

## Ata TURK

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### CONTACT INFORMATION

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02215 Boston, MA, USA

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### RESEARCH INTERESTS

My research interests lie in the design/development of cloud-based bigdata platforms and improving the performance, security, or efficiency of cloud frameworks using machine learning and combinatorial mechanisms. I also have extensive expertise in designing algorithms for graph analytics. I proposed approximation algorithms for identifying graph features and developed partitioning, replication, scheduling tools for parallel computations on large scale graphs. My work has been published in prestigious journals and conferences such as TKDE, TPDS, JPDC, IPM, ACM SIGIR, ACM SoCC, IEEE BigData, IEEE IC2E and IEEE ICDM.

### EDUCATION

**Bilkent University**, Bilkent, Ankara TURKEY

Ph.D., Computer Engineering, 2004–2012

- Thesis Topic: *Utilizing Query Logs for Data Replication and Placement in Big Data Applications*
- Advisor: Professor Cevdet Aykanat
- Area of Study: Cloud Computing

M.S., Computer Engineering, September 2004

- Thesis Topic: *Design & Implementation of an Efficient Parallel Crawler*
- Advisor: Professor Cevdet Aykanat
- Area of Study: Parallel Computing

B.S., Computer Engineering, June 2002

- With Honors in Engineering

### PROFESSIONAL EXPERIENCE

**Massachusetts Open Cloud Initiative (MOC) and BU ECE Dept.**, Boston, MA

*Research Scientist*

**September 2016 -**

- Research scientist in BU ECE Dept. working on the Massachusetts Open Cloud (MOC) project, leading the bigdata and cloud healthcare solutions in MOC.

**Massachusetts Open Cloud Initiative (MOC) and BU ECE Dept.**, Boston, MA

*Postdoctoral Researcher*

**November 2014 - August 2016**

- Member of the Performance and Energy-Aware Computing Library (PeacLab), working on green cloud computing solutions
- Member of the Massachusetts Open Cloud Initiative (MOC), leading bigdata and cloud monitoring solutions
- Instructor to the Cloud Computing course jointly taught in Boston University and Northeastern University

**Yahoo! Research, Barcelona**, Catalonia, Spain

*Postdoctoral Researcher*

**June 2013 - November 2014**

- Member in Web Retrieval & Personalization Team, worked on
  - \* I designed the entity suggestion mechanisms for Yahoo! Search, that directed users to Yahoo verticals.

- \* I built user profiles for Yahoo News users to be used in news ordering.
- \* I designed a sentiment and impact analysis tool for commercial entities on Tumblr.
- \* I designed an improved Web frontier ranking system for crawling higher quality content.

**Bilkent University Comp. Eng. Dept.**, Turkey

*Postdoctoral Researcher*

**Sep 2012 - June 2013**

- Coordinator/researcher in EU-funded HPC projects

**Bor Software LLC**, Ankara, TURKEY

*Founder & managing partner of Bor Software LLC*

**June 2007 - Sep 2010**

- Mobile application development for iPhone, Blackberry and Java ME
- Developed and managed the Good Magazine website www.good.is
- Developed CMS for government organizations, video analytics solutions, Web-enabled and GIS solutions for electricity distribution networks
- Employed more than 10 workers, shares sold to Natek Bilisim LLC in 2011

CONFERENCE  
PUBLICATIONS

E. Ates, O. Tuncer, **A. Turk**, V. J. Leung, J. Brandt, M. Egele and A. K. Coskun, “Taxonomist: Application Detection through Rich Monitoring Data”, in EuroPar 2018.

A. Mohan, **A. Turk**, R. S. Gudimetla, S. Tikale, J. Hennessey, U. Kaynar, G. Cooperman, P. Desnoyers, and O. Krieger, “M2: Malleable Metal as a Service”, in *IEEE International Conference on Cloud Engineering (IC2E)*, 2018.

D. Turkoglu, **A. Turk**, “Edge-Based Wedge Sampling to Estimate Triangle Counts in Very Large Graphs”, in *IEEE International Conference on Data Mining (ICDM)*, 2017.

R. Pienaar, **A. Turk**, J. Bernal-Rusiel, N. Rannou, D. Haehn, P. E. Grant and . Krieger, “CHIPS: A Service for Collecting, Organizing, Processing, and Sharing Medical Image Data in the Cloud”, in *VLDB Workshop on Data Management and Analytics for Medicine and Healthcare (VLDB DMAH)*, 2017.

O. Tuncer, E. Ates, Y. Zhang, **A. Turk**, J. Brandt, V. J. Leung, M. Egele, and A. K. Coskun, “Diagnosing Performance Variations in HPC Applications Using Machine Learning”, in *International Supercomputing Conference (ISC HPC)*, 2017. (Gauss Award Winner)

**A. Turk**, H. Chen, A. Byrne, J. Knollmeyer, S. Duri, C. Isci, and A. K. Coskun “DeltaSherlock: Identifying Changes in the Cloud”, in *IEEE International Conference on BigData (IEEE BigData’16)*, pp. 763–772, 2016.

J. Hennessey, S. Tikale, **A. Turk**, E. Kaynar, C. Hill, P. Desnoyers, O. Krieger, “HIL: Designing an Exokernel for the Data Center”, in *ACM Symposium on Cloud Computing (SoCC’16)*, pp. 155–168, 2016.

**A. Turk**, R.S. Gudimetla, E. U. Kaynar, J. Hennessey, S. Tikale, P. Desnoyers, O. Krieger, “An experiment on Bare-Metal BigData Provisioning”, in *8th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud 16)*, 2016.

**A. Turk**, H. Chen, O. Tuncer, H. Li, Q. Li, O. Krieger, A. K. Coskun, “Seeing into a Public Cloud: Monitoring the Massachusetts Open Cloud”, in *USENIX Workshop on Cool Topics on Sustainable Data Centers (CoolDC 16)*, 2016.

M. Zapater, **A. Turk**, J. M. Moya, J. L. Ayala, A. K. Coskun, “Dynamic Workload and Cooling Management in High-Efficiency Data Centers”, in *International Green and Sustainable Computing Conf. (IGSC’15)*, pp 1–8, 2015.

G. B. Tran, **A. Turk**, B. B. Cambazoglu, “A Random Walk Model for Optimization of Search Impact in Web Frontier Ranking”, in *International ACM SIGIR Conference on Research and Development in Information Retrieval (ACM SIGIR’15)*, pp 153–162, 2015.

**A. Turk**, G. V. Demirci, C. Aykanat, S. v. Alfthan, I. Honkonen, “Investigation of Load Balancing Scalability in Space Plasma Simulations”, in *Applied Parallel and Scientific Computing (LNCS)*, vol. 7782, pp: 558–562, 2013.

**A. Turk**, B. B. Cambazoglu, C. Aykanat, “Hypergraph-Theoretic Partitioning Models for Parallel Web Crawling”, in *26th International Symposium on Computer and Information Sciences (ISCIS)*, 2011.

T. Kucukyilmaz, **A. Turk**, C. Aykanat, “Memory Resident Parallel Inverted Index Construction”, in *26th International Symposium on Computer and Information Sciences (ISCIS)*, 2011. (Appeared in *Computer and Information Sciences II*, pp: 19–25, 2011.)

O. K. Yasin, **A. Turk**, C. Aykanat, “Selective Replicated Declustering for Arbitrary Queries.”, in *15th International Euro-Par Conference on Parallel Computing (Euro-Par)*, 2009. (Appeared in *Lecture Notes in Computer Science*, vol: 5704, pp: 375–386, 2009.)

A. Cevahir, C. Aykanat, **A. Turk**, B. B. Cambazoglu, “A Web-Site-Based Partitioning Technique for Reducing Preprocessing Overhead of Parallel Pagerank Computation”, in *8th International Workshop on Applied Parallel Computing (PARA 2006)*, 2006. (Appeared in *Lecture Notes in Computer Science*, vol: 4699, pp: 908–918, 2007.)

B. B. Cambazoglu, **A. Turk**, C. Aykanat, “Data-parallel web crawling models”, *19th International Symposium on Computer and Information Sciences (ISCIS)*, 2004. (Appeared in *Lecture Notes in Computer Science*, vol: 3280, pp: 801–809, 2004.)

REFEREED  
JOURNAL  
PUBLICATIONS

O. Tuncer, E. Ates, Y. Zhang, **A. Turk**, J. Brandt, V. J. Leung, M. Egele, and A. K. Coskun, “*Online Diagnosis of Performance Variation in HPC Systems Using Machine Learning*”, *IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS)*, 2018.

H. Chen, **A. Turk**, S. S. Duri, C. Isci, A. K. Coskun “*Automated system change discovery and management in the cloud*”. *IBM Journal of Research and Development*. 60(2-3), pp. 2: 1-2: 10, 2016.

**A. Turk**, O. R. Selvitopi, C. Aykanat, H. Ferhatosmanoglu, “*Temporal Workload-Aware Replicated Partitioning for Social Networks*”. *IEEE Trans. Knowledge and Data Engineering (IEEE TKDE)*, 2014.

**A. Turk**, K. Y. Oktay, C. Aykanat, “*Query-Log Aware Replicated Declustering*”, *IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS)*. 24(5), pp. 987–995, 2012.

T. Kucukyilmaz, **A. Turk**, C. Aykanat, “*A Parallel Framework for In-Memory Construction of Term-Partitioned Inverted Indexes*”, *The Computer Journal*. 55(11), pp: 1317–1330, 2012.

O. R. Selvitopi, **A. Turk**, C. Aykanat, “*Replicated Partitioning for Undirected Hypergraphs*”, *Journal of Parallel and Distributed Computing (JPDC)*. 72(4), pp: 547–563, April 2012.

A. Cevahir, C. Aykanat, **A. Turk**, B. B. Cambazoglu, “*Site-Based Partitioning and Repartitioning Techniques for Parallel PageRank Computation*”, *IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS)*, 22(5), pp: 786–802, May 2011.

B. B. Cambazoglu, E. Karaca, T. Kucukyilmaz, **A. Turk**, C. Aykanat, “*Architecture of a Grid-Enabled Web Search Engine*”, *Information Processing & Management (IPM)* 43(3), pp: 609–623, May 2007.

SUBMISSIONS  
UNDER REVIEW  
AND IN  
PREPERATION

U. Kaynar, M. Abdi, M. H. Hajkazemi, **A. Turk**, R. Sambasivan, P.Desnoyers, O. Krieger, “*D3N: A Datacenter-scale Data Delivery Network*”. Submitted to *Usenix FAST*.

**A. Turk**, D. Turkoglu, “*Revisiting Wedge Sampling for Triangle Counting*”. To be submitted to *VLDB*.

U. Kaynar, **A. Turk**, P.Desnoyers, O. Krieger, “*Caching for Erosure-Coded Object Stores*”. To be submitted to *Usenix ATC*.

A. Mohan, **A. Turk**, P.Desnoyers, O. Krieger, G. Cooperman, “*Marrying Bare-Metal Frameworks for Long-Term Happiness*”. To be submitted to *Usenix ATC*.

PROJECTS

EU FP6 and FP7 Projects,

- *LEADS: (Large-Scale Elastic Architecture for Data as a Service)* (2014 - 2015), Role: Researcher,
- *PRACE-3IP: PRACE (Partnership for Advanced Computing in Europe) Third Implementation Phase Project* (2012 - 2014), Role: Researcher,
- *PRACE-2IP: PRACE (Partnership for Advanced Computing in Europe) Second Implementation Phase Project* (2011 - 2013), Role: Task Co-Leader, EU-FP7, Grant Agreement No: RI-283493, Bilkent Budget: 175,000 Euro.
- *PRACE-1IP: PRACE (Partnership for Advanced Computing in Europe) First Implementation Phase Project* (2010 - 2012), Role: Subtask Co-Leader, EU-FP7, Grant Agreement No: RI-261557, Bilkent Budget: 205,000 Euro.
- *SEE-GRID: South Eastern European GRid Enabled eInfrastructure Development*, Role: Researcher, EU-FP6, Specific Support Action, Contract No: 002356, Bilkent Budget: 76,000 Euro.

TUBITAK EEEAG Projects

- TUBITAK EEEAG Project No: 112E120, *Partitioning, Replication and Query Processing in Social Networks* (2012 - ), Role: Postdoc, Budget: 80,000 Euro.
- TUBITAK EEEAG Project No: 109E019, Cost Action IC0805 Open European Network for High Performance Computing, *Efficient Parallel Text Retrieval and Query Processing Under Replication Constraints* (2009 - 2011), Role: Researcher, Budget: 80,000 Euro.
- TUBITAK EEEAG Project No: 106E069, *Efficient Parallel Text Retrieval and Query Processing* (2006 - 2008), Role: Researcher, Budget: 90,000 USD.
- TUBITAK EEEAG Project No: 103E013, *Efficient Parallel Crawling* (2004 - 2006), Role: Researcher, Budget: 50,000 USD.

CONSULTING  
SERVICES

- TURKSAT, Consulting on Cloud Computing Investment Opportunities in Turkey, Jan 2011

- T2 Software LLC, Analyzing Social Media for Turkish Government and Private Sector: Listening, Measurement, and Engagement, Dec 2012 - Aug 2013.

- JOURNAL REFERENCE SERVICE
- *IEEE Transactions on Parallel and Distributed Systems*
  - *IEEE Transactions on Knowledge and Data Engineering*
  - *Journal on Parallel and Distributed Computing*
  - *The Supercomputing Journal*

- CONFERENCE SERVICE
- PC Member: IEEE Int. Conf. on High Perf. Comp. & Comm. (HPCC) 2014
  - PC Member: European Conference on Information Retrieval (ECIR) 2013, 2015
  - PC Member: High Performance Computing for Big Data (HPC4BD) 2015, 2016
  - PC Member: Conference on Information and Knowledge Management (CIKM) 2016
  - Chair: IEEE workshop on Big Data for Cloud Operations Management (BDCOM) 2016

TEACHING EXPERIENCE **Boston University Electrical and Computer Engineering Dept.**, Boston, MA, USA

*Instructor* **September 2015 - 2017**

- Instructor for BU EC528, CS528, NU 7680 Cloud Computing Course
  - Spring 2015 & Spring 2016 & Spring 2017
  - Designed and instructed a course that combines reading and discussion of influential publications in cloud computing and a large project, where projects are done by teams of 5 students working with a mentor from the industry. The course is currently being offered both in BU and Northeastern Universities.

**Bilkent University Computer Engineering Dept.**, Bilkent, Ankara TURKEY

*Teaching Assistant* **September 2002 to September 2012**

- TA and Grader for CS 473 Algorithms I
  - Fall 2004 to Fall 2011
  - Responsible for supervision of 2 hour laboratory where senior undergraduate students are tested for algorithmic skills.
- TA for CS 201: Fundamental Structures of Computer Science I
  - Autumn 2011
  - Responsible for 1 hour recitation and supervision of 1 hour laboratory where sophomore undergraduate students are tested for programming skills.
  - Developed supplementary course material for recitations.
- TA for CS 202: Fundamental Structures of Computer Science II
- TA for CS 342: Operating Systems
- TA for CS 352: Database Management Systems
- Lab Instructor for CS 101: Algorithms and Programming I Laboratory
- Lab Instructor for CS 102: Algorithms and Programming II Laboratory

SOFTWARE SKILLS Computer Programming and Platforms:

- Apache PIG, MapReduce (Hadoop), Cassandra, OpenStack, Vowpal Wabbit, Weka, Python, IPython, Jupyter, sklearn, UNIX shell scripting, awk, R, NoSQL, Java, C, PHP, MySQL, Postgres, Ruby on Rails, HIVE, C++, JavaScript, SQL, and others
- Version Control and Software Configuration Management:

- VCS (git, SVN), and others

Information/Internet Technology:

- Networking (UDP, TCP, DNS), Services (SQL, SMTP)

REFERENCES  
AVAILABLE TO  
CONTACT

**Dr. Cevdet Aykanat** (e-mail: [aykanat@cs.bilkent.edu.tr](mailto:aykanat@cs.bilkent.edu.tr); phone: +90-312-290-1625)

- Professor, Computer Engineering Department, Bilkent University
- ◇ Bilkent University, Department of Computer Engineering, Bilkent 06800 Ankara, TURKEY
- ★ *Dr. Aykanat was my MSc and PhD advisor.*

**Dr. Berkant Barla Cambazoglu**

- Senior Researcher, Yahoo! Research, Barcelona
- ◇ Avinguda Diagonal 177, 8th Floor, 08018, Barcelona, Catalunya (Spain)
- ★ *Dr. Cambazoglu was my manager in Yahoo! Research, Barcelona*

**Prof. Ayse K. Coskun**

- Assoc. Professor (BU ECE), BU Electrical and Computer Engineering,
- ◇ PHO 338, 8 St. Mary's Street, 02215, Boston, MA, USA
- ★ *Prof. Coskun was one of my advisors in Boston University*

**Prof. Orran Krieger**

- Professor of the Practice (BU ECE & CS), BU Electrical and Computer Engineering, Computer Science, and BU Cloud Computing Initiative (CCI)
- ◇ Room 587, 3 Cummington Mall, Boston University, MA, USA.
- ★ *Prof. Krieger was one of my advisors in Boston University and is one of the PIs at the Mass. Open Cloud Project.*