Agah Karakuzu

Postdoctoral Fellow

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RESARCH EXPERIENCE

NeuroPoly (CA)

Institute of Biomedical Engineering
Polytechnique Montreal - *Postdoctoral Fellow*
September 2022 - **Present**
Advisor: Prof. Nikola Stikov

Research Experience
Ph.D. thesis: Bringing qMRI under one umbrella
Obtained Ph.D. degree (2022/04)
Vendor-neutral sequences (VENUS)
A global data standard for qMRI (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

Research Experience
Obtained M.Sc. degree (2015/06)
Musculoskeletal MRI methods development
Implemented medical image analysis methods
Prepared journal and conference articles
Conducted intraoperative experiments

VAVLAB (TR)

Electrics and Electronics Engineering Dep.
Boğaziçi University - *Project Assistant*
March 2014 - 2017
Advisor: Assoc. Prof. Burak Acar

Research Experience
Managed colloboration with Biomechanics Lab
Performed volumetric analysis and visualisation on musculoskeletal MRI data using DT tractography and image registration methods.

Software Development

- A global data standard for quantitative MRI (qMRI-BIDS)
- Vendor-neutral pulse sequences (RTHawk) and data-driven workflows for quantitative MRI (Nextflow)
- NeuroLibre: A preprint server for interactive data analyses (Ruby on Rails, Python, Kubernetes)
- Object oriented design and development in MATLAB to develop an open source software for quantitative MRI (qMRLab). Used GitHub for versioning, Docker for containerization, Travis for CI, Sphinx for automated documentation. Created polyglot Jupyter Notebooks that can run multiple kernels to use Python-powered interactive visualization tools along with qMRLab modules in Octave syntax. Made these notebooks executable online using BinderHub to create interactive tutorials.

EDUCATION

Polytechnique Montreal (CA)

Ph.D. in Biomedical Engineering
January 2017 - April 2022
CGPA of **3.85** | 4.00

Boğaziçi University (TR)

M.Sc. in Biomedical Engineering
September 2013 - June 2015
CGPA of **4.00** | 4.00

Erciyes University (TR)

B.Sc. in Biomedical Engineering
September 2009 - July 2013
CGPA of **3.28** | 4.00
Erasmus Internship Funding
Certificate of Honour

LANGUAGES

Turkish (Fluent)
English (Fluent)
French (Beginner)

SCIENCE COMMUNICATION

ISMRM's MR Pulse Blog
Developer
MRM Highlights
Contributor
OHBM Blog
Contributor

INTERESTS

Open Science
Graphic designing
Skiing

MEMBERSHIP

OHBM (2017 - Present)
ISMRM (2017- Present)
Turkish MR Foundation (2013-2015)

SKILLS

Quantitative Magnetic Resonance Imaging
Medical Image Processing
Musculoskeletal Mechanics
Software development: MATLAB, C, C++, ITK, VTK, QT, Python, JavaScript, Nextflow, DevOps, Docker, OpenStack, Helm, Terraform

RECOGNITIONS AND SCHOLARSHIPS

QBIN Open Science Award	2022	1/3 winners (2000 CAD)
ISMRM White Matter SG Award	2022	Gold medal (320 CAD)
Summa Cum Laude for VENUS by ISMRM	2022	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)

JOURNAL ARTICLES

Vendor-neutral sequences (VENUS) improve multicenter reproducibility of quantitative MRI
Karakuzu A., Biswas L., Cohen-Adad J., Stikov, N,
Magnetic Resonance in Medicine, 88:3, 1212-1228, (2022)

qMRI-BIDS: an extension to the brain imaging data structure for quantitative magnetic resonance imaging
Karakuzu A., Appelhoff S., Auer T., et al., and Hollander, G.
Scientific Data, 9:517, (2022)

NeuroLibre: A preprint server for full-fledged reproducible neuroscience
Karakuzu A., DuPre E., Tetrel L., et al., and Stikov N.
OSF Preprints, (2022)

Beyond advertising: New infrastructures for publishing integrated research objects
DuPre E., Holdfraf C., Karakuzu A., et al., and Poline J.B.
PLOS Computational Biology, 18 (1), e1009651, (2022)

qMRLab: Quantitative MRI anaylsis, under one umbrella
Karakuzu A., Boudreau M., Duval T., et al., and Stikov N.
Journal of Open Source Software, (2020)

An interactive analysis of MRI biomarkers of myelin
Mancini M., Karakuzu A., Cohen-Adad J., Cercignani M., Nichols T., and Stikov N.
e-Life, 9:e61523, (2020)

CG-SENSE revisited: Results from the first ISMRM reproducibility challenge
Maier O., Baete S., Frydahl A., Hammerick K., Kasper L., Karakuzu A., et al., and Knoll F.
Magnetic Resonance in Medicine, 85:4, 1821-1839 (2020)

Arterial stiffness and white matter integrity in the elderly: a diffusion tensor and magnetization transfer imaging study
Badji A., de la Colina A., Karakuzu A., et al., and Cohen-Adad J.
NueroImage, 186, 577-585, (2019)

Let's talk about cardiac T1 mapping
Karakuzu A., Hafyane T., Duquette C., Mongeon F.P., et al., and Stikov N.
bioRxiv, (2018)

Magnetic resonance and diffusion tensor imaging analyses indicate heterogeneous strains along human medial gastrocnemius fascicles caused by submaximal plantar-flexion activity
Karakuzu A., Pamuk U., Ozturk C., Acar B., and Yucesoy C.A.
Journal of Biomechanics, 57, 69-78, (2017)

JOURNAL ARTICLES CONT.

Open and reproducible neuroimaging: From study inception to publication
Niso G., et al., Karakuzu A., et al., and Rieger-J.W.
Neuroimage, 119623, (2022)

Brainhack: Developing a culture of open, inclusive, community-driven neuroscience
Gau R., et al., Karakuzu A., et al., and Marinazzo D.
Neuron, 109:11, (2021)

Centering inclusivity in the design of online conferences - An OHBM Open Science perspective
Levitis L., et al., Karakuzu A., et al., and Maumet C.
GigaScience, 10:8, giab051 (2021)

Arterial stiffness cut-off value and white matter integrity in the elderly
Badji A., de la Colina A., Karakuzu A., et al., and Cohen-Adad J.
Neuroimage: Clinical, 26 , 201007, (2020)

A cross-sectional study on the impact of arterial stiffness on the corpus callosum, a key white matter tract implicated in Alzheimer's disease
Badji A., de la Colina A., Karakuzu A., et al., and Girouard H.
Journal of Alzheimer's Disease, 77:2, (2020)

Combined magnetic resonance and diffusion tensor imaging analyses provide a powerful tool for in vivo assessment of deformation along human muscle fibers
Pamuk U., Karakuzu A., Ozturk C., Acar B., and Yucesoy C.A.
Journal of the Mechanical Behaviour of Biomedical Materials, 63, (2016)

Combined magnetic resonance and diffusion tensor imaging analyses provide a powerful tool for in vivo assessment of deformation along human muscle fibers
Pamuk U., Karakuzu A., Ozturk C., Acar B., and Yucesoy C.A.
Journal of the Mechanical Behaviour of Biomedical Materials, 63, (2016)

Analysis of microcantilevers excited by pulsed-laser-induced photoacoustic waves
Demirkiran A., Karakuzu A., Erkol H., Torun H., and Unlu M.B.
Journal of the Mechanical Behaviour of Biomedical Materials, 63, (2016)

CONFERENCE ARTICLES AND PRESENTATIONS

Karakuzu A., Cohen-Adad J., and Stikov, N., Multicenter reproducibility of quantitative MRI using vendor-neutral sequences. 31st Annual Meeting of the ISMRM, London, UK, **2022**

Karakuzu A., Cohen-Adad J., and Stikov, N., Developing MRI with community in mind: Vendor-neutral sequences improve multicenter reproducibility., OHBM Annual Meeting, Glasgow, UK, **2022**

Karakuzu A., Scientific computing with Python: From acoustic dissonance to magnetic resonance., Annual Meeting of the ISMRM, Virtual Event, **2021**

Karakuzu A., Boudreau M,, Cohen-Adad J., and Stikov, N., Thinking outside the blackbox: A fully transparent T1 mapping workflow under version control, ISMRM and SMRT Virtual Conference & Exhibition, **2020**

Karakuzu A., Boudreau M, Duval T., Leppert I., Boshkovski T., Cohen-Adad J. and Stikov, N., The qMRLab workflow: From acquisition to publication, ISMRM 27th Annual Meeting and Exhibition, Montreal, Canada, **2019**

Karakuzu A., Boudreau M, Duval T., Leppert I., Boshkovski T., Cohen-Adad J. and Stikov, N., qMRLab: Quantitative MRI, under one umbrella ISMRM 26th Annual Meeting and Exhibition, Paris, France, **2018**

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

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INTERNSHIPS

Heartvista 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

REFERENCES

Nikola Stikov (Ph.D. Advisor)
Biomedical Engineering Institute
Ecole Polytechnique de Montreal
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Pierre Bellec
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ONLINE PROFILES

Google Scholar

Linkedin

GitHub

OSF

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RELATED WEB PAGES

https://agahkarakuzu.github.io

https://qmrlab.org/VENUS

https://neurolibre.org

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