

# Ahmet Kaymak

Email: [ahmet.kaymak@santannapisa.it](mailto:ahmet.kaymak@santannapisa.it)  
LinkedIn: [www.linkedin.com/in/ahmetkaymak](http://www.linkedin.com/in/ahmetkaymak)  
Address: Pisa, IT

## Education

**PhD in BioRobotics** **OCT 2021 – Present**  
Scuola Superiore Sant'Anna di Pisa Pisa, IT

- The member of Computational Neuroengineering Laboratory
- Research on neural dynamics and advanced data analyses in basal ganglia for movement disorders such as Dystonia, Huntington and Parkinson diseases

**MSc in Bionics Engineering** **SEP 2019 – OCT 2021**  
Scuola Superiore Sant'Anna di Pisa Pisa, IT

- The program is offered jointly by Sant'Anna School of Advanced Studies, University of Pisa, and IMT School for Advanced Studies Lucca (Neuroengineering Specialization)
- The thesis called "Finding Optimal GPi Target for DBS in Dystonia Through Microelectrode Recording Analysis" is completed under the advisory of Dott. Alberto Mazzoni and Matteo Vissani.
- Final GPA: 110 / 110

**BSc in Biomedical Engineering** **SEP 2015 – OCT 2018**  
Fatih Sultan Mehmet Vakıf University Istanbul, TR

- Final GPA: 3.19/4.00 – Top %5 in class of 2018 (Double Major Degree)

**BSc in Computer Engineering** **SEP 2012 – JUL 2017**  
Fatih Sultan Mehmet Vakıf University Istanbul, TR

- Final GPA: 3.60/4.00 – Valedictorian in class of 2017
- The thesis called "Vitae: Health Based Social Media Platform" is completed under the advisory of Asst. Prof. Ali Nizam

## Experience

**Machine Learning Specialist** **SEP 2018 – SEP 2019**  
IHS Technology R&D Istanbul, TR

- Predictive analysis on mail dataset to forecast spam scenarios to optimize the company's bulk mail product.
- Development of fraud detection system with transactional pattern analysis using advanced clustering algorithms.
- All documentation management of R&D projects for the national funding programs of KOSGEB and TUBITAK.

**Student Assistantship** **SEP 2015 – JUN 2016**  
Fatih Sultan Mehmet Vakıf University Istanbul, TR

- Computer Programming I, Computer Programming II, Data Structures courses assistance in software laboratories.

**Software Engineer Internship** **JUL 2015 – SEP 2015**  
Baykar Technology Istanbul, TR

- Autonomous system design for activity detection system of prototyped electrocardiogram machine.

## Qualifications

### Data Science, Machine Learning & AI

- Strong knowledge and hands-on experience of regression models, clustering models, model evaluation and pattern mining, neural networks, deep learning algorithms and their optimizations, neural coding and dynamics
- Strong theoretical and practical knowledge of MLP, RBF, RNN, Echo State Networks, Liquid State Machines, reservoir computing
- Theoretical knowledge of genetic algorithms, fuzzy systems, self organizing networks and stochastic signal processing
- Electrophysiological signal analysis (LFPs, microelectrode recordings, fMRIs)

## Programming

- Extensive knowledge of OOPs; Java, Python
- Scientific Programming Platforms; Matlab, Labview, Octave
- Basic knowledge of C, C#, C++, ARM Assembly, MIPS
- Project-based knowledge of Android and Node Js
- SQL Languages: Mysql, Oracle DB, Postgresql and familiarity to ORM usage
- Strong ability in relational database design

## Project Management

- Strong familiarity in software project development models
- Hands-on experience in functional requirement analysis, risk analysis, project scope management, project timeline design and their documentations

## Projects

### Finding Optimal GPi Target for DBS in Dystonia Through Microelectrode Recording Analysis | 2020 – 2021

- The master thesis at MSc in Bionics Engineering under the supervision of Assistant Professor Alberto Mazzoni and Matteo Vissani at Computational Neuroengineering Laboratory of Scuola Superiore Sant'Anna di Pisa with the collaboration of Istituto Neurologico Carlo Besta in Milano. The project aims to find the most optimal target inside GPi nucleus of basal ganglia for the Deep Brain Stimulation treatment of Dystonia patients. The Microelectrode recordings were collected by 10 different dystonics patients. A set of neural biomarkers that can differentiate inside dystonic GPi in different depth levels are generated with advanced signal processing methods both in frequency and time domains.

### Human Activity Recognition with Leaky Echo State Networks | 2020

- A human activity recognition system based on the article "Human activity recognition using multisensor data fusion based on Reservoir Computing" with sequential data based on 7 different types of human activity in 88 sequences. A leaky echo state network algorithm implemented both for RSS based AReM and Heterogenous AReM approached stated in the paper with cross-validation based hyperparameter optimization. The project completed as a term project for Computational Neuroscience module of Applied Brain Science course.

### Real Time Shape Recognizer Based on Izhikevich Neuronal Model | 2019 – 2020

- A real-time neuronal decoder was implemented with non-adaptive, regular spiking of Izhikevich Neuronal Model for recognizing the shapes in real-time. Neuronal features used based on the working principle of calcarine sulcus in the occipital lobe of mammal brains for encoding and decoding phase of decision tree algorithm. The project completed as a term project of Neuromorphic Engineering course.

### EOG Based Keyboard Design for Locked-In Syndrome | 2018

- Python-based interactive keyboard design controlled by using eye movement signals (electrooculogram). Circuit designs and algorithms developed by the research group.

### Vitae | 2017 – 2018

- Computer Engineering bachelor thesis; health-based social media platform for patients, doctors, hospital and foundations. It matches the patients with the other patients with a similar background with machine learning approaches and connects them with the most suited hospitals and doctors according to their health problems. Trademarked in Turkey.

### World Healthcare Index | 2017 – 2018

- The project aims to compare countries healthcare system with different datasets which are taken from the World Bank dataset library. In project countries ranked with using several types of clustering algorithms, PCA analysis methods, feature correlations, data preprocessing and several regression models.

## Honors & Awards

- Scuola Superiore Sant'Anna di Pisa PHD Scholarship holder
- Borsa di Eccellenza (Excellence Scholarship): Recipient of the prestigious scholarship of the University of Pisa which awarded to the highest-ranking non-EU students in admission result of each English master degree program in 2019/2020 academic year, 2019
- TUBITAK 2242 University Student Software Project Contest Finalist, 2018
- Honor student at Department of Biomedical Engineering, FSMVU, 2018
- Valedictorian of Department of Computer Engineering Class of 2017
- Best Bachelor Thesis at Department of Computer Engineering FSMVU, 2017
- High honor student at Computer Engineering, FSMVU, 2017
- Academic Merit Fellowship FSMVU, 2015 – 2017