Agah Karakuzu, Ph.D.

Biomedical Engineer

PHONE [redacted]

EMAIL [redacted]

STATUS Permanent Resident of Canada

RESEARCH EXPERIENCE

Rokers Vision Lab

Psychology Department | NYU Abu Dhabi

- 2024/01 – 2024/02 - Visiting Researcher

Juntendo University

Radiology Department | Juntendo U. Hospital

- 2024/02 – 2024/03 - Visiting Researcher

MRSRL Stanford

Electrical Engineering | Stanford University

- 2023/03 – 2023/05 - Visiting Researcher

NeuroPoly Lab

Biomedical Engineering | Polytechnique Montreal

- 2022/03 – Present - Postdoctoral Fellow
- 2017/01 – 2022/03 - Ph.D. Scholar

Advisor: Prof. Nikola Stikov

PhD Thesis

Bringing Quantitative Magnetic Resonance Imaging Under One Umbrella

- An interactive ***data dashboard***
- Assistance for NeuroLibre publications
- ***NeuroLibre*** Federation server deployment

- Vendor-neutral MP2RAGE pulse sequence in ***Pulseq***
- Validation experiments on ***Siemens, GE, and Canon scanners***
- NeuroLibre Federation server deployment

- A vendor-neutral ***calibration*** pulse sequence
- MR Fingerprinting ***image reconstruction***
- Reproducible ***workflow*** development

- 7 first-author, 12 co-authored publications
- A standardization framework for ***quantitative MRI*** (qMRI)
- Vendor-neutral ***pulse sequences*** and workflows (VENUS)
- A global ***data standard*** for qMRI (BIDS)
- ***Open-source*** qMRI software (qMRLab)
- ***Reproducible*** preprint platform (NeuroLibre)

Biomechanics Lab

Institute of Biomedical Engineering

Bogazici University - Research Assistant

- 2013/08 - 2017/01 Advisor: Prof. Can A. Yucesoy

PhD Thesis

Human Muscle Structure-Function Relation In-vivo Using MRI Modalities

MSc Thesis

In-vivo Assessment of Local Deformations Along Human Medial Gastrocnemius Muscle Fibers on Submaximal Plantarflexion Activity

- 2 first-author, 4 co-authored publications
- A novel MRI method for ***in-vivo quantification*** of muscle fiber-direction strain
- Diffusion tensor ***tractography of skeletal muscles***
- A theory on ***musculoskeletal force transmission***
- ***Intra-operative*** experiments on spastic cerebral palsy

BUSIM VAVLAB

Signal and Image Processing Laboratory

Bogazici University - Research Assistant

- 2014/03 - 2017/01 Advisor: Prof. Burak Acar

- Collaboration with Biomechanics Lab.
- Volumetric analysis and visualization of musculoskeletal MRI data using ***diffusion tensor imaging*** (DTI) and Demons ***image registration*** methods.

EDUCATION

Polytechnique Montreal

Ph.D. in Biomedical Engineering
2017/01 - 2022/03

Bogazici University

Ph.D. in Biomedical Engineering
2015/06 - 2022/10

M.Sc. in Biomedical Engineering
2013/09 - 2015/06

Erciyes University

B.Sc. in Biomedical Engineering
2009/09 - 2013/06
CGPA of **3.28** | 4.00
Summa Cum Laude

LANGUAGES

Turkish	Fluent
English	Fluent
French	Beginner

SCIENCE COMMUNICATION

MR Pulse	Developer
MRMH	Contributor
OHBM Blog	Contributor

LEADERSHIP

NeuroLibre Day	Founder
MRathon	Founder
BrainHack	Organizer
MRI Together	Tutor
Open MRB	Tutor

MEMBERSHIPS

OHBM	2017 -
ISMRM	2017 -
F1000	2018 - 2019
ISB	2013 - 2017
TMRD	2013 - 2015

SKILLS

MRI Physics | Medical Imaging | qMRI Metrology | Reproducible Science | Workflows | Biomechanics | Open-source Software | Data Standards

CODING

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

TEACHING

Award Winner | Formal Education | Online Resources

Invited Lecture		2024	McGill University	The Neuro Open Science Office Hours, Montreal, Canada
			A hands-on workshop for preparing MyST formatted reproducible documents	
Invited Lecture		2023	MRI Together	Workshop, Online
			Revive your code and data with NeuroLibre reproducible preprints	
Invited Lecture		2022	OHBM	Educational Sessions, Scotland, UK
			Towards comparable MRI - The role of open-source and community data standards	
Invited Lecture		2022	University of Malta	Boundaries of the Brain Workshop, Malta
			Basics of quantitative MRI for quantifying brain microstructure	
Repetiteur		2021	Polytechnique Montreal	GBM6330 - Emerging biomedical technologies
			Developed web platform for managing student projects and curated online content.	
Invited Lecture		2021	ISMRM	Sunrise Educational Lecture, Online
			Scientific computing with Python - Hands-on signal processing lecture for MRI scientists.	
Instructor		2020	BrainHack School	Data Science Workshop, Online
			Interactive plots and the spectrum of data visualization for machine learning.	
Invited Lecture		2020	OHBM	BrainHack Global, Online
			Divide and conquer m-scripts - DevOps for reproducible open-source MATLAB software.	
Invited Lecture		2020	Open MR Benelux	HackTrack Workshop, Nijmegen, Netherlands
			Docker for MRI scientists - Lecture followed by hands-on tutorials.	
Repetiteur		2019	Polytechnique Montreal	GBM8378 - Principes d'imagerie biomédicale
			Helped developed course material, and implemented nbgrader for grading assignments.	
Challenge		2019	ISMRM	Africa MRI Training Challenge, Montreal, Canada
			Developed online teaching material for qMRI using Jupyter and BinderHub.	
Competition		2018	ISMRM	Magnetic Moments Competition
			Created a video to explain the motivation of my PhD research to general public.	
Assistant		2016	Bogazici University	BM525 - Tissue Biomechanics
			Held office hours, supervised students for their term projects, graded exams.	
Assistant		2014	Bogazici University	BM563 - Medical Imaging
			Gave one lecture on MRI basics and held office hours.	

AWARDS & DISTINCTIONS

Research | Leadership | Education | Scholarship | Academic | Other

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)
MRI Education in Africa Challenge	2019	1st Place (non-monetary)
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 PUBLICATIONS

● Co-author ● First author

[Repeat it without me: Crowdsourcing the T1 mapping common ground via the ISMRM reproducibility challenge.](#)
Karakuzu, A.*, Boudreau, M*., Cohen-Adad, J., Bozkurt, E., Carr, M., et. al., and Stikov N.
Magnetic Resonance in Medicine, 92(3), 1115–1127, (2024).

[The past, present, and future of the brain imaging data structure (BIDS).](#)
Poldrack, R. A., Markiewicz, C. J., Appelhoff, S., Ashar, Y. K., Auer, T., et. al., **Karakuzu A.**, et. al., and, Gorgolewski, K. J.
Imaging Neuroscience, 2, 1–19, (2024).

2024

[Reproducible Research Practices in Magnetic Resonance Neuroimaging: A Review Informed by Advanced Language Models.](#)
Karakuzu, A., Boudreau, M., and, Stikov, N.
Magnetic Resonance in Medical Sciences, 23(3), 252–267, (2024).

[The relaxometry hype cycle.](#)
Stikov, N., & Karakuzu, A.
Frontiers in Physiology, 14. (2023).

[The Canadian Open Neuroscience Platform—An open science framework for the neuroscience community.](#)
Harding, R. J., Bermudez, P., Bernier, A., Beauvais, M., Bellec, P., Hill, S., **Karakuzu, A.**, et. al., and, Evans, A. C. .
PLOS Computational Biology, 19(7), e1011230, (2023).

2023

[In-vivo along muscle fascicle strain heterogeneity is not affected by image registration parameters: Robustness testing of combined magnetic resonance-diffusion tensor imaging method.](#)
Karakuzu, A., Arpak, A., and, Yucesoy, C. A.
Journal of the Mechanical Behavior of Biomedical Materials, 139, 105681. (2023).

[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) | *In preparation for Nature*

[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)

2022

[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)

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)

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

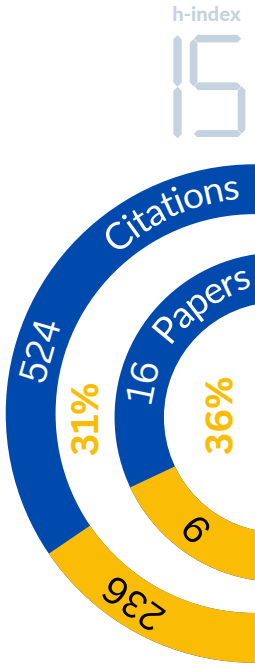
[An interactive analysis of MRI biomarkers of myelin](#)
Mancini M., **Karakuzu A.,** Cohen-Adad J., Cercignani M., Nichols T., and Stikov N.
e-Life, 9:e61523, (2020)

[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 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)

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)



JOURNAL PUBLICATIONS

● Co-author ● First author

2019 **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)

The role of intra- and epimuscular fasciae beyond being passive structural elements: MRI analyses indicate that they interfere with and affect muscle's active mechanics.
Gozubuyuk, O. B., **Karakuzu, A.**, Pamuk, U., and Yucesoy, C. A.
Journal of Bodywork and Movement Therapies, 22(4), 852–853, (2018)

Analysis of microcantilevers excited by pulsed-laser-induced photoacoustic waves.
Demirkiran, A., **Karakuzu, A.**, Erkol, H., Torun, H., & Unlu, M. B.
Optics Express, 26(4), 4906. (2018)

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

2018 **Successful return to play following adductor longus proximal tendon rupture in professional soccer without re-injury at 12 months: A case report.**
Gözübüyük, O. B., Moen, M. H., Akman, M., Ipseftel, I., and **Karakuzu, A.**
Journal of Back and Musculoskeletal Rehabilitation, 31(3), 583–587, (2018)

2017 **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)

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)

CONFERENCE ABSTRACTS (ABRIDGED)

- Uwase E., Caru M., Mahalatchimy F., **Karakuzu A.**, Stikov, N., Curnier D., Perie D., Novel inotropic Exercise CMR Protocol for Cardiac Mechanics Characterization, ISMRM Annual Meeting (Submitted)
- **Karakuzu A.**, Hagiwara, A., Uchida W., Fujita S., Tasdelen B., Nielsen, J.F., Aoki S., Stikov N., MP2RAGE against the machine: Scanning in the name of reproducibility with Pulseq in VENUS, ESMRMB Annual Meeting, Barcelona, Spain, **2024**
- **Karakuzu A**., DuPre E., Bermudez P., Boudreau M., Harding R., Poline, J.B., Das S., Bellec P., Stikov N., NeuroLibre: Living MRI preprints with built-in support for code review, ISMRM Annual Meeting, Singapore, **2024**
- **Karakuzu A.**, Samson P., Stikov N., Vendor-neutrality and upgrade immunity: Post-upgrade assessment of vendor-neutral qMRI from two perspectives,White Matter, Analysis, Translation, Experimental Validation, Evaluation & Reproducibility, Nashville, TN, USA, **2023**
- Blostein, N., Samson, P., Cohen-Adad J., Stikov, N., **Karakuzu. A.**, Vendor-neutral automated acquisition workflow for spinal cord MRI. OHBM Annual Meeting, Montreal, QC, Canada, **2023**
- **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.,** 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.R., Boshkovski T., Cohen-Adad J., Stikov, N,, The qMRLab workflow: From acquisition to publication, International Society of Magnetic Resonane in Medicine Annual Meeting, Montreal, Canada, **2019**
- **Karakuzu A.,** Duval T., Leppert I.R., Cabana J.F., Boudreau M., Gagnon I., Bestereyov G., Cohen-Adad J., Stikov N., Quantitative MRI made easy by qMRLab, XXI Journee de la recherce, Institut de Cardiologie de Montreal, Montreal, Canada, **2018.**
- **Karakuzu A.,** Pernet C.R., Duval T., Cohen-Adad J., Stikov N., A statistical framework for evaluating the reliability of myelin imaging, International Society of Magnetic Resonance in Medicine Annual Meeting, Paris, France, **2018**.
- Yucesoy C.A., **Karakuzu A.**, Pamuk U., Intra- and epimuscular connective tissues are not just passive structural elements, but interfere with, and affect muscle's active mechanics, 8th World congress of Biomechanics, Dublin, Ireland, **2018.**

CONFERENCE ABSTRACTS (ABRIDGED)

- Demirkiran A., **Karakuzu A.,** Erkol H., Torun H., Unlu B., A custom-designed atomic force microscopy head system for photoacoustic imaging, The International Society for optics and photonics annual meeting, **2018.**
- Pamuk U., **Karakuzu A.,** Yucesoy C.A., Effectis of variation of stretch and activation level on human gastrocnemius geometric and mechanical metrics, XXVI conference of International Society of Biomechanics, Brisbane, Australia, **2017.**
- Pamuk U., **Karakuzu A.**, Sanli G., Yucesoy C.A., Muscle's activation state affects medial gastrocnemius fiber strain heterogeneity: Assessment using MRI and DTI methods, XXVI conference of International Society of Biomechanics, Brisbane, Australia, **2017**.
- **Karakuzu A.,** Pamuk U., Ozturk C., Acar B., Yucesoy C.A. Using diffusion tensor imaging for in-vivo assessment of human muscle function, 21st conference of European Collage of Sports Science, **2016.**
- **Karakuzu A.**, Pamuk U., Acar B., Yucesoy C.A., Using advanced MRI techniques for estimating strain distributions along muscle fibers during isometric plantarflexion activity of human m. Gastrocnemius in- vivo., XXV Congress of International Society of Biomechanics (ISB), Glasgow, UK, **2015.**
- Pamuk U., **Karakuzu A.**, Akyazı P., Acar B., Öztürk C., Yücesoy C.A., Magnetic resonance imaging analysis confirm so far theoratically posed intermuscular interaction effects in-vivo., International Society of Electrophysiology and Kinesiology (ISEK) Annual Meeting, Rome, Italy, **2014.**
- **Karakuzu A.** , Pamuk U., Yücesoy C. A., Öztürk C., In-vivo assessment of skeletal muscle mechanics during joint motion by using multimodal magnetic resonance imaging., International Society of Magnetic Resonance Imaging In Medicine (ISMRM) Outreach Meeting, Ankara, Turkey **2014.**
- **Karakuzu A.**, Pamuk U., Öztürk C., Yücesoy C. A., In-vivo assessment of skeletal muscle mechanics during joint motion : Multimodal magnetic resonance imaging based approach., Annual National Meeting of Biomedical Engineers (BIYOMUT), Istanbul, Turkey, **2014.**
- **Karakuzu A.**, Güven A.,Gümüs K. Z., A quantitative approach to volume and area measurement of multipl sclerosis lesions using semi-automatic segmentation., 18th Annual Meeting of Turkish Magnetic Resonance Foundation, Ankara, Turkey, **2013.**

INVITED TALKS (ABRIDGED)

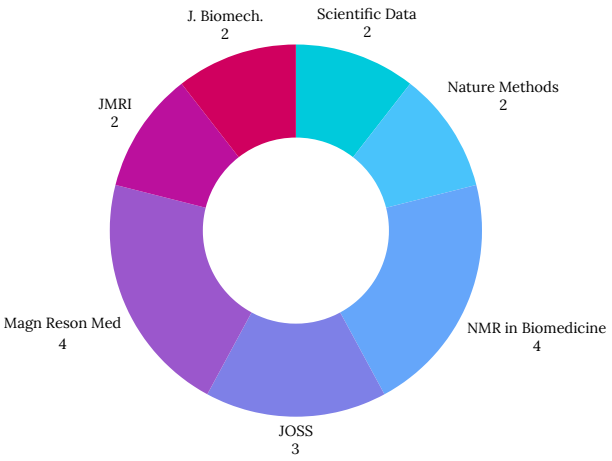
- **Karakuzu A.,** (2024) Next-generation publishing with NeuroLibre, The Neuro Open Science Office Hours, Montreal, QC, Canada
- **Karakuzu A.,** (2024), Engineering strategies for gearing quantitative MRI towards clinical use, Juntento University Radiology Department, Tokyo, Japan
- **Karakuzu A.,** (2024), Informing brain-wide connectomics with microstructural information using MRI, Neuroimaging Lab, NYU Abu Dhabi, UAE
- **Karakuzu A.,** (2023) MRI Workflows for Measurement: Blackbox, Graybox, & Glassbox Benchmarks on Reproducibility. ISMRM Workshop on Data Sampling & Image Reconstruction, Sedona, United States of America
- **Karakuzu A.,** (2023) Open-science as the foundation of an academic career: An ECR perspective, Tannenbaum Leadership Meeting, Montreal, QC, Canada
- **Karakuzu A.,** (2023) Clearing the way for end-to-end standardization of quantitative MRI, ISMRM qMRI Study Group Meeting, Online Event
- **Karakuzu A.,** (2023) Open source initiatives for quantitative imaging: Proprietary vs open-source, ISMRM Elastography SG Meeting, Online Event
- **Karakuzu A.,** (2023) Developing a calibration sequence for MRI finger-printing using RTHawk, MRSRL, Stanford University, Palo Alto, CA, USA
- **Karakuzu A.,** (2023) Sharing integrated research, not just the manuscript, ISMRM Open MIS at the ISMRM Annual Meeting, Toronto, ON, Canada
- **Karakuzu A.**, (2022) Open-source MRI research from scanner to publication, The Neuro, McGill University, Montreal, QC, Canada
- **Karakuzu A.,** (2022) Pushing the boundaries of reproducibility for the BOB : End-to-end standardization of user-friendly workflows,Univ. Of Malta, Msida, Malta
- **Karakuzu A.** (2021) Improving inter-vendor reproducibility of quantitative MRI, MRI Together, Online Event.
- **Karakuzu A.** (2021) In search of common ground for myelin imaging, ISMRM Turkish Chapter 3rd Virtual Workshop
- **Karakuzu A.** (2021) Interactive plots and the spectrum of data visualization. Quebec Bio-imaging Network SciComm Seminar Series, Montreal, Canada
- **Karakuzu A.** (2020) qMRI-BIDS: A BIDS extension for quantitative MRI. OHBM 2020 Annual Meeting
- **Karakuzu A.,** et. al. (2019) NeuroLibre: A sprout of living publications. Neuro-Gairdner Open Science in Action Symposium, Montreal, Canada

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

JOURNAL REVIEW ACTIVITIES



COMMITTEE MEMBERSHIPS

ISMRM Annual Meeting Programming Committee Member
ISMRM Education Committee Member
TOSI Open Science Grants Selection Committee Member
Neuro Open Science Awards Committee Member
QBIN Open Science Awards Committee Member
CONP Publication Committee Member

EDITORIAL ACTIVITIES

Section Editor
Handbook of Magnetic Resonance Imaging by Springer
Chapter on quantitative MRI

REFERENCES

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ntreal
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John M. Pauly, Ph.D.
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Department of Radiology
[redacted]

Juan Santos, Ph.D.
CTO
[redacted]

Alan C. Evans, Ph.D.
Montreal Neurological Institute
[redacted]