

# Baris Nasir

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## Education

2017

**Ph.D. Computer Engineering**, Middle East Technical University, Ankara, Turkey.  
**Thesis Advisor:** Fatos T. Yarman Vural, Prof.

2014  
2017

**M.Sc. Computer Engineering**, Middle East Technical University, Ankara, Turkey.  
**Thesis Advisor:** Fatos T. Yarman Vural, Prof.  
*GPA:* 3.71/4.00

2010  
2014

**B.Sc. Computer Engineering**, Middle East Technical University, Ankara, Turkey.  
**Advisor:** Sinan Kalkan, Assoc. Prof.  
*GPA:* 3.07/4.00

## Experience

2014

**Research and Teaching Assistant**, Middle East Technical University, Ankara, Turkey.

2013  
2014

**Part-time Software Engineer**, Software Research and Development Consultancy, Ankara, Turkey.

*Main Projects:*

- ITEA2 (TEYDEB) RECONSURVE: A Reconfigurable Surveillance System with Smart Sensors and Communication
- Pickr.us: A social web application

2012

**Intern Software Engineer**, TaleWorlds Entertainment, Ankara, Turkey.

*Main Project:*

- Mount & Blade II: BannerLord

2012

**Student Assistant**, Middle East Technical University, Ankara, Turkey.

*Course:*

- 2012/Spring, CENG230: Introduction to C Programming

## Teaching Assistantship Experience

- 2018/Spring CENG492: Computer Engineering Design II
- 2017/Fall CENG491: Computer Engineering Design I
- 2017/Spring CENG492: Computer Engineering Design II
- 2016/Fall CENG491: Computer Engineering Design I
- 2016/Spring CENG140: Advanced programming with C
- 2015/Fall CENG466: Fundamentals of Image Processing
- 2015/Fall CENG230: Introduction to C Programming
- 2015/Spring CENG336: Introduction to Embedded Systems
- 2014/Fall CENG331: Computer Organization

## Research Projects

2014  
2017

**CEREBRA**, *In this project, under the guidance of my adviser, I developed a new tool, CEREBRA, to visualize the brain network extracted from the fMRI data as a network. The tool aims to visualize the selected voxels as the nodes of the network and the edge weights are estimated by modeling the relationships among the voxel time series as a set of linear regression equations. The tool simplifies the network by built-in processors of graph reduction algorithms to display various properties of the network. It is also capable of space-time representation of the dynamically changing voxel intensity values, by animating the 3D voxel time series.*

2017

**Energy Efficient Additive Neural Network**, *In this work, we proposed a new energy efficient neural network with the universal approximation property over space of Lebesgue integrable functions. The neural structure is based on a novel vector product definition, called ef-operator, that permits a multiplier-free implementation. In ef-operation, the "product" of two real numbers is defined as the sum of their absolute values, with the sign determined by the sign of the product of the numbers. I have took part on implementing the new method using TensorFlow and tested it on various dataset.*

2015  
2016

**Multi-layered Cognitive Learning Model**, *In this project we designed a hierarchical machine learning model for human cognitive processes (such as memory, learning and emotion). For this purpose, we developed a hierarchical learning-memory model based on the recorded fMRI data. My task was the classification of fMRI data using fuzzy clustering methods and providing a meaningful visualization of the neural data. Specifically, I have used Fuzzy Stacked Generalization methods (fuzzy kNN and majority voting) for the classification part and my visualization tool to visualize the resulting network.*

2014  
2015

**Local Voxel Networks for Modeling and Classification of Brain Activity During Cognitive Processing, Using Brain Signals**, *In this project, we proposed a model, called Local Voxel Networks that could be used to classify neural activity assessed by fMRI during cognitive operations. Compared to the classical approaches for brain decoding tasks, proposed Local Voxel Network model provides better representation power. I have run common machine learning algorithms on the representation learned by the proposed model, in order to see which algorithm performed the best.*

2015

**Diagnose Schizophrenia Using Multimodal Features From fMRI Scans**, *We have completed this project within the scope of graduate "Machine Learning" course. In this project, our aim was to analyze the data, preprocess it and compare the performance of several classification methods. I have implemented the feature selection, some ensemble learning methods and artificial neural network with back-propagation parts of the project using python scikit-learn library and C++. The data was taken from Kaggle and we beat the best performance listed on the website.*

2014

**Normalized Cut Implementation with CUDA**, I have carried out this project within the scope of graduate "Applied Parallel Programming on GPU" course. In this project, I have re-implemented the well known normalized cut algorithm to perform the matrix operation parts faster. However, since the CUDA version at that time did not provide build-in matrix operations, I have used some external libraries to perform the task and had to debug some parts of those libraries. This project could be re-implemented using the CUDA version 7 or later using the build-in matrix operation functions..

## Conference Publications

2017

Afrasiyabi, Arman, Baris Nasir, Ozan Yildiz, and Fatos T Yarman Vural. "An Energy Efficient Additive Neural Network". In: *2017 25th Signal Processing and Communication Application Conference (SIU)*. IEEE, In-print.

2016

Nasir, Baris and Fatos T Yarman Vural. "CEREBRA: A 3-D visualization tool for brain network extracted from fMRI data". In: *Engineering in Medicine and Biology Society (EMBC), 2016 IEEE 38th Annual International Conference of the*. IEEE, pp. 1147–1150.

2016

Nasir, Baris and Fatos T Yarman Vural. "Simplification and visualization of brain network extracted from fMRI data using CEREBRA". In: *Cognitive Informatics & Cognitive Computing (ICCI\* CC), 2016 IEEE 15th International Conference on*. IEEE, pp. 174–181.

## Achievements

2017

**IEEE SciVIS**, Program Committee Member.

2014

**TÜBİTAK (The Scientific and Technological Research Council of Turkey)**, Senior Software Project Competition, Second place.

## Languages

Turkish **Native**

English **Fluent** TOEFL Score: 101 (Reading: 27, Listening 24, Speaking: 22, Writing: 28)

## Skills

**Languages** C, C++, Python, OpenGLSL,

**Tools** Microsoft Visual Studio, Qt Creator, Git (Gitlab, Github)

**Libraries** Keras, CUDA, TensorFlow, (Cu)BLAS, OpenGL

## Personal Interests

Music Guitar, Harmonica, Recording and Mixing

Gaming Video Games, Board Games, Jigsaw Puzzles