FRANCESCO GRUSSU

CONTACT AND ONLINE PROFILES

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Scopus	56512026600
Web of Science	AAE-8109-2019
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EDUCATION AND TRAINING

Sept.-Nov. 2017 — New York University (NYU), USA

Observer Researcher

Affiliation: Dept. of Radiology, NYU Langone Medical Center.
Training: advanced denoising techniques for diffusion MRI.

2012-2016 — University College London (UCL), UK

PhD in MR Physics

Information: viva passed with no corrections on 15th/03/2016; thesis entitled "*Microstructural imaging of the human spinal cord with advanced diffusion MRI*"

2010-2012 — University of Genoa, Italy

Master's Degree in Bioengineering

Mark: 110 out of 110 *cum laude* & *Dignità di Stampa* (Examination Panel award).
Dissertation: "*A study on a bidirectional brain-machine interface inspired by the corticospinal control of movement*".

2006-2009 — University of Cagliari, Italy

Bachelor's Degree in Biomedical Engineering

Mark: 110 out of 110 *cum laude*.
Dissertation: "*Real time wavelet denoising on a DSP of neural signals coming from the peripheral nervous system*".

WORK EXPERIENCE

Oct.2020-now — Senior Fellow, VHIO — Barcelona, Spain

Vall d'Hebron Institute of Oncology

Affiliations: Radiomics Group, Clinical Research Department.
Responsibilities: development of microstructural MRI techniques in cancer.

Sep.2020-Sep.22 — Honorary Senior Fellow, UCL — London, UK

University College London

Affiliations: Queen Square Institute of Neurology.
Responsibilities: collaborator in MRI development in multiple sclerosis.

Feb.2016-Sept.20 — Research Associate, UCL — London, UK

University College London

Affiliations: Institute of Neurology; Centre for Medical Image Computing.
Responsibilities: quantitative MRI development (spinal cord, brain, prostate).

Oct. '14; Jan. '17 Scientific Advisor, Flickteck — London, UK

Flickteck Ltd

Responsibilities: design of wearable human-machine interfaces.

May-June 2012 Research Assistant, QMUL — London, UK

Queen Mary Univ. of London

Affiliation: School of Electronic Engineering and Computer Science (EECS).
Responsibilities: image segmentation (Computed Tomography Angiography).

IMPACT STATS

h-index

Google Scholar h-index on 15/06/2022: 15

Citations

Total Google Scholar citations on 15/06/2022: 912

SCIENTIFIC ARTICLES — FIRST AUTHORSHIP

Magn Reson Med 2022

"*Diffusion MRI signal cumulants and hepatocyte microstructure at fixed diffusion time: Insights from simulations, 9.4T imaging, and histology*". Grussu F et al. Magnetic Resonance in Medicine (2022), 88(1): 365-379, doi: 10.1002/mrm.29174.

Front Phys 2021

"*Feasibility of data-driven, model-free quantitative MRI protocol design: application to brain and prostate diffusion-relaxation imaging*". Grussu F et al. Frontiers in Physics (2021), 9: 752208, doi: 10.3389/fphy.2021.752208.

Sem Ultrasound CT MRI 2021

"*Diffusion-weighted imaging: recent advances and applications*". Martinez-Heras E*, Grussu F*, et al. Seminars in Ultrasound, CT and MRI (2021), 42(5): 490-506, doi: 10.1053/j.sult.2021.07.006. *: equal contribution (co-first authors).

NeuroImage 2020

"*Multi-parametric quantitative in vivo spinal cord MRI with unified signal readout and image denoising*". Grussu F et al. NeuroImage (2020), 217: 116884, doi: 10.1016/j.neuroimage.2020.116884.

Magn Reson Med 2019

"*Relevance of time-dependence for clinically viable diffusion imaging of the spinal cord*". Grussu F et al. Magnetic Resonance in Medicine (2019), 81(2): 1247-1264, doi: 10.1002/mrm.27463.

Ann Clin Transl Neurol 2017

"*Neurite dispersion: a new marker of multiple sclerosis spinal cord pathology?*". Grussu F*, Schneider T* et al. Annals of Clinical and Translational Neurology (2017), 4(9):663-679, doi: 10.1002/acn3.445. *: equal contribution (co-first authors). Paper featured in Nature Reviews Neurology "Research Highlights" (Patel M, Nat Rev Neur (2017), 13(10): 578, doi: 10.1038/nrneurol.2017.127).

J Neurosci Meth 2016

"*A framework for optimal whole-sample histological quantification of neurite orientation dispersion in the human spinal cord*". Grussu F et al. Journal of Neuroscience Methods (2016), 273:20-32, doi: 10.1016/j.jneumeth.2016.08.002.

NeuroImage 2015

"*Neurite orientation dispersion and density imaging of the healthy cervical spinal cord* in vivo". Grussu F et al. NeuroImage (2015), 111:590-601, doi: 10.1016/j.neuroimage.2015.01.045.

SCIENTIFIC ARTICLES — SENIOR AUTHORSHIP

Front Neurol 2021

"*Comparison of neurite orientation dispersion and density imaging and two-compartment spherical mean technique parameter maps in multiple sclerosis*". Johnson D*, Ricciardi A*, ..., and Grussu F. Frontiers in Neurology (2021), 12: 662855, doi: 10.3389/fneur.2021.662855. *: equal contribution (co-first authors).

SCIENTIFIC ARTICLES — CO-AUTHORSHIP

Magn Reson Med 2022

"*Multi-echo quantitative susceptibility mapping: how to combine echoes for accuracy*

and precision at 3 T". Biondetti E, ..., Grussu F et al. Magnetic Resonance in Medicine (2022), accepted (in production), doi: 10.1002/mrm.29365.

Magn Reson Med 2022

"*SENSE EPI reconstruction with 2D phase error correction and channel-wise noise removal*". Powell E, ..., Grussu F et al. Magnetic Resonance in Medicine (2022), accepted (in production), doi: 10.1002/mrm.29349.

Magn Reson Med 2022

"*Comparison of multicenter MRI protocols for visualizing the spinal cord gray matter*". Cohen-Adad J, ..., Grussu F et al. Magnetic Resonance in Medicine (2022), on-line publication ahead of print, doi: 10.1002/mrm.29249.

Eur Radiol 2022

"*Voxel-level analysis of normalized DSC-PWI time-intensity curves: a potential generalizable approach and its proof of concept in discriminating glioblastoma and metastasis*". Pons-Escoda A, ..., Grussu F et al. European Radiology (2022), 32: 3705–3715, doi: 10.1007/s00330-021-08498-1.

BMJ Open 2022

"*Histo-MRI map study protocol: a prospective cohort study mapping MRI to histology for biomarker validation and prediction of prostate cancer*". Singh S, ..., Grussu F et al. BMJ Open (2022), 12: e059847, doi: 10.1136/bmjopen-2021-059847.

NeuroImage Clin 2022

"*Spatial patterns of brain lesions assessed through covariance estimations of lesional voxels in multiple sclerosis: the SPACE-MS technique*". Tur C, Grussu F et al. NeuroImage: Clinical (2022), 33: 102904, doi: 10.1016/j.nicl.2021.102904.

Front Neurol 2021

"*Assessing lumbar plexus and sciatic nerve damage in relapsing-remitting multiple sclerosis using magnetisation transfer ratio*". Boonsuth R, ..., Grussu F et al. Frontiers in Neurology (2021), 12: 763143, doi: 10.3389/fneur.2021.763143.

Sci Rep 2021

"*Robust imaging habitat computation using voxel-wise radiomics features*". Bernatowicz K, Grussu F et al. Scientific Reports (2021), 11: 20133, doi: 10.1038/s41598-021-99701-2.

Sci Data 2021

"*Open-access quantitative MRI data of the spinal cord and reproducibility across participants, sites and manufacturers*". Cohen-Adad J, ..., Grussu F et al. Scientific Data (2021), 8: 219, doi: 10.1038/s41597-021-00941-8.

Nat Protoc 2021

"*Generic acquisition protocol for quantitative MRI of the spinal cord*". Cohen-Adad J, ..., Grussu F et al. Nature Protocols (2021), 16: 4611–4632, doi: 10.1038/s41596-021-00588-0.

Brain 2021

"*Brain microstructural and metabolic alterations detected in vivo at the onset of the first demyelinating event*". Collorone S, ..., Grussu F et al. Brain (2021), 144: 1409-1421, doi: 10.1093/brain/awab043.

NeuroImage 2021

"*Uncertainty modelling in deep learning for safer neuroimage enhancement: demonstration in diffusion MRI*". Tanno R, ... Grussu F et al. NeuroImage (2021), 225: 117366, doi: 10.1016/j.neuroimage.2020.117366.

Mult Scler 2020

"*Reduced neurite density in the brain and cervical spinal cord in relapsing–remitting multiple sclerosis: A NODDI study*". Collorone S, Cowley N, Grussu F et al. Multiple Sclerosis Journal (2020), 26(13): 1647-1657, doi: 10.1177/1352458519885107.

NeuroImage 2020

"*Cross-scanner and cross-protocol multi-shell diffusion MRI data harmonization: Algorithms and results*". Ning L, Bonet-Carne E, Grussu F et al. NeuroImage (2020), 221: 117128, doi: 10.1016/j.neuroimage.2020.117128.

Mult Scler 2020

"*A multi-shell multi-tissue diffusion study of brain connectivity in early multiple sclerosis*". Tur C, Grussu F et al. Multiple Sclerosis Journal (2019), 26(7): 774-785, doi: 10.1177/1352458519845105.

NeuroImage 2020

"*Generalised boundary shift integral for longitudinal assessment of spinal cord atrophy*". Prados F, ..., Grussu F et al. NeuroImage (2020), 209: 116489, doi: 10.1016/j.neuroimage.2019.116489.

Magn Reson Med 2019 — "*Fast bound pool fraction mapping via steady-state magnetization transfer saturation using single-shot EPI*". Battiston M, ..., Grussu F et al. Magnetic Resonance in Medicine (2019), 82: 1025-1040, doi: 10.1002/mrm.27792.

NeuroImage 2019 — "*Cross-scanner and cross-protocol diffusion MRI data harmonisation: a benchmark database and evaluation of algorithms*". Tax CMW, Grussu F et al. NeuroImage (2019), 195: 285-299, doi: 10.1016/j.neuroimage.2019.01.077.

Sci Rep 2018 — "*Structural cortical network reorganization associated with early conversion to multiple sclerosis*". Tur C, ..., Grussu F et al. Scientific Reports (2018), 8: 10715, doi: 10.1038/s41598-018-29017-1.

Magn Reson Med 2018b — "*An optimized framework for quantitative magnetization transfer imaging of the cervical spinal cord in vivo*". Battiston M, Grussu F et al. Magnetic Resonance in Medicine (2018) 79(5): 2576-2588, doi: 10.1002/mrm.26909.

Magn Reson Med 2018a — "*Fast and reproducible in vivo T1 mapping of the human cervical spinal cord*". Battiston M, ..., Grussu F et al. Magnetic Resonance in Medicine (2018), 79(4): 2142-2148, doi: 10.1002/mrm.26852.

NeuroImage 2017 — "*Spinal cord grey matter segmentation challenge*". Prados F, ..., Grussu F et al. NeuroImage (2017), 152:312–329, doi: 10.1016/j.neuroimage.2017.03.010.

PlosOne 2016 — "*Reduced field-of-view diffusion-weighted imaging of the lumbosacral enlargement: a pilot in vivo study of the healthy spinal cord at 3T*". Yiannakas MC, Grussu F et al. PlosOne (2016), 11(10): e0164890, doi: 10.1371/journal.pone.0164890.

CONFERENCE PAPERS: FIRST AUTHORSHIP

CDMRI 2020 — "*Deep learning model fitting for diffusion-relaxometry: a comparative study*". Grussu F et al. Proc of 2020 MICCAI Workshop on Computational Diffusion MRI, 2021, 159-172, doi: 10.1007/978-3-030-73018-5_13.

CONFERENCE PAPERS: CO-AUTHORSHIP

MICCAI 2022 — "*Progressive subsampling for oversampled data - application to quantitative MRI*". Blumberg SB, ..., Grussu F et al. Proc of Medical Image Computing and Computing Assisted Intervention (MICCAI) 2022, accepted, in production.

CDMRI 2019 — "*Acquiring and predicting multidimensional diffusion (MUDI) data: an open challenge*". Pizzolato M, ..., Grussu F et al. Proc of 2019 MICCAI Workshop on Computational Diffusion MRI, 2020, 195-208, doi: 10.1007/978-3-030-52893-5_17.

CDMRI 2018 — "*Multi-shell diffusion MRI harmonisation and enhancement challenge (MUSHAC): progress and results*". Ning L, ..., Grussu F et al. Proc of 2018 MICCAI Workshop on Computational Diffusion MRI, 2019, 217-224, doi: 10.1007/978-3-030-05831-9_18.

CDMRI 2018 — "*Spatial characterisation of fibre response functions for spherical deconvolution in multiple sclerosis*". Tur C, Grussu F et al. Proc of 2018 MICCAI Workshop on Computational Diffusion MRI, 2019, 265-279, doi: 10.1007/978-3-030-05831-9_21.

MICCAI 2016 — "*Bayesian image quality transfer*". Tanno R, ..., Grussu F et al. Proc of Medical Image Computing and Computing Assisted Intervention (MICCAI) 2016, 265-273, doi: 10.1007/978-3-319-46723-8_31.

BOOK CHAPTERS

CRC Press 2018 — Chapter 8: "*D — the diffusion of water (DTI)*". Grussu F and Wheeler-Kingshott

CAM. "*Quantitative MRI of the brain*" (2nd edition, 2018), Cercignani M, Dowell N and Tofts P editors. ISBN 978-1-138-03285-9, doi: 10.1201/b21837.

BOOK EDITING

CDMRI 2018 — "*Computational Diffusion MRI*". Bonet-Carne E, Grussu F, Ning L, Sepehrband F and Tax C editors. Proc. of 2018 MICCAI Workshop on "*Computational Diffusion MRI*", Granada, Spain, 20/09/2018. ISBN: 978-3-030-05830-2, doi: 10.1007/978-3-030-05831-9.

CDMRI 2017 — "*Computational Diffusion MRI*". Kaden E, Grussu F, Ning L, Tax C and Veraart J editors. Proc. of 2017 MICCAI Workshop on "*Computational Diffusion MRI*", Quebec City, Canada, 10/09/2017. ISBN: 978-3-319-73839-0, doi: 10.1007/978-3-319-73839-0.

RESEARCH FUNDING

La Caixa Fellowship 2022 — 2022 La Caixa Junior Leader Retaining post-doctoral fellowship, La Caixa Foundation, Spain. "*New-generation oncological MRI (New-OncoMRI): development, validation and application*". **Fund**: approx. €305,100 (preliminary). **Role**: principal investigator (fellow). **Duration**: 2022-2025.

AECC Projects 2021 — 2021 AECC - Proyectos Coordinados, Asociación Española Contra el Cancer (Spanish Association Against Cancer), Spain. "*Tumoral senescence induced by anti-cancer therapies constitutes a novel prognostic biomarker and a therapeutic target*". **Fund**: €882,250. **Role**: co-investigator (principal investigator: Manuel Serrano, IRB, Barcelona). **Duration**: 01/09/2022-31/08/2025.

BP Fellowship 2020 — 2020 Beatriu de Pinós post-doctoral fellowship, AGAUR, Secretary of Universities and Research (Govt of Catalonia, Spain). "*Advancing Magnetic Resonance Imaging against liver cancer*". **Fund**: €144,300. **Role**: principal investigator (fellow). **Duration**: 01/01/2022-31/12/2024. **Code**: 2020 BP 00117.

UCL Fellowship 2017 — University College London Centre for Medical Image Computing *Pump-priming Award*: "*Enabling multi-site high precision spinal cord MRI*". **Fund**: GBP 23 900, including GBP 3500 for a research visit at New York University (USA). **Role**: principal investigator (fellow). **Duration**: 01/07/2017-30/06/2018.

PRIZES AND AWARDS

2021 — **3rd prize**, 2021 International Society for Magnetic Resonance in Medicine (ISMRM) MR of Cancer Study Group, Trainee competition for abstract Grussu F et al, Proc of ISMRM 2021, p.0699.

2021 — Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.0699, ISMRM 2021).

2020 — Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.1035, ISMRM 2020).

2020 — **2nd prize** (shared), 2020 ISMRM British and Irish Chapter *"Mansfield Research Innovation Award"* for abstract Grussu F et al, Proc of ISMRM 2020.

2019 — **1st prize** in the "*Multi-dimensional Diffusion Imaging*" (MUDI) challenge at 2019 CDMRI MICCAI Workshop (Shenzhen, China, 17/10/2019) (**Team**: Grussu F, Blumberg SB, Ianus A, Mertzanidou T, Alexander DC; **Method**: SARDU-Net).

2018-2020 — **Elected trainee representative** for the *White Matter Study Group* of the International Society for Magentic Resonance in Medicine (ISMRM).

2018 & 2019 — **"Distinguished reviewer"** Award for Magnetic Resonance in Medicine, awarded at the 2018 and 2019 ISMRM annual meetings.

2018 — Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.466, ISMRM 2018).

2017 Poster short-listed for presentation at the 2017 ISMRM *Diffusion study group* (Grussu et al, p.3399, ISMRM 2017).

2017 Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.3399, ISMRM 2017).

2016 Abstract submission among best 5 in the "*Validation*" session, ISMRM workshop *Breaking the barriers of diffusion MRI*.

2016 Poster short-listed for presentation at the 2016 ISMRM *Diffusion study group* (Grussu et al, p.2009, ISMRM 2016).

2015 Young Investigators poster competition finalist (80 selected), European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) 2015.

2015 Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.0909, ISMRM 2015).

2015 Merit Award ***Magna cum Laude***, abstract (Grussu et al, p.0154, ISMRM 2015).

2013 Award for best residents graduating in 2012, Mòguru village council, Italy (1st prize).

2013 Poster short-listed as a finalist of the 2013 ISMRM *White Matter Study Group* poster competition.

2012-2015 UCL School of Life and Medical Sciences Grand Challenge Studentship worth, funding a full-time 3-year PhD degree at University College London (worth GBP 59,000).

2012 Award for the 2012 *Gruppo Nazionale di Bioingegneria* (GNB, i.e. Italian National Bioengineering Group) Master's Degree thesis prize (Sept. 2012).

2008-2011 Sardinian regional government "*Assegno di Merito*" award (for excellence in Academic Studies, obtained yearly from 2008 to 2011).

2009 Best graduate in Biomedical Engineering of the year, University of Cagliari.

TRAVEL GRANTS

2020 UCL Dept. of neuroinflammantion travel grant funding attendance at the 2020 ISMRM meeting (GBP 400) – awarded for April 2020, unused due to COVID-19.

2016 ISMRM Trainee Stipend for attendance at ISMRM workshop "*Breaking the barriers of Diffusion MRI* (waived registration fees)".

2015, 2016 UCL School of Life and Medical Sciences Travel Grant funding the attendance at the 2015 (GBP 800) and 2016 (GBP 940) ISMRM meetings.

2015 ECTRIMS Travel Grant funding the attendance at the 2015 ECTRIMS meeting in Barcelona (Spain) (EUR 400).

2013, 2015, 2017 Guarantors of Brain Travel Grant funding the attendace at the 2013 (GBP 800), 2015 (GBP 500) and 2017 (GBP 800) ISMRM meetings.

2012-2015 ISMRM Trainee Stipend supporting attendance at the annual meeting (yearly).

INVITED ORAL COMMUNICATIONS

UCL 2022b "*Data-driven, Model-free, Deep Learning Approach for Quantitative MRI Protocol Design*". Microstructure Imaging Meets Machine Learning (MIML) workshop, University College London, London (UK), 13/05/2022.

ISMRM 2022 "*Modeling diffusion in cancer and body*". Educational session: "Diffusion", 2022

annual meeting of the International Society for Magnetic Resonance in Medicine (ISMRM), London (UK), 07/05/2022.

UCL 2022a — "*Diffusion MRI signal cumulants and hepatocyte microstructure at fixed diffusion time: Insights from simulations, 9.4T imaging, and histology*". Centre for Medical Image Computing *qMRI interest group*, University College London, London (UK), virtual talk 24/03/2022.

UniTre 2022 — "*Innovating Magnetic Resonance Imaging to fight diseases*". Università della Terza Età (UniTre), Mòguru, Italy, 12/04/2021 (talk in Sardinian language).

UCL 2021 — "*Diffusion-relaxation microstructural MRI of the liver for application in oncology*". Centre for Medical Image Computing *qMRI interest group*, University College London, London (UK), virtual talk 22/04/2021.

BCNatal 2021 — "*Diffusion-relaxation microstructural MRI of the liver for application in oncology: initial experience*". BCNatal Fetal Medicine Research Centre virtual seminar, Hospital Clinic and Sant Joan de Déu, Universitat de Barcelona, Barcelona (Spain) 18/01/2021.

BIC ISMRM 2020 — "*SARDU-Net: a new method for model-free, data-driven experiment design in qMRI*". ISMRM British and Irish Chapter post-grad virtual meeting, 17/09/2020.

University of Verona 2019 — "*Diffusion MRI data harmonisation*". 2019 School on Brain Connectomics, University of Verona (Italy), 24/09/2019.

UCL workshop 2019 — "*Insight on spinal cord microstructure from time-dependent diffusion*". Spinal cord MRI workshop, UCL (UK), 21/01/2019.

ISMRM Italian Chapter 2018 — "*Axonal dispersion from diffusion MRI: a new marker of microstructural damage*". Italian Association for Magnetic Res. in Medicine, Padua (Italy), 10/05/2018.

King's College London 2018 — "*Microstructural imaging of the human spinal cord: insights from in vivo and ex vivo data*". Inst. of Psychiatry, Psychology and Neuroscience, KCL (UK) 19/03/2018.

UCL workshop 2018 — "*Histological validation of neurite dispersionfrom diffusion MRI in MS*". Mult. sclerosis: translating eng. innovation into the clinic, UCL (UK) 31/01/2018.

Polytechnique Montreal 2017 — "*Advanced microstructural imaging in the human spinal cord*". NeuroPoly Lab seminar, Montreal (Canada), 16/11/2017.

New York University 2017 — "*Quantitative MRI of the spinal cord: challenges, feasibility and future perspectives*". Department of Radiology, NY City (USA), 13/10/2017.

University of Cagliari 2015 — "*Advanced diffusion-weighted MRI of the human spinal cord: feasibility and future directions in multiple sclerosis*". Fac. of Engineering, Cagliari (Italy), 24/07/2015.

Spinal Cord MRI Workshop 2015 — "*Histological validation of quantitative MRI methods*". 2nd Spinal Cord MRI Workshop, Toronto (Canada), 06/06/2015.

INVITED CONFERENCE CHAIRING

ISMRM 2022 — **Moderator** of oral "power pitch" scientific section "Motion correction", 10/05/2022, 2022 annual meeting of the International Society for Magnetic Resonance in Medicine (ISMRM).

ISMRM 2021 — **Moderator** of oral scientific section "Microstructure: Modelling Gray & White Matter Diffusion", 19/05/2021, 2021 virtual annual meeting of the ISMRM.

ISMRM 2021 — **Facilitator** of poster session "Diffusion Applications: Brain & Spine", 18/05/2021, 2021 virtual annual meeting of the ISMRM.

ORGANISATION OF SCIENTIFIC EVENTS

MIS ISMRM 2021 — **Member Initiated Symposium** at ISMRM 2020: "Looking Beyond Axons: Imaging the Immune System in White Matter", 19/05/2021. **Organisers**: Cohen-Adad J, Grussu F, Kolind S.

WMSG ISMRM 2019 — **ISMRM White Matter Study Group Virtual meeting**: "Myelin Imaging in the Spinal Cord at High Field", 27/06/2019, joint meeting with the High-field Study Group. **Organiser**: Grussu F. **Chair**: Cohen-Adad J.

MIS ISMRM 2019 — **Member Initiated Symposium** at ISMRM 2019: "Completing the Circle: Moving Multi-Parametric Neuro MRI into Clinical Practice and Trials", 15/05/2019. **Organisers**: Vrenken H, Cohen-Adad J, Grussu F.

CDMRI 2018 — **MICCAI Workshop:** Computational Diffusion MRI (CDMRI) 2018 (Granada, scheduled for 20/09/2018). **Organisers:** Bonet-Carne E (UCL), Grussu F (UCL), Ning L (Harvard), Sepehrband F (USC), Tax C (Cardiff University).

MUSHAC Challenge 2018 — **MICCAI Challenge:** Multi-shell dMRI harmonisation and enhancement (MUSHAC, part of CDMRI 2018). **Organisers:** Bonet-Carne E (UCL), Grussu F (UCL), Ning L (Harvard), Sepehrband F (USC), Tax C (Cardiff University).

CDMRI 2017 — **MICCAI Workshop:** Computational Diffusion MRI (CDMRI) 2017 (Quebec City, 10/09/2017). **Organisers:** Grussu F (UCL), Kaden E (UCL), Ning L (Harvard), Tax C (Cardiff University), Veraart J (NYU).

Data Harmonisation Challenge 2017 — **MICCAI Challenge:** Diffusion MRI data harmonisation (part of CDMRI 2017). **Organisers:** Grussu F (UCL), Kaden E (UCL), Ning L (Harvard), Tax C (Cardiff University), Veraart J (NYU).

Spinal Cord MRI Workshop 2016 — **Workshop:** 3rd Spinal Cord MRI Workshop, Singapore, 13/05/2016. **Organisers:** Cohen-Adad J & De Leener B (Polytechnique Montreal), Grussu F & Prados F (UCL), Summers P (University of Modena).

Spinal Cord Grey Matter Segmentation Challenge 2016 — **Challenge:** Grey Matter Segmentation: What's there and What's next? (part of SC MRI Workshop 2016). **Organisers:** Cohen-Adad J, Prados F, Landman B, Wheeler-Kingshott C, Summers P, Dupont S, Yiannakas M, Smith S, Gergely D, DeLeener B, Grussu F.

SCIENTIFIC PEER REVIEWING

2021-present — Invited Review Editor for Brain Imaging Methods, Frontiers in Neuroscience.

2016-present — Reviewer for Bipolar Disorders; 2019, 2020 MICCAI CDMRI workshop; Functional Neurology; Frontiers; Human Brain Mapping; Journal of Magnetic Resonance Imaging; Journal of Neuroscience Methods; Magnetic Resonance in Medicine; NeuroImage; IEEE Transactions on Medical Imaging; NMR in Biomedicine; 2019, 2021 and 2022 ISMRM annual meeting; 2021 ISMRM BIC-Iberian Chapter post-grad meeting; 2021 Iberian Chapter annual meeting.

PROJECT SUPERVISION

UCL 2018/2019 — **Project co-supervision:** "*Improving the differential diagnosis between Neuromyelitis Optica Spectrum Disorder and Multiple Sclerosis using MRI*". **Degree:** MRes in "Clinical Neuroscience", Queen Square Institute of Neurology, University College London (UCL, London, UK). **Supervised in:** 2018/2019.

UCL 2018/2019 — **Project co-supervision:** "*Evaluation of quantitative MRI indices reproducibility across scanner upgrade*". **Degree:** MSc in "Advanced neuroimaging", Queen Square Institute of Neurology, University College London (UCL, London, UK). **Supervised in:** 2018/2019

UCL 2017/2018 — **Project co-supervision:** "*Investigation of multi-component T1 relaxation at 3 Tesla*". **Degree:** MSc in "Advanced neuroimaging", Queen Square Institute of

Neurology, University College London (UCL, London, UK). **Supervised in:** 2017/2018.

UCL 2015/2016 **Project co-supervision:** "*Evaluation of strategies for co-registration between quantitative and anatomical magnetic resonance images of the human spinal cord*". **Degree:** MSc in "Advanced neuroimaging", Queen Square Institute of Neurology, University College London (UCL, London, UK). **Supervised in:** 2015/2016.

TEACHING EXPERIENCE

UCL Lecture **Lecture:** "*Image optimisation: SNR, CNR and sources of artifacts*". **Degree:** MSc in "Advanced neuroimaging", Queen Square Institute of Neurology, University College London (UCL, London, UK). **Conveyed:** 2019/20, 2017/18, 2016/17, 2015/16.

UCL Workshop **Workshop:** Hands-on with a portable MRI scanner (link to device). **Degree:** MSc in "Advanced neuroimaging", Queen Square Institute of Neurology, University College London (UCL, London, UK). **Conveyed:** 2017/18, 2016/17, 2015/16.

UniPV Workshop **Workshop:** "*Model fitting for quantitative MRI*". **Degree:** MEng in "Biomedical Engineering", University of Pavia (Pavia, Italy). **Conveyed:** 2016/17.

UCL Lecture **Lecture:** "*Magnetic resonance image formation*". **Degree:** MSc in "Advanced biomedical imaging", Centre for Advanced Biomedical Imaging, University College London (UCL, London, UK). **Conveyed:** 2015/16.

RELEASED RESEARCH SOFTWARE AND DATA

Repositories freely available through GitHub (http://fragrussu.github.io).

2022 **MChepato**: Code and synthetic data for Grussu et al, MRM 2022 (link).

2020 **qMRI-Net**: MRI signal model fitting based on artificial intelligence (link).

2020 **SARDU-Net**: data-driven, model-free quantitative MRI protocol design (link).

2019 **MyRelax**: tools for myelin and relaxation MRI analyses (link).

2019 **MRItools**: tools for handling and managing research MRI scans (link).

2016 **StructureTensorToolbox**: tools for analysis of 2D histological images (link).

PUBLIC ENGAGEMENT

2022 "*Innovating Magnetic Resonance Imaging to fight diseases*". Università della Terza Età (UniTre), Mòguru, Italy (12/04/2021). Talk given to a general audience in Sardinian language).

2017 "*Why to get vaccinated and avoid misinformation: the scientific method in modern medicine*". Event for a general audience in Italian and Sardinian, Mòguru, Italy (17/08/2017). Organisers: Grussu F, Tur C, Coccollone E, Broccia S.

2015 Participation at *MS Frontiers 2015* (29-30/06/2015), organised by the UK Multiple Sclerosis Society and bringing together researchers and Multiple Sclerosis patients.

2013 UCL stall at *Science Uncovered*, annual European Researcher Night (28/09/2013), London Science Museum.

CONFERENCE & WORKSHOP PROCEEDINGS: FIRST AUTHORSHIP

ISMRM 2022 — "*Histological correlates of DR-HIGADOS microstructural metrics in the mouse and human liver*". Grussu F et al. International Society for Magnetic Resonance in Medicine (ISMRM) 2022 (power-pitch presentation).

ISMRM 2022 — "*Inter-scanner reproducibility and variability assessment of advanced liver diffusion MRI metrics*". Grussu F et al. ISMRM 2022 (d-poster presentation).

ISMRM 2021 — "*DR-HIGADOS: a new diffusion-relaxation framework for clinically feasible microstructural imaging of the liver*". Grussu F et al. ISMRM 2021 (**oral presentation**, ***Magna cum Laude*** award).

ISMRM 2021 — "*Investigating the relationship between diffusion MRI signal cumulants and hepatocyte microstructure at fixed diffusion time*". Grussu F et al. International Society for Magnetic Resonance in Medicine (ISMRM) 2021 (**d-poster presentation**).

ISMRM 2020 — "*SARDU-Net: a new method for model-free, data-driven experiment design in quantitative MRI*". Grussu F et al. ISMRM 2020 (**power-pitch presentation**, ***Magna cum Laude*** award).

ISMRM 2019 — "*Clinically viable g-ratio imaging with unified readout at 3T: evaluation and comparison*". Grussu F et al. ISMRM 2019 (e-poster presentation).

ISMRM 2018 — "*Magnitude versus complex-valued images for spinal cord diffusion MRI: which one is best?*". Grussu F et al. ISMRM 2018 (**oral presentation**, ***Magna cum Laude*** award).

ISMRM 2018 — "*A unified signal readout improves denoising of multi-modal spinal cord MRI*". Grussu F et al. ISMRM 2018 (poster presentation).

ISMRM 2017 — "*Origin of the time dependence of the diffusion-weighted signal in spinal cord white matter*". Grussu F et al. ISMRM 2017 (**oral presentation**).

ISMRM 2017 — "*A unified signal readout for reproducible multimodal characterisation of brain microstructure*". Grussu F et al. ISMRM 2017 (e-poster presentation, ***Magna cum Laude*** award, finalist at the Diffusion Study Group competition).

Brain School 2017 — "*Whole-brain macromolecular tissue volume mapping: A comparison of imaging readouts at 3 Tesla*". Grussu F et al. School of Brain Cells and Circuits "Camillo Golgi". Frontiers ISBN 978-288945-584-3 (**poster presentation**).

ISMRM Scientific Workshop 2016 — "*Optimal histological quantification of neurite orientation dispersion for the validation of diffusion MRI*". ISMRM Scientific workshop "Breaking the barriers of diffusion MRI" (poster presentation + Power Pitch).

ISMRM 2016 — "*Axon diameter distribution influences diffusion-derived axonal density estimation in the human spinal cord:* in silico *and* in vivo *evidence*". Grussu F et al. ISMRM 2016 (poster presentation, finalist at the Diffusion Study Group competition).

ECTRIMS 2015 — "*Quantitative histological validation of NODDI MRI indices of neurite morphology in multiple sclerosis spinal cord*". Grussu F et al. European Committee for Research and Treatment of Multiple Sclerosis (ECTRIMS) 2015 (poster presentation, short-listed for poster prize competition).

MS Frontiers 2015 — "*Histological correlates of NODDI in the multiple sclerosis spinal cord*". Grussu F et al. MS Frontiers 2015, annual scientific meeting of the UK Multiple Sclerosis Society (**oral and poster presentation**).

ISMRM 2015 — "*Quantitative histological correlates of NODDI orientation dispersion estimates in the human spinal cord*". Grussu F et al. ISMRM 2015 (**oral presentation**, ***Magna cum Laude*** award).

ISMRM 2015 — "*Histological metrics confirm microstructural characteristics of NODDI indices in*

multiple sclerosis spinal cord". Grussu F et al. ISMRM 2015 (**oral presentation**, ***Magna cum Laude*** award).

British Chapter of the ISMRM 2014 — "*Characterisation of single-shell NODDI fitting in spinal cord grey and white matter*". Grussu F et al. British Chapter of the ISMRM 2014 (poster presentation).

ISMRM 2014 — "*Neurite orientation dispersion and density imaging of the cervical cord* in vivo". Grussu F et al. ISMRM 2014 (poster presentation).

ISMRM 2014 — "*Single-shell diffusion MRI NODDI with* in vivo *cervical cord data*". Grussu F et al. ISMRM 2014 (poster presentation).

ISMRM Scientific Workshop 2013 — "In vivo *estimation of neuronal orientation dispersion and density of the human spinal cord*". ISMRM Scientific workshop "Multiple sclerosis as a whole-brain disease" (**oral presentation**).

ISMRM 2013 — "*Towards spinal cord microstructure mapping with the neurite orientation dispersion and density imaging*". Grussu F et al. ISMRM 2013 (poster presentation, finalist at the White Matter Study Group poster competition).

conference & workshop proceedings: senior authorship

ISMRM 2019 — "*Sensitivity of NODDI and two-compartment SMT parameter maps in multiple sclerosis*". Johnson D, ..., and Grussu F. ISMRM 2019 (e-poster presentation).

conference & workshop proceedings: co-authorship

ISMRM 2022 — "*A data-driven variability assessment of brain diffusion MRI preprocessing pipelines*". Veraart J et al. ISMRM 2022 (online Gather.town pitch presentation).

ISMRM 2022 — "*Reduced field-of-view multi-shell DWI of the sciatic nerve: A reproducibility assessment*". Boonsuth R et al. ISMRM 2022 (d-poster presentation).

ISMRM 2022 — "*The effect of echo train length and TE range on multi-echo quantitative susceptibility mapping*". Ricciardi A et al. ISMRM 2022 (d-poster presentation).

ISMRM 2022 — "*Deep-learning-informed parameter estimation improves reliability of spinal cord diffusion MRI*". Gong T et al. ISMRM 2022 (oral presentation).

ISMRM 2022 — "*Deep learning voxelwise classification of primary central nervous system lymphoma using DSC-PWI normalized time-intensity curves*". Garcia-Ruiz A et al. ISMRM 2022 (d-poster presentation).

ISMRM 2021 — "*Quantitative multi-modal MRI shows correlations between lesion iron deposition and neuro-axonal density in progressive multiple sclerosis*". Collorone S et al. ISMRM 2021 (d-poster presentation).

ISMRM 2021 — "*Advanced magnetic resonance imaging to study brain tissue alterations in people infected with SARS-COV-2*". Gandini Wheeler-Kingshott CAM et al. ISMRM 2021 (d-poster presentation).

ISMRM 2021 — "*Assessing proximal and distal peripheral nerve damage in relapsing-remitting multiple sclerosis using magnetisation transfer ratio*". Yiannakas M et al. ISMRM 2021 (d-poster presentation).

ISMRM 2021 — "*Associations between cervical cord sodium concentration, neuronal density and macromolecular tissue volume in spinal cord injury*". Solanky B et al. ISMRM 2021 (oral presentation).

ISMRM 2021 — "*Evaluation of quantitative MRI parameters reproducibility across a major scanner upgrade: spinal cord diffusion weighted (DW) imaging*". Boonsuth R et al. ISMRM 2021 (d-poster presentation).

ISMRM 2020 "*Acquiring and predicting MUlti-dimensional DIffusion (MUDI) data: an open challenge*". Pizzolato M et al. ISMRM 2020 (oral presentation).

ISMRM 2020 "*QuaSI-MTR (qualitative scans for imaging MTR): deep-learned MTR from routine scans using U-nets*". Ricciardi A et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Co-electrospun spinal cord phantom for diffusion MRI*". Zhou F et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*A pilot in vivo investigation of peripheral nerve damage in multiple sclerosis using magnetisation transfer ratio*". Yiannakas M et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Reduced field-of-view multi-shell diffusion-weighted imaging of the sciatic nerve: Application to multiple sclerosis*". Yiannakas M et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*New potential MRI markers of glial scarring and tissue damage in multiple sclerosis spinal cord pathology using diffusion MRI*". Palombo M et al. ISMRM 2020 (power-pitch presentation).

ISMRM 2020 "*SENSE reconstruction with simultaneous 2D phase correction and channel-wise noise removal (SPECTRE)*". Powell E et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Evaluation of quantitative MRI parameters reproducibility across a major scanner upgrade: the example of T1*". Boonsuth R et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Microstructure changes in secondary progressive multiple sclerosis measured using advanced quantitative MRI of the brain and spine*". Battiston M et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Shape and Spatial Pattern Analysis through Covariance-based Estimations of MS lesions: the SSPACE-MS study*". Tur C et al. ISMRM 2020 (d-poster presentation).

ISMRM 2020 "*Quantitative MRI of the spinal cord: reproducibility and normative values across 40 sites*". Alonso-Ortiz E L et al. ISMRM 2020 (oral presentation).

ISMRM 2019 "*Cross-scanner and cross-protocol harmonisation of multi-shell diffusion MRI data: open challenge and evaluation results*". Ning L et al. ISMRM 2019 (oral presentation).

ISMRM 2019 "*Bound Pool Fraction mapping via steady-state MT saturation using single-shot EPI*". Battiston M et al. ISMRM 2019 (oral presentation).

ISMRM 2019 "*Myelin-sensitive indices in multiple sclerosis: the unseen qualities of qualitative clinical MRI*". Ricciardi A et al. ISMRM 2019 (e-poster presentation).

ECTRIMS 2018 "*Neurite Orientation Dispersion and Density Imaging (NODDI) and 23Na MRI in clinically isolated syndrome*". Collorone S et al. ECTRIMS 2018 (poster presentation).

ISMRM 2018 "*Cross-vendor and cross-protocol harmonisation of diffusion MRI data: a comparative study*". Tax C et al. ISMRM 2018 (oral presentation).

ISMRM 2018 "*Consensus acquisition protocol for quantitative MRI of the cervical spinal cord at 3T*". Alley S et al. ISMRM 2018 (oral presentation).

ISMRM 2018 "*Biophysically meaningful MRI features for accurate classification of multiple sclerosis phenotypes*". Ricciardi A et al. ISMRM 2018 (poster presentation).

ISMRM 2018 "*Acceleration strategies for whole brain quantitative Magnetization Transfer Imaging*". Battiston M et al. ISMRM 2018 (e-poster presentation).

ISMRM 2018 "*Are we seeing any better? A comprehensive comparison of myelin biomarkers in the*

healthy and multiple sclerosis post mortem spinal cord". Battiston M et al. ISMRM 2018 (oral presentation).

ECTRIMS 2017 "*Brain network organisation and cognitive performance in the clinically isolated syndromes*". Ooi J et al. ECTRIMS 2017 (poster presentation).

ECTRIMS 2017 "*Application of Neurite Orientation Dispersion and Density Imaging (NODDI) in clinically isolated syndrome (CIS)*". Collorone S et al. ECTRIMS 2017 (poster presentation).

Frontiers 2017 "*Investigation of cerebellar microstructure with two-compartment Spherical Mean Technique and T1w/T2w myelin weighting*". Savini G et al. School of Brain Cells & Circuits "Camillo Golgi" (poster presentation; abstract published in Frontiers).

ISMRM 2017 "*A ranking of pipelines for optimal co-registration of anatomical and diffusion weighted images of the cervical spinal cord*". Alley S et al. ISMRM 2017 (accepted for Power Pitch oral presentation).

ISMRM 2017 "*Diffusion anisotropy in breast cancer tissue corresponds to spatial patterns of collagen alignment from histology*". Bailey C et al. ISMRM 2017 (accepted for Power Pitch oral presentation).

ISMRM 2017 "*Boundary shift integral to compute brain and cervical spinal cord longitudinal atrophy on the same 3D T1 brain images in multiple sclerosis*". Prados F et al. ISMRM 2017 (accepted for oral presentation).

ISMRM 2017 "*Impact of acquisition strategies and spherical deconvolution algorithms on brain connectivity mapping in early multiple sclerosis*". Tur C et al. ISMRM 2017 (accepted for oral presentation).

ISMRM 2017 "*Quantifying Reconstruction Uncertainty with Image Quality Transfer*". Tanno R et al. ISMRM 2017 (accepted for poster presentation).

ISMRM 2017 "*Characterisation of cerebellar microstructure with Spherical Mean Technique*". Savini G et al. ISMRM 2017 (accepted for oral presentation).

ISMRM 2017 "*Optimal framework for quantitative magnetization transfer imaging of small structures*". Battiston M et al. ISMRM 2017 (accepted for oral presentation).

ISMRM 2017 "*Reproducible fast T1 mapping of the human cervical spinal cord in vivo*". Battiston M et al. ISMRM 2017 (accepted for poster presentation).

ECTRIMS 2016 "*Computing spinal cord atrophy using the boundary shift integral: a more powerful outcome measure for clinical trials?*". Prados F et al. ECTRIMS 2016 (poster presentation).

ECTRIMS 2016 "*Neurite orientation dispersion and density imaging (NODDI) of the spinal cord in relapsing remitting multiple sclerosis*". Tona F et al. ECTRIMS 2016 (poster presentation).

ECTRIMS 2016 "*Neurite orientation dispersion and density imaging (NODDI) reflects early microstructural brain tissue changes in clinically isolated syndrome (CIS)*". Collorone S et al. ECTRIMS 2016 (poster presentation).

ECTRIMS 2016 "*No differences in spinal cord DTI abnormalities between neuromyelitis optica spectrum disorder and multiple sclerosis*". Cortese R et al. ECTRIMS 2016 (poster presentation).

ISMRM 2016 "In vivo *quantitative magnetisation transfer in the cervical spinal cord using reduced field-of-view imaging: a feasibility study*". Battiston M et al. ISMRM 2016 (oral presentation).

ISMRM 2016 "*Reduced field-of-view diffusion-weighted imaging of the lumbosacral enlargement: a pilot* in vivo *study of the healthy spinal cord using a clinical 3T MR system*". Yiannakas M et al. ISMRM 2016 (e-poster presentation).

ISMRM 2016 "*Atrophy computation in the spinal cord using the boundary shift integral*". Prados F et al. ISMRM 2016 (oral presentation).

AAN 2016 "*No Differences in spinal cord white and grey matter diffusion abnormalities between neuromyelitis optica spectrum disorder and multiple sclerosis*". Cortese R et al. American Accademy of Neurology (AAN) 2016 (poster presentation).

AAN 2016 "*Neurite orientation dispersion and density imaging (NODDI) at the onset of clinically isolated syndrome (CIS): new insights in the early microstructural brain tissue changes*". Collorone S et al. AAN 2016 (dual presentation).

ISMRM 2015 "*Combined sodium-NODDI: towards quantitative* in vivo *intracellular and intraneurite sodium measures at 3T*". Solanky B et al. ISMRM 2015 (e-poster presentation).

ISMRM 2014 "*An investigation of brain neurite density and dispersion in multiple sclerosis using single shell diffusion imaging*". Magnollay L et al. ISMRM 2014 (poster presentation).

ECTRIMS 2013 "*Application of neurite orientation dispersion and density imaging (NODDI) to relapsing remitting multiple sclerosis (RRMS)*". Magnollay L et al. ECTRIMS 2013 (poster presentation).

ECTRIMS 2013 "*Neurite orientation dispersion and density imaging in the multiple sclerosis spinal cord*". Kearney H et al. ECTRIMS 2013 (e-poster presentation).

NCM 2012 "*Algorithms for shaping the dynamics of a bidirectional neural interface*". Semprini M et al. Society for the Neural Control of Movement (NCM) 2012 (poster presentation).

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