanta GA — Aug. 2015 -
Graduate Research Associate

Sandia National Laboratories, Albuquerque NM — May.-Aug'18 and May.-Aug'19
Graduate Summer Intern

IBM Almaden Research Center, San Jose CA — May. 2016 - Aug. 2016
Graduate Summer Intern

Inria - Lille Nord Europe, Equipe DART, Lille France — May. 2011 - Sep. 2011
Summer Intern

RESEARCH

Data/Computation Partitioning

Balanced distribution of the computation and the data to the processors is a crucial step for efficient parallelism. Towards my PhD. I studied different partitioning strategies.

- Efficient spatial partitioning techniques to speed up irregular problems.
- Computation space partitioning strategies to reduce the algorithmique complexity.
- Layout techniques to increase memory utilization.

A Novel Subgradient-based Method for d-Dimensional Rectilinear Partitioning — 2020
submitted to IEEE International Parallel & Distributed Processing Symposium (IPDPS)
M. F. Balin, X. An, **A. Yaşar**, L. Song and Ü. V. Çatalyürek

On Symmetric Rectilinear Matrix Partitioning — 2020
submitted to SIAM Journal on Scientific Computing (SISC)
A. Yaşar, M. F. Balin, X. An, K. Sancak and Ü. V. Çatalyürek

Distributed block formation and layout for disk-based management of large-scale graphs — 2017
Distributed and Parallel Databases (DPDS)
A. Yaşar, B. Gedik, H. Ferhatosmanolu

Graph Mining & Block-based Algorithm Design

High-performance processing of large scale graphs (i.e., sparse data) is crucial and pervasive. I worked on several graph mining problems.

- Proposing a novel, fast graph merging algorithm.
- Providing coarse-grained and medium-grained triangle counting formulations.
- Implementing architecture (resource)-aware parallelization techniques.

Scalable Triangle Counting on Distributed-Memory Systems (one of the Graph Challenge Innovation Award Winners) 2019
IEEE High Performance Extreme Computing Conference (HPEC)
S. Acer, **A. Yaşar**, S. Rajamanickam, M. M. Wolf and Ü. V. Çatalyürek

Fast Triangle Counting Using Cilk (one of the Graph Challenge Champions) 2018
IEEE High Performance Extreme Computing Conference (HPEC)
A. Yaşar, S. Rajamanickam, M. M. Wolf, J. W. Berry, Ü. V. Çatalyürek

An Iterative Global Structure-Assisted Network Aligner 2018
ACM International Conference on Knowledge Discovery & Data Mining (KDD)
A. Yaşar and Ü. V. Çatalyürek

SiNA: A Scalable Iterative Network Aligner 2018
IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)
A. Yaşar, B. Uçar and Ü. V. Çatalyürek

Performance Portability

Todays heterogeneous computing environments increased the importance of designing flexible algorithms that can run well on various platforms. I tried to address several arising issues.

- Porting graph merging algorithm to an emerging architecture (Emu Chick)
- Proposing a triangle counting formulation for heterogeneous systems

bbTC: A Block-Based Triangle Counting Algorithm on Heterogeneous Environments 2020
submitted to IEEE Transactions on Parallel and Distributed Systems (TPDS)
A. Yaşar, S. Rajamanickam, J. W. Berry and Ü. V. Çatalyürek

Linear Algebra-Based Triangle Counting via Fine-Grained Tasking on Heterogeneous Environments (one of the Graph Challenge Innovation Award Winners) 2019
IEEE High Performance Extreme Computing Conference (HPEC)
A. Yaşar, S. Rajamanickam, M. M. Wolf, J. W. Berry, J. S. Young and Ü. V. Çatalyürek

Programming strategies for irregular algorithms on the Emu Chick 2019
ACM Transactions on Parallel Computing (TOPC) - to appear
E. Hein, S. Eswar, **A. Yaşar**, B. Ucar, U. Catalyurek, T. Conte, J. Riedy, R. Vuduc, and J. S. Young

Patent

Distributing Data by Successive Spatial Partitioning 2017
Patent : US10430104B2
A. Gupta, S. Seshadri, **A. Yaşar**

Skills

- C++ (OpenMP, Cilk, TBB, Kokkos), C, Cuda, Python

Personal

- **Citizenship:** Turkey
- **Languages:** Turkish (native), English (professional proficiency), French (limited proficiency)