REZA KARIMZADEH

Tehran-Iran Last Update: November 11, 2021

Personal Website | reza.kma@ee.sharif.edu | Rezakarimzadeh1996@gmail.com
+98-913-7032-066 | 0000-0003-0911-367X | github.com/rezakarimzadeh

EDUCATION

SHARIF UNIVERSITY OF TECHNOLOGY Tehran, Iran
MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING *Sep. 2019 – Present*

- **Thesis:** "Medical Images Segmentation Using Deep Learning Methods" **Advisor:** DR. Fatemizadeh
- **GPA:** 17.10/20

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) **Advisor:** DR. Azarnoush
- **GPA:** 16.45/20

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

- **COLLABORATION WITH PINLAB, GENEVA UNIVERSITY HOSPITAL**

PET INSTRUMENTATION AND NEUROSCIENCES LAB (PINLAB). link
✻ Organs at risks and Tumor segmentation with deep learning methods.
✻ COVID-19 diagnosis from CT images using deep learning.

- **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 Adverserial 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*
Summerize long videos into a shorter time.
✻ Article Reproduction; "MRI noise estimation and denoising using non-local PCA" *Image Processing 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:	TEX, 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*
Email: Hossein.Arabi@unige.ch

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*
Email: vahdat@sharif.edu