

Adnan M. Niazi

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Research Interests

Bioinformatics; Multi-omics Data Integration; Systems Biology; Deep Learning

Employment

- 04/2014–02/2018 **Institute of Integrative Biosciences, CECOS University, Pakistan**
Lecturer
- 09/2012–03/2013 **Centre for Artificial Intelligence, Radboud University, The Netherlands**
Research Assistant
- 08/2011–08/2012 **Donders Institute for Brain, Cognition and Behaviour, The Netherlands**
Software Engineer Trainee
- 04/2010–07/2010 **N-W.F.P. University of Engineering and Technology, Pakistan**
Lecturer
- 11/2009–03/2010 **Advanced Engineering and Research Organization Pakistan**
Assistant Manager
- 11/2008–11/2009 **Department of Electrical Engineering, CECOS University, Pakistan**
Laboratory Engineer

Education

- 2010–2012 **University of Twente, The Netherlands**
MSc Human Media Interaction (*Cum Laude* — GPA: 8.4/10)
Thesis | Real-time fMRI Decoding: Reading Minds Using Brain Imaging
Advisors | Dr. Marcel van Gerven and Dr. Mannes Poel
- 2004–2008 **N-W.F.P. University of Engineering and Technology, Pakistan**
BSc Electrical Engineering (GPA: 3.87/4.0)
Thesis | Design of EEG Data Acquisition System for Brain-Computer Interfacing

Publications

- 2014 **Niazi, A.M.**, van den Broek, P.L.C., Klanke, S., Barth, M., Poel, M., Desain, P., & van Gerven, M.A.J. (2014) Online decoding of object-based visual attention using real-time fMRI. *European Journal of Neuroscience*, 39, 319-329.
PMID: 24438492
doi: 10.1111/ejn.12405

Skills

RNA-seq — Kallisto, Bedtools, Samtools

Scripting — Bash

Pipeline management — Nextflow (Beginner Level)

Containers — Docker, BioContainers (Beginner Level)

Unix/Linux Experience — MAC OSx, CentOS, Ubuntu

Programming — Python, R, MATLAB, C++, LabVIEW, Verilog HDL

Code Development Tools — Git, Travis CI

Machine Learning Libraries — TensorFlow (Beginner Level), Donders Machine Learning Toolbox

Machine Learning Techniques — SVM, LDA, Elastic Net

Regression Techniques — GLM, Real-time GLM (Recursive least square GLM)

Dimensionality Reduction Techniques — PCA, t-SNE

Web Development — HTML, CSS, Sass, Neat, Bootstrap, JavaScript, jQuery

Digital Typesetting — Latex, LyX, Markdown

Miscellaneous — PyQt GUI Design, Shiny App Design, Bioconductor (Beginner level)

Tools Developed

Analyze4D 2012

fMRI Visualization and Voxel Time-course Analysis Tool

I developed this MATLAB[®]-based tool to intuitively visualize and do region-of-interest and voxel time-course analysis of fMRI and real-time fMRI data.

www.analyze4d.com

Donders Real-time

fMRI 2011

A General Purpose Pipeline for Brain Decoding and Neurofeedback Studies

Together with colleagues at Donders, I developed the real-time functional magnetic resonance imaging pipeline to retrieve, preprocess, and decode fMRI brain scans in real time for neurofeedback studies.

<http://tiny.cc/rtfmri>

Awards and Honors

2016

Bronze Medal in iGEM 2016 Competition

Team iGEM Peshawar 2016 — the first ever iGEM Team from Pakistan

2016

Best Teacher Award

CECOS University of IT and Emerging Sciences, Pakistan

2012

Graduated *Cum Laude* with MSc in Human Media Interaction

University of Twente, The Netherlands

2012

Nominated for Best Master's Thesis Award

ENIAC, University of Twente, The Netherlands

2011

Best Poster Award

4th BrainGain Conference, Maastricht, The Netherlands

2010

UTS Scholarship for Postgraduate Studies

University of Twente, The Netherlands

2004

Scholarship for Undergraduate Studies

N-W.F.P. University of Engineering and Technology, Pakistan

Professional Trainings

Introduction to Biology: The secret of Life

edX MOOC | MIT

Learned the fundamentals of genomics, molecular biology, biochemistry, and the recent breakthrough methods such as CRISPR for genome editing

Algorithms for DNA Sequencing

Coursera MOOC | John Hopkins University

Learned the different algorithms and data structure used in genomics assembly and alignment

Microbiome Discovery

University of Minnesota Online Course by Prof. Dan Knights

Learned about the basics of microbiomics and tools for analysis of 16S rRNA-seq data analysis

Research Experience

08/2011–02/2012

Master's Internship | Development of Real-time fMRI (rtfMRI) Pipeline at Donders Institute [pdf]

Aims and Significance: Functional MRI scanners are designed to output their acquired images only when a scanning session has completed. This is fine for most neuroscience studies that involve post-hoc data analysis, but for neurofeedback experiments — studies in which a subject's current brain activity is used to present a feedback so that the subject may consciously modulate his subsequent brain activity — scans are needed while they are being acquired by the scanner. To address this need, an rtfMRI pipeline was designed that extracted these scans from the MRI scanner on-the-fly during a scanning session. The rtfMRI pipeline I developed now forms an integral component of fMRI-based neurofeedback studies conducted at the Donders Institute.

Contributions: I co-developed the rtfMRI pipeline, and designed and conducted experiments on it to validate and test its performance.

03/2012–08/2012

Master's Thesis | Real-time fMRI Decoding: Reading Minds Using Brain Imaging [pdf]

Aim: To use machine learning on functional MRI scans of the visual cortex to decode in real time what a human subject is currently seeing or imagining.

Significance: Brain reading — as it is commonly called — was previously shown to work in an offline setting, but we demonstrated a computationally efficient real-time neurofeedback system for decoding human perception on a moment-to-moment basis.

Contributions: I designed experiments, collected data, analyzed it, and wrote a peer-reviewed journal article.

09/2012–03/2013

Research Assistantship | Investigating Neurofeedback Strategies for Conscious Modulation of Brain Activity

Aims and Significance: I designed real-time fMRI neurofeedback experiments to understand how subjects can consciously modulate their brain activity. Because fMRI scanners are costly to operate, I was also responsible for optimizing the real-time fMRI experiments and then presenting them to the institutional review committee for approval of the scanner time.

Poster Presentations

- 2013 **Donders real-time fMRI: A MATLAB-based solution for real-time fMRI decoding and neurofeedback studies** [pdf]
5th BrainGain Consortium Conference, Nijmegen, The Netherlands, 19 March, 2013.
- Analyze4D: A tool for fMRI visualization and voxel time-course analysis** [pdf]
5th BrainGain Consortium Conference, Nijmegen, The Netherlands, 19 March, 2013.
- What are you looking at? Online decoding of object-based visual attention using real-time fMRI** [pdf]
5th BrainGain Consortium Conference, Nijmegen, The Netherlands, 19 March, 2013.
- 2011 **Mind Reading: Decoding human visual perception and imagination** [pdf]
4th BrainGain Consortium Conference, Maastricht, The Netherlands, 20 December, 2011.
🌟 Winner of the Best Poster Award

Media

- 2013 **Real-time fMRI Decoding: Reading minds using brain imaging** [pdf]
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Teaching

Undergraduate

Introduction to Programming in Python — Spring 2017; Spring 2016; Spring 2015
Statistics with R — Spring 2017; Spring 2016
Introduction to Computer Science — Fall 2016; Fall 2015; Fall 2014
Electrical Network Analysis — Fall 2016; Fall 2015; Fall 2014
Measurements and Instrumentation — Spring 2017; Spring 2016; Spring 2015
Introduction to Semiconductor Devices — Spring 2014
Digital Signal Processing with LabVIEW — Spring 2009
Communication Systems — Fall 2010

Graduate

Python Programming and GUI Design — Spring 2017; Spring 2016
[🔗 adnaniazi.com/my-courses](https://adnaniazi.com/my-courses)

Workshops Conducted

- Apr 04, 2017 **Python Programming for Life Scientists**
Shaheed Benazir Bhutto Women University, Peshawar, Pakistan
- Dec 31, 2016 **Python Programming for Life Scientists**
ISCB Regional Student Group Pakistan, CECOS University, Pakistan
- Apr 30, 2016 **Python Programming for Everybody**
NXTGEN 2016 Workshop Series, Basecamp Peshawar 2.0, Pakistan
- Mar 12, 2016 **Python Programming for Biologists**
Decoders, Institute of Integrative Biosciences, CECOS University, Pakistan

References

Marcel van Gerven, PhD

Associate Professor and PI
Computational Cognitive Neuroscience Lab
Donders Institute for Brain, Cognition and Behaviour
Radboud University Nijmegen, The Netherlands.

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Mannes Poel, PhD

Assistant Professor
Department of Computer Science
Human Media Interaction Group
University of Twente, The Netherlands.

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Faisal F. Khan, PhD

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CECOS University, Pakistan.

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