

Abbas Mazrouei Sebdani

Senior Software (BiomedicalAI) Developer | R&D Programmer at BEHYAAR Knowledge Co. | Member of ISMVIP & NBML

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I'm a biomedical AI Software developer; I'm over 5+ years of researching, developing, and programming MATLAB, Python, C++, and C languages; Also I'm developing AI & machine learning algorithms for medical devices and computer vision fields, to research and develop medical devices.

PROFESSIONAL EXPERIENCES

BEHYAAR Sanaat Sepahan Knowledge-base Co.

Feb 2021 to Present

Senior R&D | AI | Medical Image & Signal Processing | X-ray | Computer Vision | C++ | Python | MATLAB Developer

MRI Software | CT Scan Software | ProjViser Software | CARGO Software | TPS Software (RadioTherapy)

- 3D & 2D Image & Signal Processing, Computer Vision, Machine Learning & Deep Learning, and Software Designing in medical fields that included R&D on medical imaging equipment, Developing and Optimizing algorithms and networks, usually training in python, and running models in C++, my projects including different types of Radiography, CT scan, MRI, Radiotherapy Machines, and other High-tech products that related to Reconstruction, Pre-processing and Post processing to Build & Develop the Softwares.
- Site: <https://behyaar.com>

Neural Analytics

2020

Internship as a Data Scientist

- Worked on algorithms to improve the search speed and efficiency of the robotic brain scanner.
- Designed machine learning protocols to enable the robotic systems to make data-driven clinical decisions.

Freelance

May 2018 to Present

Freelance Software Developer

- Programming: Python | Matlab | C++ | C | R | Arduino | Qt | JAVA | C#
- Designing: Proteus | OrCAD | NI Multisim
- Packages: BART | ASTRA | DCMTK | ITK | TensorFlow-KERAS | Pytorch | OpenCV | Numpy | Xtensor | Matplotlib | PyDICOM | Scipy | Pandas | Dlib | Armadillo | VTK | MatRad | PyVista
- <https://github.com/abbasmzs>

Isfahan University of Medical Sciences (Medical Equipment Skill Lab)

Aug 2019 to Feb 2020

R&D Engineer

- I got involved in reverse engineering & developing with the team managed by Dr. Hossein Rabbani (Head of Department of Biomedical Engineering, Isfahan University of Medical Sciences) to designing & repairing a large number of medical devices in various fields such as medical imaging, surgery room, laboratory equipment, Etc at the Medical Equipment skill Lab of Isfahan University of Medical sciences.

Danesh Electronic Services

Nov 2016 to Jun 2017

Biomedical Engineer

I was working as a biomedical intern in the medical and dental equipment at Danesh Electronic Services.

EDUCATION

Ragheb Isfahani University of Isfahan

2016 to 2020

Bachelor of Engineering - BE

Biomedical Engineering (Bioelectronics)

- GPA: 3.7/4.0
- Site: <http://raghebisf.ac.ir/en/0>

PROFESSIONAL SKILLS

Software Developing | Machine Learning & Deep Learning | Image & Signal Processing | Image Reconstruction | Research and Development (R&D) | Computer Vision | Pattern Recognition | Artificial Intelligence (AI) | MRI Software (Medical Imaging, Image Reconstruction) | Data Science | Digital Imaging | Problem-Solving | Teamwork | Electronics | Laboratory Skills

- Programming Languages:

Python | C++ | Matlab | C | Cython | Qt | C# | Arduino

- Other Engineering software packages:

CUDA | Pspice | ITK | DCMTk | VTK | Dicompyler | CMake | MicroDicom | Visual studio | VS Code | IntelliJ IDEA | OrCAD | Borland | Proteus | Altium Designer | NI Multisim | Simulink | Microsoft Office | Latex

PUBLICATIONS & PRESENTATIONS

Medical Image Processing and Deep Learning to Diagnose COVID-19 with CT Images (3 Citation)

April 2021

IEEE

In this article two classification algorithms of computed tomography images with the purpose of detecting COVID-19 based on the local binary pattern, the GLCM features, and other extraction of statistical has been proposed to classify the chest images into two classes, COVID-19 patient and non-COVID-19 person.

- <https://ieeexplore.ieee.org/document/9483563>
- https://www.researchgate.net/publication/353486760_Medical_Image_Processing_and_Deep_Learning_to_Diagnose_COVID-19_with_CT_Images

Medical Image Processing and Deep Learning to Diagnose COVID-19 with CT Images

April 2021

Presented at University of Kashan

5th International Conference on Pattern Recognition and Image Analysis (IPRIA)

Diagnose diseases from X-rays and 3D MRI brain images

October 2019

Presented at Ragheb Isfahani University (Seminar)

AI is transforming the practice of medicine. It's helping doctors diagnose patients more accurately, make predictions about patients' future health, and recommend better treatments. This seminar detailed practical experience in applying machine learning to concrete problems in medicine.

PROJECTS

MRI Software

Jan 2022 to Present

MRI Software 1.5T {PD-w, T1-w, T2-w}; Advanced clinical technique & applications, Comprehensive scan sequences, (Including back-end & front-end). Languages: C++ - C#

Image Registration CT-MRI Software

April 2022

Image registration is the process of transforming different sets of data into one coordinate system. In this project, I used Deep Learning (CNN Networks) to register CT scan DICOM and MRI Images DICOM.

Enhancement of Radiology Images

May 2021 to Jul 2021

increasing the contrast, brightness, and density of radiology device images for clinical goals. languages: c++ - c#

Reconstruction MRI and CT scan images

Feb 2022 to Aug 2022

For both achieved several Methods; Reconstruction K-space to MR images: CS, POCS, Compressed Sensing, SENSE, DeepLearning. Reconstruction Raw data to CT images Methods: SIRT, SART, WBP, FBP. Languages: C++ - MATLAB - Python

Image Enhancement and Deep Learning Two Models to Diagnose COVID-19

Oct 2020 to Feb 2021

https://www.researchgate.net/publication/353486760_Medical_Image_Processing_and_Deep_Learning_to_Diagnose_COVID-19_with_CT_Images

Using Artificial Neural Network and Support Vector Machine to Train and Diagnose COVID-19 of the enhanced CT-Scan images in MATLAB Software.

Super Resolution and Depth of Cargo X-Ray Scans

May 2021 to Aug 2021

increasing the resolution of X-Ray images captured from cargos by a linear accelerator and using GANs & VGG19 & CNN networks in Python language to get super-resolution images. Languages: C++ - Python

Collapsed Cone Convolution (CCC) Radiotherapy Algorithm

Mar 2022 to Present

An ideal dose calculation algorithm can perfectly reflect the actual dose distribution within a real patient, which in turn reduces the uncertainty during the evaluation of treatment plans. In this project, I implemented the Collapsed-cone calculation in C++ & Cython for less run time. Languages: C++ - Cython - Python

Diagnosis Breast Cancer

Oct 2020 to Dec 2020

Using Artificial Neural Network to Diagnose Breast Cancer by using Tomography Images in MATLAB Software.

Phase Space Reconstruction for Improving the Classification of Single Trial EEG

Nov 2019 to Feb 2020

The phase space features were extracted by the amplitude-frequency analysis method in the state of space of EEG signals.

Classification of EEG Signals to Detect Epilepsy

Mar 2020 to Jul 2020

Detecting epilepsy using EEG data with MATLAB ANN.

AVR & ARM & Arduino Programming

Jan 2018 to Dec 2019

C & C++ Programming and Using the Sensors (dht11, srf05, lm35, ...) to Measure Distance and Temperature, Detection and Commissioning of Remote Systems.

HONORS & AWARDS

Obtain the Top rank in the challenge of Ophthalmic archiving software services

August 2019

Isfahan University of Medical Sciences

A team consisting of four-person who researched, programmed, and planned to create an innovative database led by me.

Achieving 2st rank in the field of biomedical engineering

2016-2020

Ragheb Isfahani University of Isfahan

I got Second rank and best student with high grades.

Achieving 1st rank in the field of biomedical engineering. (6 Semesters)

2016-2020

Ragheb Isfahani University of Isfahan

I got 1st rank and best student with high grades for 6 semesters of 8 in the university ranking.

The Best Student for 12 Academic Years with Highest Honors

2004 - 2016

Azad Shahr Grade School - Moe'emenin Magnet Junior High School - IranShahr Independent High School

LANGUAGES

Persian (Native or bilingual proficiency), **English [TOEFL score: 103]** (Professional working proficiency), **English for Healthcare [Course]** (King's College London), **Basic English 2: Pre-Intermediate [Course]** (King's College London), **Improve your IELTS Speaking score [Course]** (Macquarie University)

CERTIFICATIONS

The 1st Annual meeting of ISMRM Iranian Chapter

2022

ISMRM - Iranian chapter

Scientific sessions:

- MR Physics, Artificial Intelligence (AI) in MRI, Neuroimaging, MR in Cancer, Cardiac MR, MR Technologists (SMRT), MR in Radiotherapy
- August 24th, 25th, and 26th

MRI Simulation for Radiation Treatment Planning

June 2022

ISMRM - Iranian chapter

Comprehensive Course on Magnetic Resonance Imaging (MRI)

July & Aug 2022

National Brain Mapping Laboratory (NBML)

Scientific sessions:

- MRI Principles - MRS - DTI, DWI & DKI - PWI - FMRI
- Duration: 40 hours

6th Iranian Symposium on Brain Mapping Updates (ISBM)

July 6 & 7 - 2022

National Brain Mapping Laboratory (NBML)

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization

Mar 2022

Coursera

Structuring Machine Learning Projects

Coursera

Apr 2022

AI For Medical Diagnosis

DeepLearning.AI

Aug 2021

Neural Networks and Deep Learning

DeepLearning.ai - Coursera

Jul 2021

Fundamentals of Machine Learning for Healthcare

Stanford University School of Medicine - Coursera

Nov 2021

Machine Learning in Medical Sciences

Isfahan University of Medical Sciences

Aug 2020

Autumn School on Bilevel Optimization-ALGORITHMIC OPTIMIZATION

Universität Trier

Oct 2020

Introduction to Machine Learning with Python Programming

Isfahan University of Medical Sciences

Aug 2020

Application of Electronics in Biomedical Engineering

Isfahan University of Medical Sciences

Aug 2020

Artificial Intelligence and Deep Learning Methods in Autonomous Robotics

IEEE Iran section

Sep 2020

Ambient Intelligence for Smart Living

IEEE Iran section

Sep 2020

Computer Programming

University of Leeds

Oct 2020

Learn to Code for the Web

University of Leeds

Oct 2020

1st Isfahan Biomedical Engineering Summer School

Isfahan University of Medical Sciences

Aug 2019

Scientific sessions:

- Familiarity with vital signals
- Study and work opportunities abroad
- Medical image processing
- Neuroscience
- The role of the biomedical engineer in medical centers and hospitals
- Bioinformatics
- Medical robotics and robotic surgery
- Ophthalmology equipment
- Intermediate systems in medicine and image guidance
- Job search in the field of medical engineering

Top rank in the Ophthalmic images archive software service challenge

Isfahan University of Medical Sciences

Aug 2019

SERVICES & MEMBERSHIPS

Researcher at National Brain Mapping Laboratory (NBML)

May 2021 - Present

Researching on Brain Mapping, MRI field and providing up-to-date and knowledge services in the field of cognitive science and technology.

Researcher at ISMVIP

May 2021 - Present

Working on Pattern Recognition, Image & Signal Analysis.

Participation in 5th international conference

2021

Pattern Recognition and Image Analysis (IPRIA)

Participation in AI Finland conference

2020

It was an international virtual conference focusing on business research collaboration in AI.

IEEE Student Member

2019 - 2022

Co Editor Chief

Sep 2016 - May 2019

Scientific Association of Biomedical Engineering, Ragheb University of Isfahan

Director Of Communications And Public Relations

Sep 2016 - Dec 2017

Scientific Association of Biomedical Engineering, Ragheb University of Isfahan

RESEARCH INTERESTS

MRI | Machine Learning | Deep Learning | Reinforcement Learning | Radiation Therapy | Image & Signal Processing | Computer Vision | AI in Healthcare | Brain Mapping | Medical Imaging

REFERENCES

Dr. Mohamad Hossein Vafaie

2021

Assistant Professor of Isfahan University of Medical Sciences

Assistant Professor in Image and Signal Processing Research Center, School of advanced technologies in biomedicine.

- mh.vafaie@amt.mui.ac.ir - mh.vafaiee@gmail.com

Dr. Zahra Baharlouei

2021

Assistant Professor of Isfahan University of Medical Sciences

Assistant Professor in Image and Signal Processing Research Center, School of advanced technologies in biomedicine.

- zahra_bahar@yahoo.com - zahrabaharluei@gmail.com

Dr. Mehdi Barati

2022

Assistant Professor of Ragheb Isfahani University

Assistant Professor in Biomedical Engineering Department

- barati@raghebisf.ac.ir - mehdibaratii@gmail.com