Gloria Castellazzi

Curriculum Vitae

Personal Data

ECTRIMS Post-doc MRI researcher at Queen Square MS Centre, UCL, London, UK

Address: NMR Research Unit, Queen Square MS Centre, Department of Neuroinflammation, UCL Institute of Neurology, Russell Square, London, WC1N 3BG, UK

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Education

11/2008 – 11/2011 (viva 02/2012) PhD in Bioengineering and Bioinformatics

Department of Electrical, Computer and Biomedical Engineering, University of Pavia, via Ferrata 5, 27100 Pavia (Italy) - C. Mondino National Neurological Institute, via Mondino 2, 27100 Pavia (Italy)

Thesis: *"Advanced Processing of DSC-MRI in gliomas in presence of* ***contrast*** *leakage. A study on 30 patients."* Advisor: Prof. Giovanni Magenes (University of Pavia)

01/2004 - 02/2008 Master degree in Biomedical Engineering (score 110/110)

Department of Electrical, Computer and Biomedical Engineering, University of Pavia, via Ferrata 5, 27100 Pavia (Italy)

Thesis: *"Methods for the analysis of cardiotocographic signals."* Advisor: Prof. Giovanni Magenes (University of Pavia)

10/2000 - 12/2003 Bachelor degree in Biomedical Engineering (score 100/110)

Department of Electrical, Computer and Biomedical Engineering, University of Pavia, via Ferrata 5, 27100 Pavia (Italy)

Thesis: "Classification of the *cardiotocographic signal using Support Vector Machine.*" Advisor: Prof. Giovanni Magenes (University of Pavia)

Professional experience

11/2017 - present — ECTRIMS Post-doc MRI research fellow

Research field: Advanced MRI and machine learning techniques applied for the study of Multiple Sclerosis.
Techniques: Magnetic Resonance Imaging (MRI), functional MRI (task-related fMRI, resting state fMRI), functional connectomics, machine learning, deep learning.

Address: NMR Research Unit, Queen Square MS Centre, Department of Neuroinflammation, UCL Institute of Neurology, Russell Square, London, WC1N 3BG, UK

10/2017 - present — Adjunct professor at the University of Pavia for the course "Bioimmagini Multimodali" (Prof. G. Magenes).

11/2011 – 10/2017 — Post-doc MRI researcher

Research field: analysis of the functional impairments of neurodegenerative diseases (dementia, multiple sclerosis) by means of advanced MRI techniques; functional connectomical studies for the detection of impairments in the relationship among brain areas of dementia patients; study of the dynamical properties of functional resting state MRI signals. Machine learning techniques combined to advanced functional MRI methods for the automatic classification of dementia.
Techniques: Magnetic Resonance Imaging (MRI), functional MRI (task-related fMRI, resting state fMRI), functional connectomics, machine learning.

Address: Department of Electrical, Computer and Biomedical Engineering, University of Pavia, via Ferrata 5, 27100 Pavia (Italy) - C. Mondino National Neurological Institute, via Mondino 2, 27100 Pavia (Italy)

06/2012 – 12/2012 — Post-doc MRI research fellow

Research field: development of advanced pipelines for the study of static and dynamical properties of resting state fMRI (rs-fMRI) signals.

Address: NMR Research Unit, Queen Square MS Centre, Department of Neuroinflammation, UCL Institute of Neurology, Queen Square, London, WC1N 3BG, UK

12/2012 – 04/2013 Post-doc MRI research fellow (Du Pré grant)

Research field: development of advanced pipelines for the study of static and dynamical properties of resting state fMRI (rs-fMRI) signals.

Address: NMR Research Unit, Queen Square MS Centre, Department of Neuroinflammation, UCL Institute of Neurology, Queen Square, London, WC1N 3BG, UK

Grants received /Awards/Honours

11/2008 – 11/2011	PhD grant from C. Mondino National Neurological Institute
05/2013	Du Pré grant from the Multiple Sclerosis International Federation (MSIF)
05/2014	ISMRM Magna cum Laudae Award
02/2017	ECTRIMS Postdoctoral Research fellowship Exchange Program award

Memberships

2010 – present	Member of International Society for Magnetic Resonance in Medicine (ISMRM)
2010 – present	Member of the Italian ISMRM Chapter

Spoken languages

- Italian (mother language)
- English (C1)
- French (B2)

Publications

1. Casiraghi L, Alahmadi AAS, Monteverdi A, Palesi F, **Castellazzi G**, Savini G, Friston K, Gandini Wheeler-Kingshott CAM, D'Angelo E (2019) *I see your effort: Force-Related BOLD Effects in an Extended Action Execution-Observation Network Involving the Cerebellum*. Cereb Cortex. 2019 Mar 1;29(3):1351-1368. doi: 10.1093/cercor/bhy322.
2. Savini G, Pardini M, **Castellazzi G**, Lascialfari A, Chard D, D'Angelo E, Wheeler-Kingshott CAM (2019) *Default mode network structural integrity and cerebellar connectivity predict information processing speed deficit in multiple sclerosis.* Front Cell Neurosci. DOI: 10.3389/fncel.2019.00021
3. **Castellazzi G**, Debernard L, Melzer TR, Dalrymple-Alford JC, D'Angelo E, Miller DH, Gandini Wheeler-Kingshott CAM, Mason DF (2018) Functional Connectivity Alterations Reveal Complex Mechanisms Based on Clinical and Radiological Status in Mild Relapsing Remitting Multiple Sclerosis. Frontiers in Neurology, 9:1-15. https://doi.org/10.3389/fneur.2018.00690
4. **Castellazzi G**, Bruno SD, Thoosy AA, Casiraghi L, Palesi F, Savini G, D'Angelo E, Gandini Wheeler-Kinsgshott CAM (2018) Prominent changes in cerebro-cerebellar functional connectivity during continuous cognitive processing. Front Cell Neurosci. DOI: 10.3389/fncel.2018.00331.

5. Palesi F, De Rinaldis A, Vitali P, **Castellazzi G**, Casiraghi L, Germani G, Bernini S, Anzalone N, Cotta Ramusino M, Denaro FM, Sinforiani E, Costa A, Magenes G, D'Angelo E, Gandini Wheeler-Kingshott CAM, Micieli GR. *Specific patterns of white matter alterations help distinguishing Alzheimer's and Vascular Dementia.* Front Neurosci 2018 https://doi.org/10.3389/fnins.2018.00274

6. Wheeler-Kingshott C, Reimer F, Palesi F, Ricciardi A, **Castellazzi G**, Golay X, Prados F, Solanky B, D'Angelo E. *Challenges and perspectives of functional sodium imaging (fNaI).* Front Neurosci (2018) https://doi.org/10.3389/fnins.2018.00810.

7. Palesi F, De Rinaldis A, **Castellazzi G**, Calamante F, Muhlert N, Chard D, Tournier JD, Magenes G, D'Angelo E, Gandini Wheeler-Kingshott CAM. *Contralateral cortico-ponto-cerebellar pathways reconstruction in humans in vivo: implications for reciprocal cerebro-cerebellar structural connectivity in motor and non-motor areas.* Sci Rep. 2017 Oct 9;7(1):12841. doi: 10.1038/s41598-017-13079-8.

8. Matrone G, Ramalli A, Savoia AS, Quaglia F, **Castellazzi G**, Morbini P, Piastra M. *An Experimental Protocol for Assessing the Performance of New Ultrasound Probes Based on CMUT Technology in Application to Brain Imaging.* JoVE, 2017 May doi:10.3791/55798

9. Palesi F, **Castellazzi G**, Casiraghi L, Sinforiani E, Vitali P, Gandini Wheeler-Kingshott CAM, D'Angelo E. *Exploring patterns of alteration in Alzheimer's disease brain networks: a combined structural and functional connectomics analysis*. Front. Neurosci., September 2016 | http://dx.doi.org/10.3389/fnins.2016.00380.

10. Palesi F, Tournier JD, Calamante F, Muhlert N, **Castellazzi G**, Chard D, D'Angelo E, Wheeler-Kingshott CG. *Reconstructing contralateral fiber tracts: methodological aspects of cerebello-thalamocortical pathway reconstruction.* Funct Neurol. 2015 May 4:1-10. [Epub ahead of print]

11. **Castellazzi G**, Palesi F, Casali S, Vitali P, Sinforiani E, Wheeler-Kingshott CAM, D'Angelo E. *A comprehensive assessment of resting state networks: bidirectional modification of functional integrity in cerebro-cerebellar networks in dementia.* Front. Neurosci. July 2014. doi: 10.3389/fnins.2014.00223

12. Shiroishi MS**, **Castellazzi G****, Boxerman JL**, D'Amore F, Essig M, Nguyen TB, Provenzale JM, Enterline DS, Anzalone N, Dörfler A, Rovira A, Wintermark M, Law M, *Principles of T2*-weighted dynamic susceptibility contrast MRI technique in brain tumor imaging*. J Magn Reson Imaging. May 2014. doi: 10.1002/jmri.24648.

13. Palesi F, Tournier DJ, Calamante F, Muhlert N, **Castellazzi G**, Chard D, D'Angelo E, Wheeler-Kingshott CAM. *Controlateral cerebello-thalamo-cortical pathways with prominent involvement of associative areas in human in-vivo.* Brain Struct Funct. 2014 doi: 10.1007/s00429-014-0856-z.

14. Caverzasi E, Pichiecchio A, Poloni GU, Calligaro A, Pasin M, Palesi F, **Castellazzi G**, Pasquini M, Biondi M, Barale F, Bastianello S. *Magnetic resonance spectroscopy in the evaluation of treatment efficacy in unipolar major depressive disorder: a review of the literature*. Funct Neurol, 27(1):13-22, 2012

15. Palesi F, Vitali P, Chiarati P, **Castellazzi G**, Caverzasi E, Pichiecchio A, Colli Tibaldi E, D'Amore F, Sinforiani E, Bastianello S. *DTI and MR volumetry of hippocampus-PC/PCC circuit: in search of early micro- and macro-structural signs of Alzheimer's disease*. Neurol Res Int, 2012

** Co-first author

Research Interests

- Advanced Magnetic Resonance Imaging (MRI): functional MRI (task-related fMRI, resting state fMRI), diffusion MRI (DWI, DTI), perfusion MRI (ASL, DSC_MRI, DCE-MRI).
- Development and optimisation of MR sequences.
- Analysis of the dynamical properties of functional connectivity (FC) in resting state networks (RSNs) in both healthy and pathological subjects;
- Machine learning on MRI data (development of predictive models of disease progression through data mining application).
- Deep learning on MRI data (development of a post-processing protocol for the quality assessment of MRI acquisitions).

Main collaborations:
- Prof. E. D'Angelo (University of Pavia, Italy)
- Prof. G. Magenes (University of Pavia, Italy)
- Dr. D. Mason and Dr. T. Melzer (NZBRI, New Zealand)
- Prof. Olga Ciccarelli, Dr. J. Chataway, Dr. A. Toosy, Dr. D. Chard (UCL, Uk)
- Prof. R. Bergamaschi, Prof. A. Pichiecchio, Prof. C. Tassorelli and Dr. D. Martinelli (IRCCS Mondino, Pavia, Italy)
- Dr. Paul Summers (IEO, Milan, Italy).

Research support/Activities

- PROJECT 1 (UCL, ongoing project): development of multi-band multi-echo sequences for functional MRI acquisitions.
- PROJECT 2 (UCL, CMIC, ongoing project): development of an advacend post-processing protocol for the automatic evaluation of MRI acquisition quality using deep learning strategies.
- PROJECT 3 (UCL, ongoing ECTRIMS project): Development of a clinical decision system based on characterising shared and specific functional features of MS subtypes.
- PROJECT 4 (UCL-IRCCS Mondino, ongoing project): Development of advanced methods for the static and dynamic analysis of functional connectivity in migraine.
- PROJECT 5 (UCL, ongoing project): advanced MRI data analyses for the MS-SMART project (Dr. J. Chataway, UCL).
- PROJECT 6 (UCL-NZBRI, ongoing project): Classification of relapsing-remitting multiple sclerosis (RRMS) subjects with different disease duration using machine learning approaches combined with resting state fMRI (rs-fMRI)-derived mectrics.
- PROJECT 7 (UCL-UNIPV-IRCCS Mondino, ongoing project): Classification of dementia-like diseases using machine learning strategies on advanced MRI metrics. This study has been carried out in collaboration with Prof. Egidio D'angelo (University of Pavia) and Prof. Claudia Gandini Wheeler-Kingshott (UCL Institute of Neurology, London, UK).
- PROJECT 8 (UCL-NZBRI, completed project): Study of the functional connectivity changes in relapsing remitting MS (RRMS) depending on disease duration. This study is carried out in collaboration with Dr. Deborah Mason, Dr. John Darlymple-Alford and Dr. Tracy Melzer of the New Zealand Brain Research Centre (NZBRI) in Chrstchurch.

- PROJECT 9 (UCL-UNIPV, completed project): study of the dynamical *functional connectivity* (FC) changes in Resting State Networks (RSNs) before, during and after a *naturalistic* fMRI stimulation involving a narrated story.

Additional information

Talks/Lectures:

- QSMS Centre Departmental Seminar. 2019 June 20, London, UK – Castellazzi G, "*Potential or resting state fMRI for the study of Multiple Sclerosis.*"
- Workshop "Advanced fMRI techniques" within the "Innovation and Therapy in Glaucoma" meeting – London, 6th-8th June 2019.
- QSMS Centre Departmental Seminar. 2017 March 9, London, UK – Castellazzi G, "*Sensitivity of resting state fMRI to multiple sclerosis pathology.*"
- ISMRM 2016 Italian Chapter Meeting. 2016 February 2-4, Bologna, Italy – Castellazzi G, Debernard L, Melzer T, Dalrymple-Alford J, D'Angelo E, Miller D, Mason D, Wheeler-Kingshott CAM, "*Machine learning approach combined with graph theory on resting state fMRI to classify relapsing remitting Multiple Sclerosis with different disease duration.*"
- 31st ECTRIMS Annual Meeting. 2015 October 7-10, Barcelona, Spain – Castellazzi G, Debernard L, Melzer T, Dalrymple-Alford J, D'Angelo E, Miller D, Wheeler-Kingshott CAM, Mason D, "*Functional connectivity impairment shows distinct sensory and cognitive patterns in relapsing remitting Multiple Sclerosis with different disease duration*."
- ISMRM 2015 Annual Meeting - Brain functions study group. 2015 May 30 - June 5, Totonto, Ontario, Canada – Castellazzi G, Palesi F, Bruno S, Toosy A, D'Angelo E, Wheeler-Kingshott CAM, *"Dynamic changes in whole brain functional connectivity during story listening"*.
- BIOQUEST 2013, Neuroimaging Workshop. 2013 August 8-19, Amrita University, Kollam, Kerala, India – Castellazzi G, Palesi F, Wheeler-Kingshott CAM, D'Angelo E, *"Alterations of resting state networks in dementia: reduction of functional integrity and compensatory mechanism."*
- ISMRM 2014 Annual Meeting. 2014 May 2-9, Milan, Italy – Castellazzi G, Palesi F, Bruno S, Toosy A, D'Angelo E, Wheeler-Kingshott CAM,*"Dynamic changes of Resting State Networks depict short-term plasticity of the brain."*

Teaching activity:

2017 - 2019 2h Lecture "Quantitative MRI" at UCL, for the *MSc Clinical Neuroscience and MSc Clinical Neurology* courses.

2009 – 2019 12 h seminars on MRI and advanced MRI techniques within the course "Multimodal Bioimaging" (Faculty of Biomedical Engineering, University of Pavia) directed by Prof. G. Magenes.

Attended courses/workshops:

- FSL course 2013, September 19-23, Bristol, UK
- 2nd HBP Education Workshop, 2015 March 15-18, CHUV, Losanne, CH
- 2015/2016/2018 International School of Brain Cells & circuits "Camillo Golgi", Erice, IT

- 2010-2019 ISMRM Annual meetings

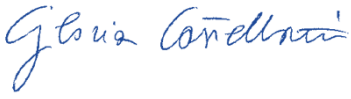
Tutoring/supervisor activity:

- Dr Daniele Martinelli (2019 – UNIPV-IRCCS Mondino, master degree in Neurology)
- Dr Anisha Doshi (2019, UCL, PhD in Neurology)
- Dr Xixi Yang (2018, UCL, PhD in Neurology)
- Mrs Ekaterina Pererva (2019 - UCL, master degree in Physics)
- Miss Valeria Centanino (2018 – UNIPV, master degree in Biology)
- Dr Paolo Vitali (2017 – UNIPV-IRCCS Mondino, PhD in Neuroscience)
- Dr Giovanna Cuzzoni (2017 - UNIPV-IRCCS Mondino, PhD in Neuroscience)
- Mr Simone Cardis (2017, UNIPV, master degree in Biomedical Engineering)
- Dr Giovanni Savini (2016 - UNIMI, PhD in Physics)
- Dr Andrea De Rinaldis (2016 - UNIPV, PhD in Bioengineering and Bioinformatics)
- Miss Stefania Gangi (2011, UNIPV-IRCCS Mondino, bachelor degree in Medicine)
- Mr Elia Tagliani (2015, UNIPV, master degree in Biomedical Engineering)
- Mr Alberto Miglioranza (2015, UNIPV-UNIPD, master degree in Biomedical Engineering)
- Mr Emiliano Grassi (2015, UNIPV, master degree in Psychology)
- Mr Antonio Ricciardi (2015, UNIPV, master degree in Physics)
- Miss Patrizia Chiarati (2015, UNIPV, master degree in Psychology)
- Miss Silvia Rota (2011, UNIPV-IRCCS Mondino, bachelor degree in Medicine)

License:

- September 2017: qualification to Professional Engineer (Italian legislation).

Gloria Castellazzi



London, 12th July 2019