

REZA KARIMZADEH

Tehran-Iran

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EDUCATION

SHARIF UNIVERSITY OF TECHNOLOGY

Tehran, Iran

MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING

Sep. 2019 – Present

- **Thesis:** “Medical Images Segmentation Using Deep Learning Methods”
- **GPA:** 17.10/20

Advisor: DR. Fatemizadeh

AMIRKABIR UNIVERSITY OF TECHNOLOGY

Tehran, Iran

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING

Sep. 2014 – Sep. 2019

- **Thesis:** “Design and implementation of brain surgery bipolar electrocoagulation simulator using haptic technology.” (paper in preparation)
- **GPA:** 16.45/20

Advisor: DR. Azarnoush

SHAHID BEHESHTI HIGHSCHOOL

Shahrekord, Iran

DIPLOMA IN MATHEMATICS AND PHYSICS DISCIPLINE

Sep. 2010 – Sep. 2014

- Under the supervision of NODET (National Organization for Developing Exceptional Talents)
- **GPA:** 18.84/20

PUBLICATIONS

• JOURNAL PAPERS

- ✳ **Karimzadeh R.**, Fatemizadeh E., Arabi H.; *Shape based cost function for medical images segmentation* (to be submitted)
- ✳ **Karimzadeh R.**, Sheikh J., Azarnoush H., Arabi H.; *Design and implementation of brain surgery bipolar electrocoagulation simulator using haptic technology* (to be submitted)

• CONFERENCE PAPERS

- ✳ **Karimzadeh R.**, Fatemizadeh E., Arabi H., Zaidi H.; *Knowledge distillation: a strategy to enhance performance of deep learning-based seminal segmentation*; IEEE NSS and Medical Imaging Conference 2021
- ✳ **Karimzadeh R.**, Fatemizadeh E., Arabi H., Zaidi H.; *Prediction error propagation: A novel strategy to enhance performance of deep learning models in seminal segmentation*; IEEE NSS and Medical Imaging Conference 2021
- ✳ **Karimzadeh R.**, Rajabi N., Khodabakhsh A., Taghavi F., Fatemizadeh E., Arabi H., Zaidi H.; *X-Net: A novel deep learning architecture with high-resolution feature maps for image segmentation*; IEEE NSS and Medical Imaging Conference 2021
- ✳ **Karimzadeh R.**, Fatemizadeh E., Arabi H.; *Attention-based deep learning segmentation: Application to brain tumor delineation*; International Iranian Conference on Biomedical Engineering (ICBME 2021)
- ✳ **Karimzadeh R.**, Rajabi N., Fatemizadeh E., Arabi H.; *3D dilated and residual convolutional neural network for COVID-19 detection from the chest computed tomography*; International Iranian Conference on Biomedical Engineering (ICBME 2021)
- ✳ Rasti A., **Karimzadeh R.**, Zarei A., Ghaffari A.; *A Non-contact heart rate estimation framework based on photoplethysmography amplitude variation elimination and data fusion*; International Iranian Conference on Biomedical Engineering (ICBME 2021)

* TaghiBeyglou B., **Karimzadeh R.**, Bagheri F., Bayani A., Azarnoush H.; *New Platform for Automatic Iranian License Plate Detection and Recognition using Deep Learning Techniques*; 6th Iranian congress on Electrical and computer engineering

• BOOK CHAPTER

* Abouie V., Taghizadeh S., Froozanfar A., **Karimzadeh R.**, Shaygan S., et al.; 2021; Medical Equipment Book, chapter: *Medical Imaging systems*

SELECTED ACADEMIC PROJECTS

• NATIONAL ELITES FOUNDATION PROGRAM

* Non-contact vital signs (Heart Rate and SPO_2) measurement using RGB camera image sequence.

In this teamwork project, we design and implement many methods to capture vital signs: 1) phone app. that exploits phone camera and user fingertip for HR estimation 2) design and implement pulse-oximeter device 3) develop an algorithm for HR estimation using face video 4) design and implement a setup for HR and SPO_2 extraction from the palm image sequence.

• DEEP LEARNING

* Image captioning system using Recurrent Neural Network (RNN) and Convolutional Neural Networks (CNN) trained with coco dataset. *Deep Learning Course Project*

* Generate fake images by exploiting Generative Adversarial Networks (GAN).

* Generate fake images by exploiting Conditional Variational Auto Encoders (CVAE).

* Predict the second hemistich of Shahnameh's couplet poem (Iranian epic poem book) using Recurrent Neural Networks (RNN).

• IMAGE PROCESSING AND COMPUTER VISION

* Video Synopsis.

Computer Vision Project

Summarize long videos into a shorter time.

* Article Reproduction; "MRI noise estimation and denoising using non-local PCA"

MIAP Project

* Face Detection using Viola-Jones and HOG methods

* Implement image Stitching and panorama algorithm

• DESIGN AND IMPLEMENT OF ELECTRICAL DEVICES

* Digital Device for Measuring Blood Pressure

In this work, an electrical device was designed and implemented to inflate a medical cuff and measure blood pressure with a pressure sensor and an AVR microcontroller.

* Electrocardiograph Visualizer Device

In this work, a PCB was designed and implemented to acquiesces and amplify ECG signals from Stuck electrodes to the body.

* Digital Piano Touch Keypad

Made a piano using a touch keypad and ARM microcontroller.

* Design and Simulation of MAZE by Programming AVR

Design a simple game by AVR and implement it.

WORKING EXPERIENCE

ELECTRO-XRAY COMPANY

Summer 2017

ENGINEERING INTERN

- Becoming familiar with Repair and maintenance of imaging systems such as MRI, CT, Portable Radiology device, Angiography, C-Arm, Mammography and OPG

TEACHING EXPERIENCE

TEACHING ASSISTANT | *Deep Learning*

Fall 2021

- Department of Electrical Engineering, Sharif University of Technology

Supervisor: DR. Fatemizadeh

TUTOR | *From Basic Python to Deep Learning Coding*

Summer 2021

- Public Virtual Tutorial

TEACHING ASSISTANT | *Medical Images Analysis and Processing*

Spring 2021

- Department of Electrical Engineering, Sharif University of Technology

Supervisor: DR. Fatemizadeh

TEACHING ASSISTANT | *Medical Imaging Systems*

Spring 2021

- Department of Electrical Engineering, Sharif University of Technology

Supervisor: DR. Vosough Vahdat

TEACHING ASSISTANT | *Image Processing*

Fall 2018

- Department of Biomedical Engineering, Amirkabir University of Technology

Supervisor: DR. Azarnoush

LANGUAGES

English (Professional Working Proficiency)

TOEFL exam will be taken soon

Persian/Farsi (Native)

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Assembly

Python Selected Libraries: OpenCV, Tensorflow, Keras, Pytorch, Matplotlib, Numpy, Scipy

Software Simulators: Matlab, Simulink

Hardware Simulator: Pspice, LTspice, Proteus, Altium Designer

Microcontrollers: AVR, Arduino (CodeVision, Atmel Studio)

Typesetting: T_EX, Microsoft Office (Word, Powerpoint, Excel)

Operating Systems: Windows, Ubuntu

HONORS & AWARDS

IRAN'S NATIONAL ELITES FOUNDATION

- Being a member due to standing among top students of university

TRAINEE GRANT IN NSS AND MEDICAL IMAGING CONFERENCE 2021

- Granted for conference due to sufficient contributions

M.Sc. NATIONAL UNIVERSITY ENTRANCE EXAM

- Achieved the 80th place in the national M.Sc entrance exam in Electrical Engineering

B.Sc. NATIONAL UNIVERSITY ENTRANCE EXAM

- Ranked 694 in the top 0.3% among 222,500 students in the national university entrance exam in mathematics and physics discipline

RESEARCH INTERESTS

- Medical Image Processing
- Deep Learning
- Machine Learning
- Computer Vision
- Computational Neuroscience
- Artificial Neural Networks

HOBBIES

SPORTS: Football(Soccer), Hiking

ART: Play Setar(Traditional Iranian Instrument), Pencil Drawing

READ BOOK: Persian Poems, History, Psychology

REFERENCES

Assoc. RS. Hossein Arabi, Department of Medical Imaging, Geneva University Hospital

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Asst. Prof. Emad Fatemizadeh, Department of Electrical Engineering, Sharif University of Technology

Email: fatemizadeh@sharif.edu

Asst. Prof. Hamed Azarnoush, Department of Biomedical Engineering, Amirkabir University of Technology

Email: azarnoush@aut.ac.ir

Asst. Prof. Bijan Vosoughi Vahdat, Department of Electrical Engineering, Sharif University of Technology

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