

# AmirHossein Sojoodi

## Curriculum Vitae (Extended)

(Last Updated: June-2024)

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### PERSONAL INFORMATION

Languages Persian (maternal),  
English (fluent)  
French (basic)

### RESEARCH INTERESTS

High Performance Computing, Multicore and Parallel Processing, Distributed Computing, GPU Processing

### EDUCATION

- 2020-Present **Ph.D. In Electrical and Computer Engineering, Queen's University, Kingston, Canada**  
Research topic: High-performance GPU-aware Communications in Hybrid Clusters;  
**GPA: 4.0/4.0**
- 2012-2015 **M. Sc. In Software Engineering, Shiraz University, Shiraz, Iran**  
**Ranked 3<sup>rd</sup>** among students with GPA **17.66/20.00**  
**Thesis:** Design & Evaluation of a Large-Scale Data Processing Framework for Modern GPUs. (Enabling Apache Tez to use GPU) *supervised by Dr. F. Khunjush*
- 2007-2012 **B. Sc. In Software Engineering, Shiraz University, Shiraz, Iran**  
**Final Project:** Intelligent controller of Miss PacMan agent; *supervised by Dr. Zohreh Azimifar*
- 2003-2007 **High School, Imam Musa Sadr High school, Tehran, Iran, Major:** Mathematics & Physics

### COMPUTER SKILLS

- Programming Languages **Advanced:** C/C++, Java, Assembly  
**Intermediate:** Python, JS, TXL, Matlab, and Shell Scripting
- Programming Models & Platforms CUDA, OpenMP, MPI, UCX, WebGPU, PyTorch, NumPy/CuPy, Apache Ignite, Apache Hadoop, Apache Tez, Apache Spark, Apache Maven, Pthreads, MapReduce, JCuda, Java FX, GTK+
- Misc. Tools Git, Perf, Valgrind, NVIDIA Nsight Tools, Arm DDT, Vim, Auto Tools, Cmake, Nexus, Latex Visual Paradigm, Redmine, XenCenter, Squid, Swagger, Tableau
- Operating Systems **Advanced:** Ubuntu and Windows **Basic:** CentOS, Debian, and MacOS
- Video Editing Camtasia, Corel Video Studio, Proshow Producer, Adobe AfterEffects

### PUBLICATIONS

- 2024 **A. Sojoodi**, Y. H. Temucin, and A. Afsahi, "Enhancing Intra-Node GPU-to-GPU Performance in MPI + UCX through Multi-Path Communication," in *Proceedings of the International Workshop on Extreme Heterogeneity Solutions (ExHET)*, 1–6, doi: [10.1145/3642961.3643800](https://doi.org/10.1145/3642961.3643800) (**Best Paper Award**)
- 2022 P. Alizadeh, **A. Sojoodi**, Y. Hassan Temucin, and A. Afsahi, "Efficient Process Arrival Pattern Aware Collective Communication for Deep Learning," in *Proceedings of the European MPI Users' Group Meeting (EuroMPI)*, 2022, pp. 68–78, doi: [10.1145/3555819.3555857](https://doi.org/10.1145/3555819.3555857).

- 2022 P. A. Witte, R. J. Hewett, K. Saurabh, **A. Sojoodi**, and R. Chandra, "SciAI4Industry -- Solving PDEs for industry-scale problems with deep learning," *arXiv*, pp. 1–11, 2022. doi: [10.48550/arXiv.2211.12709](https://doi.org/10.48550/arXiv.2211.12709)
- 2022 Y. H. Temucin, **A. Sojoodi**, P. Alizadeh, B. W. Kitor, and A. Afsahi, "Accelerating Deep Learning using Interconnect-Aware UCX Communication for MPI Collectives," *IEEE Micro*, pp. 1–9, 2021, doi: [10.1109/MM.2022.3148670](https://doi.org/10.1109/MM.2022.3148670).
- 2021 Y. H. Temucin, **A. Sojoodi**, P. Alizadeh, and A. Afsahi, "Efficient Multi-Path NVLink / PCIe-Aware UCX based Collective Communication for Deep Learning," in *Proceedings of the IEEE Symposium on High-Performance Interconnects (HOTI)*, 2021, pp. 1–10, doi: [10.1109/HOTI52880.2021.00018](https://doi.org/10.1109/HOTI52880.2021.00018).
- 2020 **A. Sojoodi**, M. Salimi Beni, and F. Khunjush, "Ignite-GPU: a GPU-enabled in-memory computing architecture on clusters," *J. Supercomput.*, pp. 1–28, 2020, doi: [10.1007/s11227-020-03390-z](https://doi.org/10.1007/s11227-020-03390-z).
- 2020 M. S. Beni, **A. Sojoodi**, and F. Khunjush, "A GPU-Enabled Extension for Apache Ignite to Facilitate Running Genetic Algorithms," *2020 20th International Symposium on Computer Architecture and Digital Systems (CADS)*, Rasht, Iran, 2020, pp. 1-8, doi: [10.1109/CADS50570.2020.9211857](https://doi.org/10.1109/CADS50570.2020.9211857).

## PROFESSIONAL EXPERIENCES

- 2022-09 - **GPU Software Engineer**  
Present  
Part-time; at *Distributive, Kingston, Ontario, Canada*.  
Challenges: Enabling WebGPU in the Distributive compute network  
Achievement: Improve LeGendre Pair (length 45) algorithm; +700x speedup on WebGPUs  
Design and Develop a WebGPU microbenchmark for Distributed Compute Protocol (DCP)
- 2023-10 - **CUDA Developer**  
2024-04  
Part-time; at *RE Grant Consulting Company, Kingston, Ontario, Canada*.  
Challenges: Design and development of a CUDA microbenchmark for Rockport Networks (CERIO) systems.
- 2022-06 - **Research Intern**  
2022-08  
Part-time; at *Microsoft Research (MSR), Seattle, Washington, United States (Remote)*  
Achievement: Enabling GPU in Distributed Deep Learning (DistDL) framework utilizing CuPy
- 2020-09 - **Course Design and Development Specialist**  
2022-04  
Part-time; at Engineering Teaching and Learning Team (ETLT), *Faculty of Engineering and Applied Science (FEAS), Queen's University*
- 2018-09 - **R&D, XenServer and Linux administrator**  
2019-11  
Part-time; at *HPC group, CSE Dept, Shiraz University; supervised by Dr. F. Khunjush*.  
Challenges: To setup and maintain Apache Hadoop, Spark, Tez and Ignite clusters.
- 2016-04 - **Servers administrator, Data Visualization and Java backend developer**  
2017-02  
Full-time; at *Aria Hamrah Samaneh, Shiraz Section, Software Group, Shiraz, Iran*.  
Challenges: Data warehouse research and develop, data visualization with Tableau
- 2015-10 - **R&D, Business Intelligence (BI) Developer**  
2016-04  
Full-time; at *ICTC (Information and Communication Technology Center), Shiraz University*
- 2013-10 - **R&D, XenServer and Linux administrator**  
2015-10  
Part-time; at *HPC group, CSE Dept, Shiraz University; supervised by Dr. F. Khunjush*.  
Challenges: User management, setup and maintain various services such as nexus repository manager, apt cacher, squid firewall, version control system, project manager, etc.
- 2011-2012 **Network Administration Specialist**  
Part-time; at *CSE Dept, Shiraz University*
- 2008-2010 **Part-time member of Programming Contests (ACM ICPC) group, CSE Dept, Shiraz University**

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## TEACHING EXPERIENCE – ACADEMIC YEAR

### Lecturer:

- 2016 Winter **Introduction to Object Oriented Programming** with Java, Shiraz University, ICTC
- 2013 Summer **Software Engineering Lab**, undergraduate, Shiraz University
- 2012 Winter **Software Engineering Lab**, undergraduate, Shiraz University
- 2012 Summer **Software Engineering Lab**, undergraduate, Shiraz University

### Assistant:

- 2024 Winter ELEC374 - **Digital Systems Engineering**, undergraduate, Queen's University, by Dr. Ahmad Afsahi
- 2023 Fall ELEC379 - **Introduction to Algorithms**, undergrad, Queen's University, by Dr. Naraig Manjikian
- 2023 Winter ELEC374 - **Digital Systems Engineering**, undergraduate, Queen's University, by Dr. Ahmad Afsahi
- 2022 Fall ELEC278 - **Fundamentals of Information Structure**, undergrad, Queen's University, by Dr. Jianbing Ni
- 2022 Winter ELEC374 - **Digital Systems Engineering**, undergraduate, Queen's University, by Dr. Ryan Grant
- 2021 Fall ELEC278 - **Fundamentals of Information Structure**, undergrad, Queen's University, by Dr. A. Elwakeel
- 2021 Winter ELEC374 - **Digital Systems Engineering**, undergraduate, Queen's University, by Dr. Sean Whitehall
- 2020 Fall ELEC278 - **Fundamentals of Information Structure**, undergrad, Queen's University, by Dr. D. Athersych
- 2020 Winter ELEC374 - **Digital Systems Engineering**, undergraduate, Queen's University, by Dr. Ahmad Afsahi
- 2018 Fall **GPU Programming**, undergraduate, Shiraz University, by Dr. Farshad Khunjush
- 2015 Fall **GPU Programming**, undergraduate, Shiraz University, by Dr. Farshad Khunjush
- 2014 Winter **Multicore Programming**, graduate, Shiraz University, by Dr. Farshad Khunjush
- 2013 Fall **GPU Programming**, undergraduate, Shiraz University, by Dr. Farshad Khunjush
- 2012 Fall **Operating Systems**, undergraduate, Shiraz University, by Dr. Mohammadreza Moosavi
- 2012 Fall **System Programming** (Assembly), undergrad Shiraz University, by Dr. Gholamhossein Dastghaibifard
- 2012 Winter **Microprocessors**, undergraduate, Shiraz University, by Dr. Farshad Tajeripour
- 2011 Winter **Operating Systems**, undergraduate, Shiraz University, by Dr. Sattar Hashemi
- 2010 Winter **Principles of Programming** (C), undergraduate, Shiraz University, by Dr. Ali Hamzeh
- 2010 Winter **System Programming** (Assembly), undergraduate, Shiraz University, by Dr. Sattar Hashemi
- 2010 Fall **Operating Systems**, undergraduate, Shiraz University, by Dr. Sattar Hashemi
- 2009 Fall **System Programming** (Assembly), undergraduate, Shiraz University, by Dr. Sattar Hashemi

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## AWARDS AND ACCOMPLISHMENTS

- 2020-09 **Parya Scholarship** by [Parya Trillium Foundation Scholarship](#) which provides financial support for Iranian students in Canadian post-secondary institutions.
- 2019-01 **Best T.A** at CSE, Shiraz University, Shiraz, Iran. According to the students' poll. GPU Programming course supervised by Dr. F. Khunjush.
- 2016-08 **9<sup>th</sup> Place** at National IoT Hackathon, Iran University of Science and Technology, Tehran, Iran. As Shiraz University 1<sup>st</sup> team "SU" Introducing "Intelligent Outlet".
- 2015-02 **Silver Medal** at 7<sup>th</sup> National JavaChallenge, Sharif University, Tehran, Iran. As Shiraz University 1<sup>st</sup> team "Tolu" (with B. Ahmadi & M.R. Katebzadeh)
- 2012-07 **Gold Medal** at Chess Games, in Team Section, South of Iran Universities, Shiraz, Iran. As Shiraz University team (Captain: R. Gharakhloo)
- 2010-07 **5<sup>th</sup> Place** at IEEE CIG 2010, Students Competition, Miss Pacman Intelligent Controller. As Shiraz University team (with M. Asadi)

- 2010-07 **5<sup>th</sup> Place** at Kashan University 2<sup>nd</sup> International Programming contest, Kashan, Iran.  
As Shiraz University 3<sup>rd</sup> team "*PosixThreads*" (with *S. Kazemi and M. Saeedi*)
- 2006 **Silver Medal** at Chess Games, in Individual Section, High School Students. Tehran #1, Iran
- 2004, 2005, 2006 **Gold Medal** at Chess Games, in Team Section, High School Students. Tehran zone #1, Iran

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## RELATED EDUCATION

- Winter 2023 (Audit) ELEC 878 – Extreme Scale Networking, by Dr. Ryan Grant, at Queen’s University
- 2023-03 GTC Conference, by NVIDIA
- 2022-08 NVIDIA Deep Learning Institute (DLI) Certificates:  
1. Fundamentals of Accelerated Computing with CUDA Python,  
2. Fundamentals of Deep Learning, and  
3. Accelerating CUDA C++ Applications with Concurrent Streams
- 2022-03 GTC Conference, by NVIDIA
- 2021-11 Supercomputing (SC21) Conference
- 2021-11 GTC Conference, by NVIDIA
- 2021-08 SCINET Summer Workshop: **Debugging and Performance Tuning**
- 2021-08 Hot Interconnect Conference
- 2021-07 PUMPS+AI Conference by Barcelona Supercomputing Center
- 2021-06 SHARCNET HPC Summer Workshop: **Modern C++ and Parallel Programming**
- 2021-04 GTC Conference, by NVIDIA
- 2014-11 NVIDIA & Udacity Course: Intro to Parallel Programming with GPUs
- Fall 2019 Udacity: **Software Testing**, by *John Regehr*  
Udacity: **Intro to DevOps**, by *Karl Krueger and Dwayne Lessner*  
Georgia Tech & Udacity: **Software Development Process**, by *Alex Orso*
- Summer 2019 Addison-Wesley, *LiveLessons: Design Patterns in Java*, by *Douglas C. Schmidt*
- Spring 2019 Udacity: **Writing READMEs**, by *Walter Latimer*  
Udacity: **Craft Your Cover Letter**, by *Trinh Nguyen*  
Udacity: **Refresh Your Resume**, by *Trinh Nguyen*  
Udacity: **Strengthen Your LinkedIn Network**, by *Trinh Nguyen and Chris Saden*
- Summer 2018 SoloLearn App online courses: **Java, Python, C, C++, HTML and SQL**  
Udacity: **Introduction to Hadoop and MapReduce**, by *Ian Wrigley and Sarah Sproehnle*  
Udacity: **Configure Linux Webservers**, by *Michael Wales*
- Summer 2015 Berkeley, edX: **Intro to Big Data with Apache Spark**, by *Anthony D. Joseph*
- Fall 2014 NVIDIA and Udacity: **Intro to Parallel Programming with GPUs**, David Luebke and John Owens

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## MY TALKS

- 2023-10-13 **A Workshop about Documentation**, Book Club Group, Kingston, Ontario
- 2023-08-16 **LeGendre Pairs Optimization – Part 2**, Book Club talks at Distributive, Kingston, Ontario
- 2022-11-09 **LeGendre Pairs Optimization – Part 1**, Book Club talks at Distributive, Kingston, Ontario
- 2022-10-05 **Introduction to GPUs – Part2**, Book Club talks at Distributive, Kingston, Ontario
- 2022-09-28 **Introduction to GPUs – Part1**, Book Club talks at Distributive, Kingston, Ontario
- Fall 2019 **Start a Good Career**, CSE Dept Students, at Shiraz University
- Summer 2018 **Illusion of Decision**, Break Time in University. For high school students, at Shiraz University

Spring 2016	<b>Working during college</b> , CSE Dept Students, at Shiraz University
Fall 2016	<b>What is Software Engineering?</b> CSE Dept Students, at Shiraz University
Summer 2014	<b>Time Management</b> (Keynote Speaker), 8 <sup>th</sup> <i>Break Time in University</i>
Spring 2014	<b>Future Education</b> (Keynote Speaker), 1 <sup>st</sup> <i>Entekhab-e-Bartar</i> Conference
Summer 2013	<b>Climate Crisis</b> (Keynote Speaker at Opening Ceremony), 7 <sup>th</sup> <i>Break Time in University</i>
Spring 2011	<b>Art of Googling</b> (with Saeed Kazemi), CSE Dept Students, at Shiraz University
Spring 2011	<b>Compilers vs. Interpreters</b> (with Saeed Kazemi), CSE Dept Students, at Shiraz University

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## OTHER COURSES AND WORKSHOPS

2021-09-13	<b>Reading in Grad studies</b> , by <a href="#">SASS</a> at Queen's University
2021-09-06	<b>Grad life</b> , by <a href="#">SASS</a> at Queen's University
2021-09	<b>Time &amp; Project Management workshop</b> , by <a href="#">Mitacs</a>
2021-08	<b>Academic Connections Certificate</b> , by <a href="#">SASS</a> at Queen's University
2020-03	<b>Inter-cultural Awareness</b> , by " <a href="#">QUIC</a> " workshops at Queen's University <ul style="list-style-type: none"> <li>➤ In this 4-session workshop we learned about cultures, their roles in society, their differences, and inter-cultural communication techniques. Also, we learned about Indigenous people, and their history in Canada.</li> </ul>
Winter 2020	<b>Write Nights</b> , by " <a href="#">SASS</a> " workshops at Queen's University <ul style="list-style-type: none"> <li>➤ In this 10-session workshop we worked on writing in academic context.</li> </ul>
2020-03-10	<b>Presenting with Confidence</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-03-05	<b>Leading with Emotional Intelligence</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-02-27	<b>LinkedIn Session</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-02-13	<b>Commercialization Opportunities</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-01-23	<b>Three Minute Thesis</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-01-20	<b>Procrastination and Mindfulness</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-01-16	<b>Effective Communication with Supervisor</b> , by " <a href="#">Expanding your Horizons</a> " series at Queen's University
2020-01-16	<b>Notetaking and Writing</b> , by " <a href="#">SASS</a> " workshops at Queen's University
2020-01-09	<b>Reading Faster, Reading Better</b> , by " <a href="#">SASS</a> " workshops at Queen's University
2020-01-07	<b>From B to A: How to be a good Student</b> , by " <a href="#">SASS</a> " workshops at Queen's University
Fall 2019	<b>Self Determination Theory</b> , by Arash Kamali at Arche Academy, Shiraz, Iran <ul style="list-style-type: none"> <li>➤ In this 10-session workshop, I learned about non-violent communication, growth mindset, motivation causality, and self-determination practices.</li> </ul>

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## EXTRA-CURRICULAR ACTIVITIES

2023-2024	<b>PhD Representative at Queen's University, Graduate ECE Student Council</b> <ul style="list-style-type: none"> <li>➤ Graduate Electrical and Computer Engineering (GECE) student council is the governing body representing the students of Electrical and Computer Engineering at Queen's University.</li> </ul>
2023-November	<b>Panelist at Queen's University, Global Education Conference</b> <ul style="list-style-type: none"> <li>➤ I was a panelist in a session titled: Invitation not assimilation: Inclusive listening to expand academic spaces and connect to global knowledge. The <a href="#">conference</a> was held by QUIC and SASS.</li> </ul>
2022-Summer	<b>Podcast Editor and Guest at <a href="#">IV@Q</a></b> <ul style="list-style-type: none"> <li>➤ International Voices at Queen's University is a supportive listening space for members of the Queen's University community, developed in partnership between <a href="#">SASS</a> and the <a href="#">QUIC</a>. Episodes include topics about culture shock, developing your authorial voice, and navigating housing in Canada.</li> </ul>
2021-Summer	<b>Podcast Host at <a href="#">IV@Q</a></b>

- International Voices at Queen's University is a supportive listening space for members of the Queen's University community, developed in partnership between [SASS](#) and the [QUIC](#). Episodes include topics about culture shock, developing your authorial voice, and navigating housing in Canada.
- 2020-2021 **Content Creator at Queen's University, Graduate ECE Student Council**
  - Graduate Electrical and Computer Engineering (GECE) student council is the governing body representing the students of Electrical and Computer Engineering at Queen's University.
- 2017-2018 **Compulsory Military Service**
- 2009-2019 **Executive Member at Break Time in University ([BTIU](#))**
  - BTIU is a conference/symposium that has been held annually since 2006 every summer for high school students who can participate in this program and enjoy various creative classes and workshops. The conference objectives are:
    - Introducing university to high school students.
    - Improving their creativeness and team work skills.
    - Improving their cultural and social parts of their thoughts.
    - Improve staff committee skills, communication, management, responsibility, etc
  - BTIU has almost 20 different Committees. What I have done in BTIU:
  - **2009:** Member of budget and sponsor committee; and Catering Committee chair.
  - **2010:** Budget and sponsor committee chairman; and Opening-Closing Ceremonies Committee chairman, and editor.
  - **2011:** Opening-Closing Ceremonies Committee member and consultant; Photographer, Cinematographer, and editor.
  - **2012:** Opening-Closing Ceremonies Committee member and consultant; Cinematographer, and editor
  - **2013:** Opening-Closing Ceremonies Committee member and consultant; Photographer, Cinematographer, and editor.
  - **2014:** Documentary Committee chairman; Member of film and clip Editing
  - **2015:** Member of Scientific Committee; Ceremonies Speaker
  - **2016:** Workshop Evaluator
  - **2017:** Workshop Evaluator
  - **2018:** Evaluator and Workshop Instructor (Subject: Illusion of Decision)
- 2012-2016 **Member of Tolu group**
  - Co-founder and member of Tolu group since spring 2012. It's a group with almost 15 members that have meeting every week. We have seminars and talks in different subjects, mostly psychology, psychoanalysis, philosophy, history and sociology.
- 2014 **Executive Member at Entekhab-e-Bartar**
  - Major member of the group since its creation and its conference chair. It's a group with almost 10 staff and 15 consultants that holds workshops and classes for high school students about college majors and fields. We try to help them to choose a better way in their future by informing them about what's going on in each fields. In order to help them to realize what they actually like, we have different tests, psychology tests, sociology tests, IQ tests and face to face talk for each student.
- 2011-2014 **Executive Member at Students' Scientific Group, CSE Dept, Shiraz University**
  - In this group we work on different Seminars and Work-shops for students. Also each semester, courses and their exams scheduling is done by this group. We have a board for our announcements and posters.
  - I was a member of the group in 2009, 2010, 2012 and 2014 and its head in 2011.



Spring 2012 **Staff at 16th CSI International Symposiums on [Computer Architecture & Digital Systems](#) and [Artificial Intelligence & Signal Processing](#)**, Shiraz University, Shiraz, Iran

- Opening-Closing Ceremonies Manager; film and clip editor, Cinematographer

Spring 2011 **Executive Member at [Harekat Fest](#)**, Shiraz University

- It's a festival for Students Scientific Groups of Shiraz University and their achievements in one year of efforts. I was the head of Opening-Closing Ceremonies Committee, film and clip editor.

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## OLD PROJECTS

Fall 2021 **Multi-GPU Vector Reduction**, *implemented in CUDA*

- This project is a part of the course *ELEC 873 – Cluster Computing* at Queen's University. In this project, I have designed, implemented, and evaluated 9 different intra-node *reduction* approaches on 4 data buffers each of which resides on a GPU of a single node. The algorithms are based on 2 common reduction algorithms: Ring and Binomial Tree; and for each of these algorithms, I implemented their pipelined and multi-channel version and compared them against one another. All the algorithms are designed to run in a **single process** environment where one process can efficiently manage and handle multiple GPU data movement, and the major goal was to improve link efficiency.

Winter 2020 **Multi-Process-Ensemble-Methods**, *implemented in Python*

- This project is a joint work with Yiltan Temucin as a part of the course *ELEC 872 - Artificial Intelligence and Human Interaction* at Queen's University.
- In this project we worked on AMIGOs data set, with the EEG, ECG and GSR signals, and applied filtering, feature extraction, and dimensionality reduction in a parallel manner. We classified the data based on the emotions: neutral, disgust, happiness, surprise, anger, fear, and sadness. We implemented and compared 4 different classifiers: Logistic Regression, SVM, KNN, and AdaBoost. Using this method we received a **3.6x** performance improvement in running our pre-processing stage. We also combined these 4 models and used a voting classifier which provided more reliable results. More information can be found at the following address. Link: <https://github.com/Yiltan/Multi-Process-Ensemble-Methods>

Winter 2020 **OpenMP-to-CUDA-Transformation**, *implemented in TXL*

- This project is a joint work with Nicholas Merz as a part of the course *ELEC 875 - Design Recovery and Automated Evolution* at Queen's University.
- In this project we used TXL to transform simplified OpenMP C source codes to its equivalent CUDA version. The transformation takes multiple pre-assumptions into account to make the process easier, like availability of Unified Memory, and the source OpenMP code being race-free and valid. The project's complete documentation can be found at the following address. Link: <https://github.com/amirsojoodi/OpenMP-to-CUDA-Transformation-with-TXL>

2019 **Ignite-GPU**, *implemented in Java and CUDA*

- This project is a joint work with Majid Salimi, at Shiraz University HPC lab.
- Currently Apache Ignite does not support GPUs formally, therefore, we have designed, implemented, and evaluated a platform in which Apache Ignite integrates with the GPUs smoothly and provides the developers more computing power and performance. We have ported Genetic Algorithm, as a test case, to the Ignite-GPU and achieved around **200x speedup** compared to its Ignite-only version.

Summer 2015 **Simorgh – GPU-enabled Apache Tez**, *My M.Sc. thesis, implemented in Java and CUDA*

- Apache Tez provides a DAG execution programming model to users (Processing Vertices and Reader/Writer Edges). In this project, we have designed and developed a framework in which Apache Tez is integrated with Nvidia GPUs seamlessly. Our evaluations have shown that using GPUs for processing a Vertex gains **4 to 6x speedup**.

- Spring 2014    **DVONN Game**, *implemented in C and GTK+*
- This project is the design and implementation of DVONN Game. It can be checked at <http://en.wikipedia.org/wiki/DVONN>. The project is written with GTK+ in windows with Glade software to produce XML-like version of the graphic designs in Glade Interface Designer.
  - The project can be found here: <https://github.com/amirsojoodi/DVONN>
- Spring 2014    **Grid Information**, *implemented in Java*
- A joint work with Fatemeh Marzban.
  - The goal of this cross-platform (Windows and Linux) project is to monitor all the nodes in a local Grid and to get all of their resources information (including static and dynamic information of a resource). The libraries and technologies we used: Java RMI, SIGAR, ObjectDB, JPA, JGoodies, Swing, AWT and STAX.
  - More information: <https://github.com/amirsojoodi/GridInformationService>
- Spring 2014    **Grid Scheduler**, *implemented in Java*
- A joint work with Fatemeh Marzban.
  - This project gets computing nodes and jobs as input and draws a schedule to submit the jobs on more suitable stations. The used algorithms are MaxMin, MinMin, Suffrage and Genetic Algorithm. Its GUI is written with Swing and JGoodies.
- Fall 2013    **Prime Generator**, *implemented in C*
- This project is based on Atkin algorithm and Optimized as well as Parallelized using MPI, OpenMP, Pthreads, and CUDA. It can be run on both GPUs and CPUs of some computers.
- Fall 2013    **A Parallel Algorithms Library**, *Implemented in C and MPI*
- Including Matrix Multiplication, Bucket Sort, Bitonic Merge Sort, PI Computation (Monte Carlo, Integration and Summation Series method), Moor Shortest Path in Graph, Mandelbrot Series, Insertion Sort, Histogram, Factorial, Simulating Heat Transfer, and Prefix Sum.
- Spring 2013    **Particle Swarm Simulation**, *implemented in C*
- A joint work with Arash Pourhabibi Zarendi.
  - The project is based on Barnes-Hut algorithm and parallelized using Pthreads library and OpenMP directives.
- Fall 2012    **Linux Shell**, *implemented in C*
- A shell (remote and local) that has some of the *bash* features such as: basic execution, background jobs management, change working directory, arbitrary number of arguments processing, clear terminal and process management.
  - The project can be found here: [https://github.com/amirsojoodi/AHS\\_Bash](https://github.com/amirsojoodi/AHS_Bash)
- Spring 2012    **Constructing DFA from an Arbitrary Grammar**, *implemented in Java*
- This project is developed to construct a DFA from an input Grammar. First, the input grammar is converted to Regular Expression for each degree. Then, each RegEx is converted to NFA. In each step, the generated NFA is added to the current resulted DFA as far as generated till then. After that, the resulted NFA is converted to DFA. *GraphViz* and *Dot* are used to draw states of constructed DFA in each step and save them as PNG files.
- Spring 2012    **Online Hotel Reservation and Management**, *implemented in Java*
- A joint work with Pedram Veisi.
  - This project is a web-based software implementation using JEE framework and integrated with Glassfish and ObjectDB as *the application server* and *data persistency tool* (ORM method) respectively. We used Visual Paradigm software for



Class, ERD, Use Case and other diagrams and these technologies for development: JSF, JPA and Java Bean

Spring 2011 **Troyis Player**, *implemented in Java*

- A joint work with Amir Hossein Shahriari.
- This project captures computer screen and processes the image of the Troyis game board (Situation and state of the horse, empty and full spots) and after processing the board and extracting the required data, the decision-maker module decide which place is the best choice for the next move, using Bellman-ford algorithm. Then the decided option is passed to the mouse buffer. The game is available on [www.troyis.com](http://www.troyis.com).
- The project can be found here: <https://github.com/amirsojoodi/TroyisPlayer>

Fall 2011 **Front-End of a C Compiler**, *implemented in Flex Package (Lex and Yacc)*

- A joint work with Saeed Kazemi and Pedram Veisi.
- The goal of the project is to grab an input C file and generate a 3-address-code translation and pass to the back-end of the C compiler (Lexical analyzing of the code and generating its parse tree)

Fall 2010 **Http Server**, *implemented in Java*

- A simple Http Server with general error codes and availability to download and upload regular files.

Summer 2010 **Miss PacMan Player**, *implemented in Java*

- A joint work with Mahsa Asadi.
- This project captures computer screen and processes the image of the PacMan game board (Position and state of Miss PacMan, ghosts, walls, dots and fruits) using median filter; and after processing the board and extracting the objects out, the AI part decides which way is the best choice for the next move using A\* algorithm. Then, the decided option is passed to the keyboard buffer. As an extra feature, the project draws a simple board simulation next to the main board in order to show what is understood from the board in every cycle of processing. The game is available on [www.webpacman.com/mspacman.htm](http://www.webpacman.com/mspacman.htm).

Spring 2010 **Bank Account Management**, *implemented in C*

- A joint work with Saeed Kazemi.
- This project is written in two modes: Multiprocess and Multithread, which contains a server and multiple clients which operate over http protocol. The server would open and listen on an arbitrary port, and clients can establish a connection through this port in order to carry out various operations, such as creating a new account, deposit, transfer and withdrawal.

Fall 2009 **Course Scheduler**, *implemented in Java and C#*

- A joint work with Babak Ahmadi, Mohammad Moein, and Mehrdad Mehrjoo
- The goal of this project is to find a solution to the CSE department courses' schedule using Island Genetic Algorithm. It can save the output results in a beautiful format in Excel files, using JXL; and its GUI is implemented in C#.

Fall 2009 **Launch Format Operation on a Disk Partition**, *Implemented in Assembly*

- This project's mostly wanted feature was linking 16-bit and 32-bit object files that was done with 16-bit Tasm and 32-bit Nasm Assemblers. In this project I tried to invoke system processes to perform the *format* task.

Spring 2009 **Custom CPU Pipeline Data-Path with Simple Assembler**, *Implemented in Verilog and Java*

- A joint work with Parviz Nekooei.
- It has all stages of the pipeline of a RISC CPU with size of 16 bit for each instruction. It has these features: hazard detection, overflow detection, register forwarding,

pipeline stall, assembler for Input Instructions, and write out the register-file contents in each cycle.

Spring 2009 **Othello Game, Implemented in Java**

- It is a graphical implementation of the Othello game written in Java Swing which supports two playing modes (Human against computer and human against human). The computer-player module written using Min-Max algorithm.

Fall 2008 **File Transfer through Serial COM Ports, implemented in Assembly**

- This project was written to transfer a file through COM ports between two computers. Its idea was adapted from the book: *Art of Assembly*. The receiver part of the project has to run on the receiver computer first and wait for the sender. Then the sender computer can initiate the connection and perform a full handshake with the receiver and send any arbitrary file.

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## INTERESTS

Art Music, Movies, Poem, Writing, Playing Music Instruments, Singing, Photography, Film Editing  
Sports Soccer, Volleyball, Chess, Running, Biking, Mountain Climbing  
Misc. Coding, Teaching, Reading (about Philosophy, Sociology, Psychology, and Poetry), Meditating

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## REFERENCES

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