Ali Gholami

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EDUCATION

B.S. Computer Engineering @ Amirkabir University of Technology
[Global Rank of 165 in CS] GPA: 3.6/4
[National Center of Excellence in A.I.]

Mathematics & Physics Diploma @ Kamal Highschool GPA: 19/20

RESEARCH INTERESTS

- Visual Question Answering
- Image Segmentation
- Image Captioning
- Deep Learning

RELATED COURSES

Machine Learning @ Amirkabir University of Technology
Computer Vision @ Udacity
Deep Learning @ Udacity
cs231n @ Stanford University
OpenMP @ Intel

RESEARCH EXPERIENCE

CEIT @ Amirkabir University of Technology Dec 2017 – Present
Computer Vision — Pattern Recognition

- Implementation of *AlexNet CNN* architecture using *Tensorflow*. [code]
- Implementation of a *DCGAN* to draw *MNIST* using *Tensorflow*. [code]
- Implementation of a *Variational Autoencoder* using *Tensorflow*. [code]
- Implementation of various *Deep Learning* techniques using *Tensorflow*. [code]

TECHNICAL REPORTS

Statistical Pattern Recognition
Advisor: Prof. Mohammad Rahmati

- *Introduction to Linear Algebra – Statistics – Probabilities* [docs]
- *Bayesian Decision Boundaries – Bayes Error Bounds – Risk Minimization* [docs]
- *Maximum Likelihood & Bayesian Parameter Estimation* [docs]
- *Kernel Density Estimation – KNN Density Estimation* [docs]
- *PCA – FLDA – Feature Subset Selection* [docs]

Foundations of Data Mining
Advisor: Prof. Ehsan Nazerfard

- *Association Rule Mining – Feature Engineering* [docs]
- *Decision Tree Classifier – Data Cleaning* [docs]
- *Naive Bayes Classifier – Spam Filtering – Text Processing* [docs]

Design & Implementation of Programming Languages
Advisor: Prof. Mehran S. Fallah

- *Induction & Denotational Semantics – Lambda Calculus* [docs]
- *Lisp & Garbage Collection – Higher-order Functions* [docs]

- *Algol & Meta Language – ML Data Types & Patterns* [docs]
- *Type Safety & Type Inference – Polymorphism* [docs]

Computer Networks
Advisor: Prof. Siavash Khorsandi
- *Introduction to Computer Networks* [docs]
- *Packet Transmission Approaches – Congestion Control* [docs]
- *Queuing & Delay Analysis & Network Protocol Stack 1* [docs]
- *Queuing & Delay Analysis & Network Protocol Stack 2* [docs]
- *Multiplexing & Multiple Access Medium – IETF* [docs]
- *Application Layer Protocols; HTTP – FTP – SMTP – CDN – DNS* [docs]
- *Reliable Data Transfer; Stop & Wait Protocol* [docs]
- *Reliable Data Transfer; Go-Back-N & Selective Retransmit Protocols* [docs]

Multi-core Programming
Advisor: Prof. Mahmoud Momtazpour
- *Parallel Architectures – Speedup Metrics* [docs]
- *OpenMP – Parallelization of Matrix Computations* [docs]
- *OpenMP – Parallelization of Sort Algorithms* [docs]
- *Nvidia GPUs Architecture – Memory Types – GPU Characteristics* [docs]

Engineering Ethics
Advisor: Prof. Ali Dizani
- *A Deep Analysis of Ethical Dilemmas in Computer Engineering.* [docs]

WORK EXPERIENCE

Internship @ Arvan Cloud — Jun – Sep 2017
Web Application Development
- *HTML, CSS, PHP, Laravel, Javascript, ECMAScript, Node.js, Vue.js, React.js*

Internship @ Fandogh — Jun – Aug 2017
Mobile Application Development
- *Java, React Native*

TEACHING EXPERIENCE

T.A. @ CEIT @ Amirkabir University of Technology — Sep – Dec 2017
Microprocessors & Assembly Programming
Advisor: Prof. Mahdi Homayounpour [Resources]

T.A. @ ENG @ Kharazmi University of Tehran — Sep – Dec 2015
Foundations of Programming in C++
Advisor: Dr. Azadeh Mansouri [Resources]

HONORS

Ranked top 3 among most active **GitHub** developers in Iran. — June 2018

Admitted to **Amirkabir University of Technology** among all bachelor students at Computer Engineering Department, Kharazmi University of Tehran. — Aug 2018

Member of Executive Team at the 17'th International Collegiate Programming Contest held at the Amirkabir University of Technology. — Nov 2017

Participated in the 4'th national programming contest contest held at the Sharif University of Technology as a member of *Morph* team. — Sep 2017

Ranked top 3 among all bachelor students at Computer Engieering Department, Kharazmi University of Tehran. July 2016

Participated in the Avatech's Educational Startup Weekend held at the University of Tehran, as a member of *3-mim* team. Jun 2015

Ranked top 0.006 in the Nationwide University Entrance Exam among all students in Mathemathics and physics (approximately 250,000). July 2014

Elected as the **tidiest** student at the campus of international summer school, *Institute Monte Rosa*, Montreux, Switzerland. Aug 2011

TALKS

Automatic Image Captioning with Attention Mechanism June 2018

- Based on the paper *Show and tell: A neural image caption generator* by Vinyals, O., Toshev, A., Bengio, S. and Erhan, D.

Visual Question Answering with CNNs and RNNs May 2018

- Based on the paper *Visual question answering: Datasets, algorithms, and future challenges* by K. Kafle and C. Kanan.

Machine Learning at Scale Oct 2017

- Based on the paper *Rules of Machine Learning* by Dr. Martin Zinkevich.

Energy Awareness July 2017

- Based on the paper *Energy-aware adaptation for mobile applications* by Dr. Jason Flinn.

Metasploit Framework May 2017

- Introduction to *Metasploit Framework* & *Social Engineering* techniques.

SKILLS

Languages Persian (*native*), English (*advanced working proficiency*)

Data Science *Python, Scikit-learn, Numpy, Pandas, Matplotlib, Weka.*

Computer Vision & Deep Learning *Tensorflow, OpenCV.*

Parallel Processing Frameworks *C/C++ @ OpenMP, Intel VTune Amplifier, Intel Inspector, C/C++ @ CUDA, Nsight Monitor.*

Functional Programming *Racket, ML, Scheme.*

Hardware Design *VHDL, Verilog, HLS, AVR, ARM, Arduino, Xillinx Vivado, ModelSim, Atmel Studio, Proteus, Cadence PSpice, Keil.*

Networking *GNS3, Wireshark, Packet Tracer, Boson NetSim.*

Mobile Application Development *Java, React Native, Android Studio.*

Web Application Development *HTML/CSS, Javascript, Node.js, React, PHP, Laravel.*

Databases *PostgreSQL, MySQL, MongoDB.*

NOTABLE PROJECTS

KDEPlot, *Density Estimation*
- Implementation of 1-D and 2-D Kernel Density Estimation Methods in Python using Numpy and Matplotlib Only. [code]

KNNCC, *Image Classification*
- Implementation of a K-Nearest Neighbour *CIFAR-10* Classifier in Python. [code]

Paralab, *Parallel Processing*
- Implementation of frequent parallel problems using OpenMP and Intel Parallel Studio in C. [code]

Annealing, *Data Cleaning & Preprocessing*
- Preprocessing and training the dataset of annealing. Reached 98% accuracy with a decision tree classifier. [docs] [code]

Titanic, *Data Science & Feature Engineering*
- Prediction of Titanic survivals as a part of Kaggle competition. Reached an Accuracy of 83% and Recall of 76%. [code]

MNIST-Drawer, *Variational Autoencoder*
- Implementation of a *Variational Autoencoder* to draw *MNIST* dataset characters using *Tensorflow*. [code]

notMNIST, *Convolutional Neural Network*
- Implementation of multiple machine learning classifiers and regularization techniques on the *notMNIST* dataset using *Tensorflow*. [code]

Freeman, *Hardware Programming & Co-design*
- Implementation of a *Parking Controller* & *Security Controller* using *VHDL*. [code]

Numex, *Functional Programming*
- Implementation of an *Advanced Functional Interpreter* using *Racket*. [code]

Hornburg, *Deep Learning Basics*
- Implementation of *Principal Machine Learning Algorithms* using *Python*. [code]

Iris, *Multi-nomial classification*
- Multi-nomial classification of *Iris* dataset using *scikit-learn*. [code]

ARMHE, *Advanced RISC Machine Programming*
- Implementation of the *Histogram Equalization* algorithm on the *STMF32F407VGT6* with *ARMv4T* architecture using *ARM Assembly*. [code]

Cinder, *Low Level Programming*
- Implementation of a basic *Operating System* with *C*. [code]

Chronicle, *Compiler Design*
- Implementation of a *lexical analyzer*, *syntax analyzer* and a *partial code generator* using *Lex & Yacc* in *Java*. [code]

Sockets, *Socket Programming*
- Implementation of various types of *Sockets* in *Interprocess Communication* & *TCP/IP*

Protocol with *C*. [code]

Toofan, *Android Application Development*
- Implementation of a *Weather Forecast Application* on the *Android* platform using *Java* & *Android Studio*. [code]

Huffman, *Huffman Coding*
- Implementation of the *Huffman Text Compression Algorithm* using *Java*. [code]

2048, *C++ Programming*
- Implementation of the *2048 Puzzle Game* with various gameplay tweaks using *C++*. [code]

Manobase, *VHDL Programming*
- Implementation of the *Morris Mano's Base Computer* using *VHDL*. [code]