

ADNAN OZSOY

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EDUCATION

Ph.D. Computer Science May 2014

Indiana University Bloomington Bloomington, INDIANA

Thesis Title: Bit-vector Strategies for String Matching Algorithms on GPGPUs

Advisors: Dr. Martin Swamy & Dr. Arun Chauhan

M.Sc. Computer Science May 2007

The University of Texas at Austin Austin, TEXAS

B.Sc. Computer Science May 2005

Virginia Polytechnic Institute and State University Blacksburg, VIRGINIA

❖ Cum Laude, Minor in Mathematics

RESEARCH EXPERIENCE

Funded Projects: **Fall 2015 – Current**

- **Title:** “Effective and efficient parallelization of string matching algorithms using GPGPU accelerators, machine learning, and big data frameworks”, Funded by TUBITAK, 117E142, Duration: 30 months, 09.2017-06.2020
- **Title:** “Lattice-Based Cryptographic Protocol Design and Efficient Implementations”, Funded by TUBITAK, 117E636, Duration: 24 months, 2017-2019
- **Title:** " Design and Analysis of NTRU-based Cryptosystems Using Formal Methods", 2555 – TUBITAK – Shota Rustavelli Georgian National Science Foundation (SRGNSF) Joint Research Program, 118E312, Duration: 24 months, 2019-2021

Current Research Areas:

Main areas: Blockchain and Cryptocurrencies, Distributed Systems, Parallel Computing, HPC, GPGPU, Big Data Problems

- Blockchain Applications in Health, Land Registry, GDPR, Digital ID,
- Consensus Algorithms on Distributed networks
- Scalable Web – Microservices and Containerization
- Mobile embedded GPGPU Parallel Processing Systems
- High rate message handling in Distributed and Big Data frameworks
- Evaluating the Effects of Voltage Scaling on GPGPUs
- Line Rate Data Compression
- GPU Accelerated Real-Time Spectrogram and Signal Detection Processes in SDR
- Longest Common Subsequence (LCS) and Sequence Alignment

Past Projects: DAMSL, Indiana University Bloomington **Spring 2009-May 2014**

- Investigated regularity in irregular problems on GPGPUs
- Exploring string matching computational problems to port to the GPU architecture
- Designed and implemented lossless data compression, longest prefix match, longest common subsequence matching, and exact matching algorithms for GPGPUs
- Exploring scheduling and overlapping paradigms between GPU and CPU
- Implemented software on distributed and shared memory parallel systems using MPI, Pthreads, and CUDA

Past Projects: DALPS, GCLab, University of Delaware **Fall 2008**

- Molecular Dynamics simulations on general purpose GPUs.
- Performance testing for different types of GPUs and levels of precision in CUDA.

PROFESSIONAL EXPERIENCE

Hacettepe University, Turkey

Fall 2015 - Current

Assistant Professor

- Tenure Track position with teaching and research responsibilities

NETGSM, Turkey

2017-Current

Consultant

- Tackling technical problems in R&D projects including Big Data design problems, Data processing, Cloud solutions, Virtualization through Container technology, Microservice Architecture, Scalability Issues
- Improve academic outputs from projects such as publications, reports, patents, etc.
- Help with technical documentation

Projects:

1- Project: End-to-End Scalable Active Call Management and Pricing Model in Telecommunication Systems

Project Code: 7180242

Program Name: 1507 - SME R&D Startup Support Program Application

Project Start / End Date: 01.03.2018-01.06.2019 / 15 months

2- Project Name: Netsantral: High Scale Cloud based IP telephone exchange

Project Code: 7180609

Program Name: 1507 - SME R&D Startup Support Program Application

Project Start / End Date: 01.07.2018-31.12.2019 / 18 months

3- Project Name: Netsipp: Desktop Softphone Application

Project Code: 3181289

Program Name: 1501 - Industry R&D Projects Support Program Application

Project Start / End Date: 01.11.2018-31.12.2019 / 14 months

4- Project Name: Subscription System with Increased Reliability with Digital Contract Support and Different Verification Steps

Project Code: 3200070

Program Name: Called 1501 - Industry R&D Projects Support Program Application

Project Start / End Date: 01.02.2020-01.08.2021 / 18 months

STM, Turkey

Spring 2020-Current

Consultant

- Tackling technical problems in R&D projects including Blockchain in Digital Identity
- Advice and guide for implementation of the blockchain based digital identity using smart contracts under a permissioned network (Hyperledger Indy & Aries)

Havelsan, Turkey

Fall 2019

Consultant

- Tackling technical problems in R&D projects including Blockchain in Land Registry
- Advice and guide for implementation of the blockchain based land registry using smart contracts under a permissioned network (Hyperledger)

NVIDIA CUDA Teaching Center, Hacettepe Univ.

Fall 2015 - Current

Principal Investigator (Co-PI)

- Center for training and researching on parallel computing especially with GPUs

Edmodo Inc., CA, USA – Advertisement Services **June-November 2015**

Remote Consultant

- Developing a web based advertisement portal using Apache Thrift service
- Service provides ads specific to interest groups and users
- Tracking the viewing information and display analysis for advertisers

Bilkent University & Hacettepe University, Turkey **Fall 2014**

Lecturer

- Teaching Parallel and Distributed Computing (undergraduate), Parallel and Distributed Simulation Systems(graduate), and Introduction to Programming(Java) courses

Indiana University Bloomington, IN, USA **2008-2014**

Research/Teaching Assistant

- During Ph.D. studies engaged in several projects
- Areas of interest include parallel programming, high performance computing with GPUs, string matching algorithms, big data problems, distributed systems and application parallelism problems programming

SuperComputing Conference (SC), LA, USA **November 2010**

Student Volunteer - International Conf. for High Performance Computing and Comm.

- Involved in Education and Broader Engagement programs setup

Google Inc. & Freifunk (Google Summer of Code 2009), CA, USA **Summer 2009**

Student Developer

- Designed and developed SNMP interface to Freimap which lets monitor virtually any system data source value of a node in near real-time and react accordingly.
- This project is sponsored by Google and administrated by Freifunk

Dell Inc., TX, USA – Global Financial Services - IT **June 2007-June 2008**

Software Developer III

- Architected and developed global financial application components
- Provided level 3 support for key business applications
- Worked on enterprise application integration with web front end
- Proficient in .NET programming using C#, Visual Basic, ASP.NET; created relational table structures and stored procedures on both Oracle 10g and SQL Server 2005
- Attended Oracle PL/SQL training

Office of Survey Research (OSR), TX, USA **Fall 2006
& Spring 2007**

Programmer / Graduate Research Assistant

- Web Programming with ColdFusion, Perl and CASES/CATI
- Database administration: Managing relations and creating table structures for surveys
- System administration: Unix system administration

Cypress Industries, TX USA **Summer 2006**

Software Developer Intern

- Designed and developed both windows and web based reporting tools for sales department with .NET technologies, SQL Server on the backend

ADVISED THESIS

Ph.D.

- Ahmet Buğday (Graduated June 2020): Scaling Blockchain Using Adaptive Learning Based Reputation
- Alparslan Fişne: Efficient Parallel Programming For Nonlinear Signal Processing On Embedded Mobile Platforms
- Ateş Ateş: Blockchain Based Lateral Transshipment Model
- Ömer Faruk Çangır: Applying Deduplication On Blockchain Based Distributed Storage Technologies

M.S.:

- Aleaddin Özer : Lattice-Based Secure Cryptographic Protocol Design And Efficient Applications
- Sanberk Daver: Next Generation Acas X Simulation
- Yusuf Aksoy: Voltage Scaling On Graphics Processing Units And Applications On Blockchain Mining
- Merve Nur Tiftik (Co-Advisor): Improvement Of Process Discovery By Using Process Mining Algorithms Of Different Perspectives
- Musa Erhan (Co-Advisor – Graduated January 2020): Blockzincir Based Software Project Information Sharing And Estimation System
- Mengü Nazlı (Graduated June 2020): Effective And Efficient Parallelization Of String Matching Algorithms Using GPGPU Accelerators
- Emircan Koç (Graduated January 2020): Example Based Soft-Body Physics Simulation On Graphical Processing Units
- Uğur Taygan (Graduated June 2020): Parallelization Analysis Of Eco Tracking Algorithm On GPUs”

REFEREED PUBLICATIONS

Journals

- J4.** Ahmet BUGDAY, Adnan OZSOY, Serdar Murat OZTANER, Hayri SEVER: "Creating Consensus Group Using Online Learning Based Reputation in Blockchain Networks", Journal of Pervasive and Mobile Computing, (SCI-Expanded) 2019
- J3.** Alparslan Fişne, Adnan Ozsoy, "Design and implementation of real-time wideband software-defined radio applications with GPGPUs", Concurrency and Computation: Practice and Experience 30 (21), e4791, (SCI-Expanded) 2018.
- J2.** Adnan Ozsoy: "An Efficient Parallelization of Longest Prefix Match and Application on Data Compression", Journal of International Journal of High Performance Computing Applications (IJHPCA) (SCI-Expanded) 2015.
- J1.** Adnan Ozsoy, Martin Swany, Arun Chauhan: "Optimizing LZSS Compression on GPGPUs". Future Generation Computing Systems, The International Journal of Grid Computing and E-Science (SCI-Expanded). 2013.

Conferences

- C19.** Ozan Zorlu, Adnan Ozsoy, "Immutable, Secure and Trustless Access Control Framework on Ethereum", 2. Ulusal Blokzincir Çalıştayı, 2019.
- C18.** Aleaddin Özer, Adnan Ozsoy, Oğuz Yayla, "Kafes Tabanlı Kuantum Sonrası Algoritmaların Profil Analizi ve GPU Uygulamaları", 12. Uluslararası Bilgi Güvenliği ve Kriptoloji Konferansı, 2019.

- C17. Musa Erhan, Ayca Tarhan, **Adnan Ozsoy**, "A Conceptual Model for Blockchain-Based Software Project Information Sharing", International Workshop on Software Measurement and the International Conference on Software Process and Product Measurement, 2019.
- C16. Burakcan Ekici, Ayca Tarhan, **Adnan Ozsoy**, "Data Cleaning for Process Mining with Smart Contract", 4th International Conference on Computer Science and Engineering (UBMK), 2019.
- C15. Emican Koç, **Adnan Ozsoy**, "Approximate Data Driven Parallel Shape Matching for Soft Body Physics Simulations", International Conference on Artificial Intelligence and Data Processing, 2019.
- C14. Seval Capraz, Halil Azyikmis, **Adnan Ozsoy**, "GPU-Accelerated Route Planning of Multi-UAV Systems Using Simulated Annealing (SA) Algorithm", International Conference on Computer and Technology Applications, 2019.
- C13. Muhammed Ali Asan, **Adnan Ozsoy**, "Parallel Computation of Integral Images using CUDA", International Conference on Natural and Engineering Sciences 2019.
- C12. Mengü Nazlı , Onur Cankur, **Adnan Ozsoy**, "A Parallel Comparison of Several String Matching Algorithms Employing Different Strategies", International Conference on Data Science, Machine Learning and Statistics 2019 (DMS-2019)
- C11. Ahmet BUGDAY, **Adnan OZSOY**, Hayri SEVER: "Securing Blockchain Shards By Using Learning Based Reputation and Verifiable Random Functions", International Symposium on Networks, Computers and Communications (ISNCC'19) 2019
- C10. Önder Ayçiçek, **Adnan Ozsoy**, Murat Berk: " A Hybrid Model for Multiple Uses of Prepaid Telecommunication Common Assets", 2018 International Conference on Artificial Intelligence and Data Processing (IDAP), 1-9, 2018
- C9. Ozan Zorlu, Selma Dilek, **Adnan Ozsoy**, " GPU-Based Parallel Genetic Algorithm for Increasing the Coverage of WSNs", Parallel and Distributed Systems (ICPADS), 2017 IEEE 23rd International Conference on, 640-647, November 2017
- C8. Alparslan Fisne, **Adnan Ozsoy**: "Real-time Wide Band Digital Down Converter using GPGPU", BAŞARIM 2017, Istanbul, Turkey, 14-15 September 2017, [Paper invited for submission as a journal article](#)
- C7. Alparslan Fisne, **Adnan Ozsoy**: "Grafik processor accelerated real time software defined radio applications" 2017 25th Signal Processing and Communications Applications Conference (SIU), Antalya, 2017.
- C6. **Adnan Ozsoy**: " CULZSS-Bit: A Bit-Vector Algorithm for Lossless Data Compression on GPGPUs". International Workshop on Data Intensive Scalable Computing Systems (DISCS'14), International Conference for High Performance Computing, Networking, Storage and Analysis (SC14) 2014. [Paper invited for submission as a journal article](#)
- C5. **Adnan Ozsoy**, Arun Chauhan, Martin Swany:"Fast Parallel Longest Common Subsequence with General Integer Scoring Support". The International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM'14) 2014. [Paper invited for submission as a journal article](#)
- C4. **Adnan Ozsoy**, Arun Chauhan, Martin Swany: "Achieving TeraCUPS on Longest Common Subsequence Problem using GPGPUs". The 19th IEEE International Conference on Parallel and Distributed Systems (ICPADS'13), 2013.
- C3. **Adnan Ozsoy**, Martin Swany, Arun Chauhan: "Pipelined Parallel LZSS for Streaming Data Compression on GPGPUs". The 18th IEEE International Conference on Parallel and Distributed Systems (ICPADS'12), 2012. [Paper invited for submission as a journal article](#)
- C2. **Adnan Ozsoy**, Martin Swany: "CULZSS: LZSS Lossless Data Compression on CUDA", Proceedings of the IEEE International Conference on Cluster Computing(Cluster'11), Workshop on Parallel Programming on Accelerator Clusters (PPAC'11),pp.403-411, September, 2011.
- C1. J.E. Davis, **A. Ozsoy**, S. Patel, and M. Taufer: "Towards Large-Scale Molecular Dynamics Simulations on Graphics Processors". In Proceedings of the International Conference on Bioinformatics and Computational Biology (BICoB), New Orleans, Louisiana, USA, April 2009.

Referred Posters

P2. Furkan Kucukdemir, Ali Burak Ozakinci, **Adnan Ozsoy**: " **Benchmark Testing of Embedded GPGPU Parallel Processing Systems** ". BAŞARIM 2017, Istanbul, Turkey, 2017.

P1. **Adnan Ozsoy**, Arun Chauhan, Martin Swany: "**Towards Tera-scale Performance for Longest Common Subsequence using Graphics Processors**". International Conference for High Performance Computing, Networking, Storage and Analysis (SC13),2013.

HONORS and AWARDS

- **NVIDIA GPU Grant Program Award**, Hacettepe University, 2017
- **NVIDIA CUDA Teaching Center Award**, Hacettepe University, 2015
- Travel grant of \$400 by TCPP and NSF for the use of ICPADS'13, 2013
- Travel grant of \$1000 by TCPP and NSF for the use of ICPADS'12, 2012
- **NVIDIA University sponsorship** with a hardware donation worth of \$1200, 2012
- Supercomputing Student Volunteer program. (SC)'2010
- 2nd place winner at IEEE/ACM Supercomputer Conference (SC'09) High performance computing contest, November 2009.
- Google Summer of Code Program Completion, August 2009.
- Dean's List in all terms of undergraduate education, 2001-2005
- Awarded by Turkish Government (all tuitions, fees, and a stipend) a total of \$192,792 for undergraduate and masters' studies in the USA, 2001-2007
- Ranked 47th in nationwide (among 1.5 million) University Entrance Exam of Turkey, 2000

INVITED SEMINARS AND TRAINING

INVITED SEMINARS

- Speaker, Blockchain Seminars, at Havelsan, KVKK, Tapu Kadastro, Blockchain Summit, 2018-2019
- Speaker, "High Performance Computing with GPGPUs and Case Studies on GPGPU Adaptation", at Aselsan A.S., 12.2016
- Speaker, "High Performance Computing with GPGPUs and Recent Trends", at Havelsan A.S., 01.2017

TRAINING

- Lecturer, 3 days long "**NVIDIA CUDA Training**" to Aselsan A.S. engineers, Hacettepe University, 2017

TEACHING EXPERIENCE

Assistant Professor

Hacettepe University, Turkey

2014-Current

▪ Undergraduate

- **BBM 201** - Data Structures
- **BBM 203** - Data Structures Lab
- **BBM 202** - Algorithms
- **BBM 202** - Algorithms Lab
- **BBM 427** - Technology Seminars I
- **BBM 428** - Technology Seminars II
- **BBM 442** - Parallel Programming
- **BBM 443** – Found. of Blockchain

▪ Graduate

- **BBS 516**-Data Struc. and Algorithms
- **BIL 674** -Parallel Programming with GPUs
- **BIL 710** -Parallel and Distributed Simulation Systems
- **CMP 619** – Blockchain and Cryptocurrencies

Visiting Lecturer

Bilkent University & Hacettepe University, Turkey

Fall 2014

- **BBM 442** – Parallel and Distributed Computing (Undergrad)
- **BIL 710** – Parallel and Distributed Simulation Systems (Graduate)
- **CS 114** – Introduction to Programming for Engineers(Undergrad)

Teaching Assistant

Spring 2009-2014

- Operating Systems (Undergrad / Graduate), Parallel Programming, System Security, Data Structures, Intro. Comp. Science, Matlab for Engineers, Comp. Inf. Systems

REFERENCES - Available upon request.