# Neda **Sardaripour**

Biomedical & Electrical Engineer | Neuroscience Researcher
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## Research Interest

- **Biomedical image/signal processing**
  - Task-based / Resting state Brain mapping
  - Neuroimaging using MRI, fMRI, EEG, MEG
  - EEG/ECG signal processing
- **Biomedical Pattern Recognition**
- **Machine Learning**
- **Computational Neuroscience**
- **Cognitive Neuroscience**
  - Studying Human Behavior, Cognition & Language, Learning & Memory
  - Studying neurologic & neuropsychiatric disorders
- **Brain Computer Interface**
  - Movement & Rehabilitation

## Education

### K. N. Toosi University of Technology — *Tehran, Iran*

M.Sc. in **Biomedical Engineering** — *Sep. 2017 - PRESENT*

- **Thesis title:** Evaluation of visual pathways and LGN region function in Multiple Sclerosis (MS) patients using fMRI
  **Supervisor :** Prof. Hamid Abrishami Moghaddam
- Member of machine vision and medical image processing (MVMIP) lab.
- **GPA : 3.9 / 4.0** ( 18.10 / 20 ) **( Ranked student )**
- **Courses :**
  - Statistical Pattern Recognition ( 4.0 / 4.0 )
  - Digital Image Processing ( 4.0 / 4.0 )
  - Digital Signal Processing ( 3.0 / 4.0 )
  - Medical Imaging System ( 4.0 / 4.0 )
  - Functional Brain Imaging System ( 4.0 / 4.0 )
  - Physiology and Anatomy ( 4.0 / 4.0 )
  - Human Motor Control and Neural System ( 4.0 / 4.0 )
  - Medical Instrumentation ( 4.0 / 4.0 )
  - Electrophysiology ( 4.0 / 4.0 )
  - Physiological Measurement ( Audit student )

### Shiraz University — *Shiraz, Iran*

B.Sc. in **Electrical Engineering** — *Sep. 2012 - Sep. 2016*

- Specialized in Electronic Engineering
- **GPA :** 16.40 / 20

### NODET high school — *BandarAbbas, Iran*

Diploma in **Mathematics and Physics Discipline** — *Sep. 2012 - Sep. 2016*

- NODET, National Organization for Development of Exceptional Talents, are national selective Schools in Iran developed specifically for the development of exceptionally talented Students.
- GPA : 4.0 / 4.0 ( 19.60 / 20 )

# Research Experience

### Evaluating The Visual System Dysfunction of Multiple Sclerosis(MS) Patients Using fMRI

*Research Assistant*
*KNTU, Tehran, Iran*

**Master thesis**

At **Machine Vision & Medical Image Processing (MVMIP) Lab.**

*Jan. 2018 - Present*

Under the supervision of : Prof. Hamid Abrishami Moghaddam

- Investigating the functional impairments of visual pathways in subcortical and other cortical ROIs in Multiple Sclerosis (MS) patients using fMRI data during visual stimulation tasks.
- Discovering a malfunction pattern through the Lateral Geniculate Nucleus (LGN) sublayers in MS disease.

### Human Brain Imaging Using fMRI Technique

*Research Assistant*
*Tehran University, Iran*

**Data Collection**

*Jan. 2018 - Present*

At **National Brain Mapping Laboratory (NBML)**

- Collect fMRI data from two groups consist of 20 MS patients & 20 Healthy Controls.
- Designing an appropriate fMRI imaging protocol which contains thalamus and visual cortex area of the brain.
- Designing visual stimuli by PsychoPy Software showing alongside MRI imaging.

### Designing A Brain Computer Interface (BCI) To Detect Brain Functionality During Hand Movement, By Use of Machine Learning Algorithms

*Research Assistant*
*KNTU, Tehran, Iran*

A collaboration project

*Jan. 2018 - Sep. 2018*

with a Graduate student at Atrificial intelligence lab

- Role : Pre-processing and Processing the fMRI data by FSL.
- The aim of this study was detecting the orientation of hand movement in human by analysing the fMRI data to implement a hand rehabiliatation brain computer interface.

### Fast Physiological Segmentation of ECG Signal Based on Piecewise Linear Approximation

*Research Assistant*
*KNTU, Tehran, Iran*

A collaboration project

*Jun. 2018 - Sep. 2018*

with a Ph.D. student at Computational Biomedicine Lab, University of Delaware, USA

- Role : collaborating in implementation of signal segmentation's method.
- The aim of this study was segmentation and delineation of the ECG signal by extracting the significant points such as P, Q, R, S, and T, and representing the abnormalities occurred in patients.

# Teaching & Work Experiences

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|---|---|---|
| Present | **Teaching Assistant**, Statistical Pattern Recognition course<br>• Prof. Hamid Abrishami Moghaddam | *KNTU, Tehran, Iran* |
| 2019 | **Teaching Assistant**, Digital Image Processing course<br>• Prof. Hamid Abrishami Moghaddam | *KNTU, Tehran, Iran* |
| 2019 | **Teaching Assistant**, Functional Brain Imaging System course<br>• Dr. Ali Khadem | *KNTU, Tehran, Iran* |
| 2018 | **Workshop**, Pre-process & Process of fMRI data using FSL | *KNTU, Tehran, Iran* |
| 2017 | **Apprenticeship**, in Pasteurno Hospital as a biomedical engineer | *Tehran, Iran* |

# Honors & Achievements

- **Ranked Student In MSc.**

  One of the Top 3 students among other 18 students in Biomedical engineering program at K. N. T. U.

- **Author of Task-Related Brain fMRI Dataset**

  After design of fMRI imaging protocol and visual stimulation task, I have built a fMRI dataset consisting of 20 MS patients and 20 Control people. This work is done by collaboration of Iranian Multiple Sclerosis Association and NBML.

## Publications

- **Neda Sardaripour**, Alireza Sedghi, Ali Yoonessi, Ali Khadem, Hamid Abrishami Moghaddam,*"Assessment Of Functional Disorders Of Magno, Parvo And Konio-Cellular Pathways In MS Patients Using fMRI"*, Iranian Journal of Biomedical Engineering, January 2019, Doi: 10.22041/IJBME.2019.91397.1391

- **Neda Sardaripour**, Mehrdad Asadi, Ali Khadem, Reza Rajimehr, Hamid Abrishami Moghaddam,*"Improving The Assessment Of Functional Damage In The LGN Region And Visual Cortical Areas In Multiple Sclerosis"*, NeuroImage [To be submitted]

- Arash Sayareh, Ali Ahmadi, **Neda Sardaripour**, *"Designing A Brain Computer Interface (BCI) To Detect Brain Functionality During Hand Movement Using FMRI"*, [To be submitted]

## Skills

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|---|---|
| **Programming** | **Python, C/C++** |
| **Softwares and Tools** | **FreeSurfer, FSL, MATLAB, PsychoPy, MRIcron, itk-SNAP, SPM, ExploreDTI, Nordic, JMRUI, EEG-LAB, SPSS, Latex, Code Vision, Altium Designer, PSpice, Multisim** |
| **OS** | **Linux, Windows** |
| **Languages** | **Persian (Native), English (Fluent), Deutsch (Intermediate)** |

## Certificates

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|---|---|---|
| Nov. 2019 | **— Teaching Assistant workshop**, Training TAs for all skills | *KNTU, Tehran* |
| Sep. 2019 | **— Diffusion, Perfusion and MRS imaging and Data processing**, from theory to practice | *NBML, Tehran* |
| Jan. 2019 | **— MRI and fMRI data analysis in Freesurfer** , Data pre-process and process | *NBML, Tehran* |
| Oct. 2018 | **— The functional and structural MRI precessing in FSL and SPM**, 5th Iranian Human Brain Congress | *SBU, Tehran* |
| Nov. 2017 | **— MRI & fMRI DATA acquisition skills**, from theory to practice | *NBML, Tehran* |

## Projects

**Implementation of Forward and Inverse EEG & MEG Problems With MATLAB** — *KNTU, Tehran, Iran*

Final project of Functional Imaging System course — *2017*

- Calculate the amount of signal which receive with each EEG and MEG sensor.
- Find the location of the signal that is responsible for the measured EEG and MEG data.

**A Review Research on Cerebral Palsy Disorder** — *KNTU, Tehran, Iran*

Final project of Human Motor Control course — *2017*

- The information of this report is used in producing a complete training video for prevention, rehabilitation and treatment for Cerebral Palsy patients by a clinical expert group

**Implementation of High Bit-Depth Medical Imaging Compression With HEVC** — *KNTU, Tehran, Iran*

Final project of Digital Image Processing course — *2017*

- A comparison between JPEG 2000 and HEVC method for medical image compression

**Implementation of A Remote Control Camera Via WiFi** — *Shiraz Uni. Iran*

Undergraduate Project — *2017*

- Design and implement an android application which connects to the camera on a robot to receive image and video.

**Control The Robot Motion Via Bluetooth** — *Shiraz Uni. Iran*

A collaboration project for microprocessor Lab. — *2016*

- Implementing a control system to determine the direction of robot's movement by commands

# Refrences


**Professor Hamid Abrishami Moghaddam** — *KNTU, Tehran, Iran*

Full Professor, Faculty of Biomedical Engineering, K.N.Toosi University of technology — *My MSc. Thesis Supervisor*

- Email: moghaddam@kntu.ac.ir
- Personal Webpage: http://wp.kntu.ac.ir/moghaddam

**Dr. Reza Rajimehr** — *Cambridge, England*

Research Scientist, McGovern Institute for Brain Research, Massachusetts Institute of Technology, USA & University of Cambridge, England — *My MSc. Thesis Advisor*

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- Email2: rajimehr@mit.edu
- Email3: rajimehr@gmail.com
- Personal Webpage: http://www.mit.edu/~rajimehr/

**Dr. Ali Khadem** — *KNTU, Tehran, Iran*

Assistant Professor, Faculty of Biomedical Engineering, K.N.Toosi University of technology — *My MSc. Thesis Advisor*

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**Dr. Mehdi Delrobaei** — *KNTU, Tehran, Iran*

Assistant Professor, Faculty of Biomedical Engineering, K.N.Toosi University of technology — *Faculty Member*

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