Agah Karakuzu, Ph.D.

Biomedical Engineer

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STATUS Permanent Resident of Canada

WORK EXPERIENCE

NeuroPoly (CA)

Biomedical Engineering, Polytechnique Montreal

Feb. 2022 - **Present** - *Postdoctoral Fellow*

Jan. 2017 - Feb. 2022. - *Ph.D. Scholar*

Advisor: Prof. Nikola Stikov

- Obtained Ph.D. degree (02-'22)
- Standardization of quantitative MRI (qMRI)
- Vendor-neutral MRI pulse sequences (VENUS)
- A global data standard for quantitative MRI (BIDS)
- Open-source qMRI (qmrlab.org)
- Reproducible preprint server (neurolibre.org)

Biomechanics Laboratory (TR)

Institute of Biomedical Engineering

Boğaziçi University - *Project Assistant*

September 2013 - 2017

Advisor: Prof. Can A. Yucesoy

- Obtained M.Sc. (06-'15) and Ph.D. degrees (02-'23)
- Musculoskeletal MRI methods development
- Implemented medical image analysis methods
- Prepared journal and conference articles
- Conducted intra-operative experiments

VAVLAB (TR)

Electrics and Electronics Engineering Dep.

Boğaziçi University - *Project Assistant*

March 2014 - 2017

Advisor: Assoc. Prof. Burak Acar

- Managed collaboration with Biomechanics Lab
- Developed software for the volumetric analysis and visualization of musculoskeletal MRI data using diffusion tensor tractography and elastic image registration methods.

SOFTWARE DEVELOPMENT

qMRLab *Object-oriented design and development in MATLAB to develop open-source software for qMRI*

GitHub for versioning and collaboration, *Azure pipelines* for compiling the software along with the *MATLAB runtime* into *Docker* images, *GitHub Actions* for testing, *Sphinx* for automated documentation.

Deployed qMRLab to the cloud using *BinderHub*, enabling its integration with polyglot Jupyter Notebooks that run multiple kernels. This setup allowed the use of Python-powered interactive visualization tools alongside qMRLab modules in Octave syntax, pioneering the publication of tutorials with live-compute.

VENUS *Data-driven and container-mediated workflows for fully vendor-neutral qMRI in human brain*

RTHawk (proprietary SDK by Vista AI Inc.) for developing vendor-neutral pulse sequences in *C++ and JavaScript*, interfaces for GE and Siemens scanners for multi-site deployment of the sequences, and *Docker and Nextflow* for automated post-acquisition image reconstruction and processing.

Developed a modular nextflow.io pipeline that integrates with RTHawk's data stream to parse raw data, reconstruct images, preprocess data, and compute quantitative parameters. Each process was executed in its own container for runtime isolation and reproducibility. This pipeline followed the qMRI-BIDS, a global data standard that I led the development of with more than 30 researchers across the globe.

NeuroLibre *A unique ecosystem of web applications to publish reproducible preprints with live compute and data*

The NeuroLibre tech stack includes two *Ruby on Rails* applications deployed on *Heroku* for journal management (neurolibre.org) and technical reviews (robo.neurolibre.org). It also comprises two full-stack servers (preview & preprint) developed using *Flask+Celery+Nginx* to provide APIs for building and hosting published interactive preprints in the format of *JupyterBook* or *MyST* web pages.

Additionally, the stack features two *Terraform* automated *BinderHub Kubernetes* deployments on baremetal *OpenStack* (public & production) to provide live compute support, a *private docker registry* behind *Traefik*, and an array of GitHub Actions to handle content registration for scholarly publishing and other auxiliary tasks that integrate with the publishing workflow. I was responsible for designing, developing, deploying, and maintaining all these resources, which enabled the publication of more than 12 interactive preprints and established NeuroLibre as the first fully-reproducible preprint platform.

EDUCATION

Polytechnique Montreal (CA)

Ph.D. in Biomedical Engineering
January 2017 - February 2022

Boğaziçi University (TR)

Ph.D. in Biomedical Engineering *
September 2015 - February 2023

M.Sc. in Biomedical Engineering
September 2013 - June 2015

Erciyes University (TR)

B.Sc. in Biomedical Engineering
September 2009 - July 2013
CGPA of **3.28** | 4.00
Cum Laude

LANGUAGES

Turkish (Fluent)

English (Fluent)

French (Beginner)

SCIENCE COMMUNICATION

ISMRM's MR Pulse Blog
Developer

MRM Highlights
Contributor

OHBM Blog
Contributor

LEADERSHIP

MRathon (MRI Hackathon)

BrainHack (Hackathon)

MRI Together (Workshop)

Open MRB (Workshop)

MEMBERSHIP

OHBM (2017 - Present)

ISMRM (2017- Present)

Turkish MR Foundation (2013-2015)

SKILLS

Quantitative Magnetic Resonance Imaging

Medical Image Processing

Musculoskeletal Mechanics

MATLAB, C, C++ (QT), Python, Ruby on Rails, DevOps, Docker, Kubernetes, Helm, Terraform, OpenStack, OpenNebula, Redis, Flask, Celery, Nginx, Elasticsearch, Dash, Dokku, Nextflow DSL.

RECOGNITIONS AND SCHOLARSHIPS (22)

Summa Cum Laude for NeuroLibre by ISMRM	**2024**	**Distinction (non-monetary)**
Necmi Tanyolac - The Best PhD Thesis Award, Bogazici Uni.	**2023**	**Winner (5000 TRY)**
Union Neurosciences et Intelligence Artificielle - UNIQUE	**2023**	**Best Poster Award (500 CAD)**
Junior Fellow of the ISMRM	**2023**	**Honorary Fellowship for 10 years**
ISMRM qMRI SG Award for the best Open-source Toolbox	**2023**	**Gold Medal (300 CAD)**
ISMRM Shark Tank Competition	**2023**	**Runner-up (200 CAD)**
Plotly Dash Example Apps Competition	**2023**	**Mention Award (non-monetary)**
The Best PhD Thesis of the Year - Polytechnique Montreal	**2022**	**Special Mention (1000 CAD)**
Neuro-Irv and Helga Cooper Foundation Open-Science Prize	**2022**	**Canadian Trainee (5000 CAD)**
QBIN Open Science Award	**2022**	**Winner (2000 CAD)**
ISMRM White Matter SG Award	**2022**	**Gold medal (320 CAD)**
Summa Cum Laude for VENUS by ISMRM	**2022**	**Distinction (non-monetary)**
ISMRM Reproducible Research SG Award	**2022**	**Gold medal (200 CAD)**
TransMedTech Postdoctoral Fellowship	**2021**	**2 years (63,000 CAD)**
ISMRM Innovation in MRI Education	**2021**	**2nd Place (non-monetary)**
ISMRM Reproducible Research SG Award	**2021**	**Silver medal (150 CAD)**
ISMRM Research Exchange Grant	**2020**	**Stanford University (8000 USD)**
Canadian Open Neuroscience Platform Scholarship	**2019**	**2 years (25,000 CAD)**
ISMRM qMRI-SG trainee research award	**2018**	**Silver medal (350 CAD)**
TransMedTech Excellence Scholarship	**2018**	**3 years (40,000 CAD)**
ISMRM Magnetic Moments Competition	**2017**	**People's choice (non-monetary)**
Prof. Dr. Zeki Korkusuz Biomechanics Award	**2016**	**1st place (500 TRY)**

INTERNSHIPS

Vista AI Inc. CA, USA
Ministry of Health Turkey
Siemens Healthcare Bosnia-Hercegovina
Medicana International Hospital Turkey

Field Experience (Monthlong for each)
Training on RTHawk SDK
Clinical asset management
Diagnostic imaging system installation and service
Biomedical service management

** I completed the graduation requirements for this degree between 2015 and 2017 before starting my PhD in Canada. I submitted my thesis to Bogazici Uni. in late 2022 upon the publication of my second peer-reviewed article on the subject, and successfully defended it in early 2023.*

REFERENCES

Nikola Stikov (Ph.D. Advisor)
Biomedical Engineering Institute
Ecole Polytechnique de Montreal
nikola.stikov@polymtl.ca

John M. Pauly, Ph.D.
Electrical Engineering
Stanford University
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ONLINE PROFILES

Google Scholar

Linkedin

GitHub

OSF

RELEVANT PAGES

https://agahkarakuzu.github.io

https://qmrlab.org/VENUS

https://neurolibre.org

This is a shortened version of my CV
The complete list of conference abstracts, academic talks, event participations and further details are available in my Canadian Common CV (CCV).

DOWNLOAD CCV