

# Sepand Ali Madad Soltani

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## Education

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### K.N. Toosi University of Technology

Bachelor of Science in Electrical Engineering

Concentration: **Electronics Engineering**

GPA: 16.26/20 (Last two years: 17.29/20)

GPA 4.0 scale: 3.37 (Last two years: 3.72)

Tehran, Iran

**Anticipated** in February 2023

## Academic Projects

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### Automated fMRI Preprocessing and Timeseries Extraction Pipeline for Large Datasets using FSL in Python

Summer 2022

- Implemented brain extraction from structural reference MR image
- Implemented fMRI preprocessing including motion correction, slice timing correction, spatial smoothing and co-registration
- Implemented ROI timeseries extraction based on any atlases
- Implemented multiprocessing for all steps

### Detection of Alzheimer's Disease Patients using Deep Neural Network based on fMRI Functional Connectivity

Summer 2022 (Ongoing)

- Studied the previous works on this subjects for finding the gap (Still early stages of the project)
- Preprocessed the raw fMRI data using the FSL library

### Tetris AI bot using Deep Reinforcement Learning

Summer 2022 (Ongoing)

- Developed the game from scratch using C++
- Created a custom C++ to Python API for the game using Pybind11 library
- Developed a Deep Q learning agent for training the AI to play the game

### The Game of Tetris with a Custom Game Engine Using OpenGL in C++

Spring 2022

- Developed a custom 2D graphics renderer completely from scratch using the OpenGL graphics API in C++
- Added game functionalities, menus and text rendering capabilities to the engine
- Designed and implemented the game of Tetris using the said engine in Object Oriented C++

### Implementation of Synthesizable A\* Search Algorithm in FPGA-VHDL

Spring 2021

- Developed a synthesizable VHDL code for A\* algorithm capable of solving any 10x10 mazes
- Developed a python script for generating random mazes
- Simulated and tested the algorithm for solving random mazes using VHDL test bench

### Smart Temperature Detection PCB Circuit Design

Summer 2020

- Designed circuit schematic and PCB layout using Altium designer  
(Key components: ATMEGA64 and SIM800C)

### Calculating the Magnetic Field Caused by a Spherical Solenoid

Winter 2019

- Derived the formula for the magnetic field caused by a spherical solenoid
- Calculated and graphed the magnetic field on multiple plates
- Integrated the graphs and the calculator in a custom GUI developed using MATLAB App Designer

## Skills

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- Programming Language: C++, Python, MATLAB, VHDL, AVR C
- Software: PSpice, Proteus design suite, Altium Designer, FMRIB FSL library
- Hardware: Arduino, Various wireless communication modules (BLE, RF, GSM, IR and ESP8266)

- Language: Persian(Native), English(Fluent), French(Intermediate-A2)
- Online Courses and Certificates: Certificate of MATLAB from Sharif University, Certificate of Altium Designer from K.N. Toosi University of Technology

## Work Experience

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ETS, University of Quebec  
Remote Research Assistant

Montreal, Canada  
Winter 2022

- Assisted in a project aiming to predict multiple cognitive traits and performances based on EEG using Deep Convolutional Neural Networks

Razeq Co.  
Electronics Engineer Internship

Tehran, Iran  
Summer 2021

- Researched the design and development process of a parametric speaker (directional speaker) and examined the feasibility of manufacturing it
- Implemented smart presence detection and remote-control support for the monitor stand in Valiasr Street Museum
- Developed and assembled various hardware for installation in Iran's pavilion in Dubai Expo 2020 (Electric control panel, wiring, lighting and presence detection system)