Bardia Ardakanian

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EDUCATION

Amirkabir University of Technology *(Tehran Polytechnic), Tehran, Iran*
B.Sc., Computer Engineering, Artificial Intelligence and Robotics
Sep 2019 - Sep 2024
GPA: **17.68** / 20 (**3.66**/4) - Last Two Year GPA: **18.47** / 20 (**3.84**/4)
Project: Unsupervised Camera Lidar Fusion for Fast Region Proposal
Supervisor: Mahdi Javanmardi, Jury: Mohammad Rahmati

Allameh Tabatabaee *High School, Tehran, Iran*
Diploma in Mathematics and Physics Sep 2015 - June 2019
GPA: High School **19.53** / 20 , Pre-University **18.96** / 20

RELATED COURSES

- Computational Intelligence
- Fundamentals of Artificial Intelligence
- Data Mining
- Applied Linear Algebra
- Discrete Mathematics
- Data Structure & Algorithms
- Design and Analysis of Algorithms
- Theory of Languages and Automata
- Linear Optimization
- Software Engineering I
- Software Engineering II
- Software Testing
- Compiler Design and Concepts
- Database Management Concepts and Systems
- Fundamentals of Cloud Computing
- Web Programming
- Computer Networks
- Operating Systems
- Embedded and Real-Time Systems
- Computer Architecture
- Microprocessor and Assembly Language

Proudly got A in all above

RESEARCH EXPERIENCE

Research Assistant*, Robotics Lab, Amirkabir Univ. of Tech. — Sep 2023 - now*

- **Unsupervised Camera Lidar Fusion for Fast Region Proposal** - B.Sc. Project
- **Abstract**: In recent years, the integration of multisensory data such as camera and LiDAR in object detection systems has garnered significant attention. This integration can help improve accuracy and efficiency in object recognition. However, the collection and manual labeling of data required to train object detection models is a time-consuming and costly process. In this research, we evaluate the performance of a proposed method for region proposal using unsupervised learning and the fusion of camera and LiDAR data. The main objective is to determine how this approach can be effective in the region proposal process and how it affects the accuracy and speed of object detection. To this end, two-dimensional camera images and three-dimensional LiDAR data are fused, and unsupervised clustering algorithms are employed to identify regions containing objects. The results indicate that this method can detect object-containing regions with acceptable accuracy without the need for labeled data, which can help reduce the costs and time required for developing object detection systems.

- Skills: Python, Pytorch, SciPy

***Research Assistant**, Hardware Lab, Amirkabir Univ. of Tech — June 2023 - now*

- Developed a reinforcement learning model to optimize third-layer cache performance, focusing on memory access pattern recognition to enhance computing efficiency.
- Skills: C/C++, Gem5

***Research Collaborator**, University of Toronto, Department of Electrical and Computer Engineering* — Sep 2022 - Sep 2023

- **Deep Active-Learning Object Detection**: Developed a model by training the SSD network with active learning techniques, utilizing Variational Autoencoders (VAEs) and Stable Diffusion to filter irrelevant images from the training dataset efficiently.
- **Super-Resolution Enhancement using XAI**: Assessed the integration of explainable AI (XAI) techniques to enhance the robustness of the SwinIR model on blurry and noisy images.
- **Deep Semi-Supervised Image Semantic Segmentation**: Assessed the use of CycleGAN and a novel loss function to generate varied training data, aiming to improve the accuracy of NVIDIA's SemanticGAN model.
- Skills: Python, Pytorch, TensorFlow, Numpy, OpenCV

PUBLICATIONS AND TECHNICAL REPORTS

- Adarsh Salagame, Harin Kumar Nallaguntla, **Bardia Ardakanian**, Eric Sihite, Gunar Schirner, Alireza Ramezani, "Reinforcement Learning-Based Model Matching to Reduce the Sim-Real Gap in COBRA," under review at *American Control Conference (ACC)*, 2025. Available at: Link
- **Bardia Ardakanian**, Mahdi Javanmardi, "Unsupervised Camera Lidar Fusion for Fast Region Proposal," (Written in Farsi).
- **Bardia Ardakanian**, "Development of Natural and Artificial Intelligence - Post-Selection Dialogue: Challenges to Post-Selection," *IEEE Cognitive Development Systems Newsletter*, vol. 18, no. 2, pp. 6-11, 2024. Available at: Link

TEACHING EXPERIENCE

- **Teaching Assistant, Database Management Concepts and System**
  Under the supervision of HamidReza Shahriari — Spring 2023 & Fall 2023
  Coordinating the team + Holding classes + Grading assignments + Holding midterm and final exams — (53, 25 students)
- **Teaching Assistant, Compiler Design**
  Under the supervision of Saeedeh Momtazi — Spring 2023 & Fall 2024
  Holding classes + Designing assignments + Grading assignments — (37, 33 students)
- **Teaching Assistant, Operating Systems**
  Under the supervision of Seyyed Ahmad Javadi — Spring 2023
  Holding classes + Grading assignments — (62 students)
- **Instructor, Fundamentals of Linux**
  Amirkabir LinuxFest — Fall 2022
  (200+ attendees)
- **Instructor, Linux Control Groups**
  Amirkabir LinuxFest — Fall 2022
  (200+ attendees)

- **Teaching Assistant, Computer Architecture**
  Under the supervision of Elham Cheshmikhani Fall 2022 & Spring 2023
  Coordinating the team + Holding classes + Grading assignments (41, 38 students)
- **Teaching Assistant, Computational Intelligence**
  Under the supervision of Mohammad Mehdi Ebadzadeh Spring 2023
  Holding classes + Grading assignments (79 students)
- **Teaching Assistant, Algorithm Design**
  Under the supervision of Hamid Haj Seyyed javadi Fall 2022
  Coordinating the team + Holding classes + Making assignments + Grading assignments (57 students)
- **Teaching Assistant, Algorithm Design**
  Under the supervision of Alireza Bagheri Fall 2022
  Holding classes + Grading assignments (75 students)
- **Teaching Assistant, Discrete Mathematics**
  Under the supervision of Mostafa Haghir Chehreghani Fall 2021 & Fall 2022
  Coordinating the team + Holding classes + Grading assignments (30, 33 students)
- **Teaching Assistant, Applied Linear Algebra**
  Under the supervision of Mostafa Haghir Chehreghani Spring 2022
  Coordinating the team + Holding classes + Grading assignments (65 students)
- **Teaching Assistant, Applied Linear Algebra**
  Under the supervision of Maryam Amirmazlaghani Spring 2022 Coordinating the team + Holding classes + Grading assignments (52 students)
- **Teaching Assistant, Computer Architecture**
  Under the supervision of Hamed Farbeh Spring 2022
  Holding classes + Grading exams (63 students)
- **Teaching Assistant, Data Structure & Algorithms**
  Under the supervision of Sajad Shirali-Shahreza Spring 2022
  Coordinating the team + Holding classes + Grading assignments (36 students)
- **Instructor, Data Structure & Algorithms**
  Under the supervision of Ehsan Nazerfard Fall 2021
  Coordinating the team + Holding classes + Grading assignments (45 students)
- **Teaching Assistant, Advanced Programming**
  Under the supervision of Hossein Zeinali Fall 2021 & Spring 2021
  Coordinating the team + Holding classes + Grading assignments (76, 41 students)
- **Teaching Assistant, Fundamentals of Programming**
  Under the supervision of Bahador Bakhshi Spring 2021 & Fall 2020
  Holding classes + Grading assignments (64, 22 students)

WORK EXPERIENCE

Machine Learning Engineer Sep 2022 - now
Sepid Daneh Zarvan Toos Co., Tehran/Mashhad, Iran

- Developed robot control systems for sorting and packaging robotic arms, reducing operational costs by 10%.
- Deployed business analysis and provided new business strategies, resulting in a 17% reduction in costs.
- Optimized delivery service routing and distribution, leading to a 28% reduction in operational costs.

- Assembled the packaging line, programming systems like conveyor belts, robotic arms, and sorting sections.
- Synchronized the operations of these systems for efficient performance.

Software Developer July 2022 - Sep 2022
System Group Co., Tehran, Iran

- Developed a new service compensation module for the Rahkaran ERP product, improving processing speed by 33% for over 39,000 facilities and industries in Iran.
- Redesigned the user interface using Angular, JavaScript, and HTML/CSS.
- Part of the debugging team, resolving zero-day bugs that affected core features.

Backend Developer July 2021 - July 2022
Fanap Soft Co., Tehran, Iran

- Led the transformation of the WePod infrastructure from a monolithic to a microservice architecture, increasing system speed by 240% and improving overall performance.
- Converted key money transfer services (Paya, Satna, and debit) into microservices, enhancing the scalability and reliability of financial transactions.
- Developed critical modules, including online card password changes and eligibility filters for money transfer requests.
- Served as Scrum Master, promoting Agile methodologies to enhance team collaboration and support iterative development.
- Developed a system recovery solution for server infrastructure, ensuring operational resilience.

IT Intern June 2017 - Sep 2017
Khoshgovar Tehran Co. (Coca Cola Iran), Tehran, Iran

TOP ACADEMIC PROJECTS

- **XTC Texture Classifier**
  Designed a classifier that detects similar sub-images in a given image, using the vgg16 model, a linear regression, and DIV2K dataset, with an accuracy of 95%
- **Reinforced Cache**
  Designed a replacement policy for the third layer cache using reinforcement learning
- **DL-NLP Code Repair**
  Trained the dear model with a custom dataset for internal code repair.
- **Computational Intelligence 1**
  Built a Neural Network from scratch using NumPy
- **Computational Intelligence 2**
  Developed a 2D Flappy Bird-like game using neural networks for agent decision-making and evolutionary algorithms for optimization
- **Information Retrieval**
  Designed a simple search engine that uses the inverted index to index content
- **Data Mining**
  Implementation of C4.5, Kmeans, DBSCAN, SpectralClustering, FB-tree algorithms
- **Signal and Systems**
  Implementation of all types of Fourier Transform (written in Python)

- **Microprocessor and Assembly Language**
  Simulation of an airplane emergency control system in Proteus with ATMega16
- **Principles of Compiler Design**
  Implementation of a front-end compiler for an imperative programming language using ANTLR (written in C)
- **Internet Engineering (Web Programming)**
  Implementation of the front-end and back-end of an online chatbox (written in Golang, Angular)
- **Fundamentals of Cloud Computing**
  Engineered an ad API monetization service (Written in Python + Django, and Docker)
- **Software Engineering 1**
  Implemented a botnet that scrapes sites such as Twitter, Reddit, and Telegram around buying and selling in the Iranian stock market, and with the help of text emotion detection techniques using NLP, creates buying and selling signals about shares
- **Software Engineering 2**
  Implementation of an automated testing software (written in Java, maven)
- **Software Testing**
  Implementation of an automated testing framework (written in Python)
- **Database Design**
  Implementation of a university portal with Test-driven development (TDD)
- **Computer Networks**
  Implementation of a simplified telnet protocol (written in Python)
- **Linear Optimization 1**
  Developed a Soft-Margin Support Vector Machine (SVM) using Pyomo and optimization techniques
- **Linear Optimization 2**
  Implemented a Support Vector Machine from the ground up using NumPy
- **Database Design and Systems Lab**
  Developed a URL shortener in Python and SQL
- **Operating Systems**
  Modified xv6 by adding system calls, and implementing new scheduling algorithms and ticket locks. Kernel-level threads are also added
- **Logic Circuit**
  A smart home environment using Verilog to understand logical circuits was simulated
- **Data Structures and Algorithms**
  Implementation of a GPS with various shortest-path algorithms
- **Advanced Programming**
  Developed a 2D Tank Trouble game (written in Java)
- **Fundamentals of Programming**
  Implementation of Paint, Snake, Tetris, scientific calculator and Lonely-cell game (written in C)
- **Computer Engineering Department Archive**
  Founded and managed the GitHub-based Computer Engineering Department Archive, housing 90+ course resources. Praised by faculty, it serves as a critical student study aid

HONORS AND AWARDS

- Ranked 20th out of 130 undergraduate students in Computer Engineering, Amirkabir Univ. of Tech. (Top 15%) 2024
- Among the top 3% in the National Entrance Exam for Graduate Studies in Computer Engineering 2024
- Elected as Head of Student Affairs on the Student Guild Council of the Department of Computer Engineering, Amirkabir University, 2020
- Elected as a Member of the General Student Guild Council, Amirkabir University 2020
- Lead Coordinator for Presenter Recruitment at annual department events, including ICPC, AAISS, LinuxFest, NoobChallenge, CTF, and GameCraft through the Student Scientific Chapter of the Department of Computer Engineering, Amirkabir University 2020
- Among the top 1% in the National Entrance Exam for Undergraduate Studies in Math & Physics 2019

TECHNICAL SKILLS

- **Programming Languages:** Python, C, C++, Java, C#, Go, R, MATLAB, Shell Scripting, SQL
- **Frameworks & Libraries:** TensorFlow, PyTorch, Keras, OpenCV, ROS, Scikit-learn, NumPy, SciPy, Pandas, Matplotlib, Django, Angular, Spring, Maven
- **Databases:** PostgreSQL, MySQL, Oracle DB, MS SQL Server, MongoDB, Redis, Elasticsearch
- **Tools & Technologies:** Git, Docker, Kubernetes, Jenkins, Ansible, LaTeX; **OS:** Linux (Ubuntu, Fedora, Kali), Windows

AUDITED AND ONLINE COURSES

- **Fundamentals of Robotics** fall 2024
  by Prof. Mahdi Javanmardi, Amirkabir University of Technology
- **Machine Learning Engineer Career Track** summer 2023
  by Datacamp
- **Machine Learning Specialization (3 courses)** summer 2022
  by Coursera
- **Deep Learning Specialization (5 courses)** summer 2022
  by Coursera

MEMBERSHIPS

- **Siliconsynapse Lab Meetings** – Dr. Alireza Ramezani, Northeastern University Mar 2024 - now
- **Member of the Student Guild Council** of the Department of Computer Engineering - Amirkabir University of Technology Sep 2020 - Sep 2023
- **Member of General Student Guild Council** of the Department of Computer Engineering - Amirkabir University of Technology Sep 2020 - Sep 2023
- **Member of Student Scientific Chapter** of the Department of Computer Engineering - Amirkabir University of Technology Sep 2020 - Sep 2022

LANGUAGES & TEST SCORES

Persian *(Farsi): Mother tongue (Native)*
English*: Professional working proficiency (TOEFL: 111 - R28 - L27 - S27 - W29)*

REFERENCES

- **Hamed Farbeh, Assistant Professor**
  Member of Hardware Group, CEIT, AUT
  Email: farbeh@aut.ac.ir
- **Alireza Bagheri, Associate Professor**
  Member of Software Group, CEIT, AUT
  Email: ar_bagheri@aut.ac.ir
- **Mostafa H. Chehreghani, Assistant Professor**
  Member of Artificial Intelligence Group, CEIT, AUT
  Email: mostafa.chehreghani@aut.ac.ir
- **Ehsan Nazerfard, Assistant Professor**
  Member of Artificial Intelligence Group, CEIT, AUT
  Email: nazerfard@aut.ac.ir
- **Hamidreza Shahriari, Assistant Professor**
  Member of Artificial Intelligence Group, CEIT, AUT
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- **Sajad Shirali-Shahreza, Assistant Professor**
  Member of Software Group, CEIT, AUT
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- **Mahdi Javanmardi, Assistant Professor**
  Member of Artificial Intelligence Group, CEIT, AUT
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- **Mohammad Mehdi Ebadzadeh, Professor**
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- **Seyyed Ahmad Javadi, Assistant Professor**
  Member of Computer Networks Group, CEIT, AUT
  Email: sajavadi@aut.ac.ir
- **Elham Cheshmikhani, Assistant Professor**
  Department of Computer Science and Engineering, Shahid Beheshti University
  Email: e_cheshmikhani@sbu.ac.ir
- **Hamid Haj Seyyed Javadi, Professor**
  Department of Computer Engineering, Shahed University
  Email: hamid.h.s.javadi@gmail.com