ELSA FOURAGNAN

Brain Research Imaging Center • University of Plymouth • United Kingdom •
+44(0)77 0333 5897 • elsa.fouragnan@plymouth.ac.uk •
www.elsa-fouragnan.com

ACADEMIC CAREER AND EMPLOYMENT

University of Plymouth, UK	UKRI Future Leader Fellow, Decision and Learning Lab Head of Stimulation Laboratory, Brain Research Imaging Centre Lecturer in Cognitive Neuroscience, School of Psychology May 2020 – Present
University of Oxford, UK	Postdoctoral Research Fellow, Decision and Action Lab *Advisor: Prof. Matthew Rushworth* May 2016 – May 2018
University of Glasgow, UK	Postdoctoral Research Fellow, Philiastides Lab *Advisor: Dr. Marios Philiastides* April 2013 – May 2016
DARPA, San Diego, USA	Biomedical Engineer (Research & development) Quantum Applied Sciences & Research, DARPA research March 2008 – April 2009

EDUCATION

University of Trento, Italy University of Southern California, Los Angeles, USA	PhD in Computational Neuroscience *Advisors: Prof. Giorgio Coricelli, Prof. Paolo Avesani*
University of Bordeaux, France	MEng (distinction) in Biomedical Engineering Received in 2008, Polytechnic institute (INP-ENSC)
University of Bordeaux, France	BA (1st class with distinction) in Maths applied to Life Sciences Received in 2005, Victor Segalen, Bordeaux II

GRANTS, FELLOWSHIPS AND AWARDS

RESEARCH GRANTS

UKRI Future Leaders Fellow 2020-2024 (£1,030,995)
PI "Mapping the neural basis of credit assignment for a new targeted intervention in addiction"

Leverhulme 2019-2022: Award to Patric Bach (PI) (£462,995)
Co-I "Social perception as Bayesian hypothesis testing and revision"

Wellcome Trust; WT100973AIA: SI Award to MFS Rushworth (PI) (£1,851,544),
Full postdoctoral at the University of Oxford "Neural mechanisms for foraging in uncertain environments."

BBSRC; grants BB/J015393/1–2 to MG Philiastides (PI) (£397,955 - £260,141)
Full postdoctoral at the University of Glasgow "Spatiotemporal characteristics of reward-based learning"

Praxis Clinical Grant 2012: Award to Remi Neveu (£2000)
Co-I "The role of emotions and impulsivity in eating disorders"

Travel grant for J-1 exchange visitor (6 months), USC, Los Angeles, USA, 2010
PhD visitor Scholar, KAP Economics Department, University of Southern California

PhD European fellowship, 2009-2013
PhD candidate in Cognitive Neuroscience, advised by Prof. Giorgio Coricelli

AWARDS

Vice Chancellor's Award – University of Plymouth - Research and Impact Excellence, 2022
Award for best Neuroscientific contribution (~$20,000) by the Hong Kong Polytechnic University, 2019
Best poster price, Foundation for Focused Ultrasound, Oxford University, September 2019
Best poster price, Neuroeconomics Summer School, Amsterdam University, June 2012
Award for exceptional performance in Mathematics, Atomic Energy Commissariat, Toulouse, 2006

PEER-REVIEWED JOURNAL PUBLICATIONS

* indicates equal contribution
H – index (google scholar): 12
I – 10 index (google scholar): 13
Total number of citations: >700

Komarnyckyj M, Retzler C, Cao Z, Ganis G, Murphy A, Whelan R, **Fouragnan E** *At-risk alcohol users have disrupted valence discrimination during reward anticipation* 2022 Addiction Biology 27 (3), e13174, doi: doi.org/10.1111/adb.13174

Darmani G, Bergmann TO, Butts Pauly, Caskey, de Lecea, Fomenko, **Fouragnan E**, Legon W, Murphy, Nandi T, Phipps, Pinton G, Ramezanpour H, Sallet, Yaakub, Yoo, Chen R. *Non-invasive transcranial ultrasound stimulation for neuromodulation* 2022 Clinical Neurophysiology, 135 (51-73), doi:/10.1016/j.clinph.2021.12.010

Folloni D*, **Fouragnan E ***, Wittmann M, Roumazeilles L, Tankelevitch L, ... *Ultrasound modulation of macaque prefrontal cortex selectively alters credit assignment–related activity and behavior* Science advances 7 (51), 2021 eabg7700

Trudel N, Wittmann MK, Scholl J, Klein-Flügge M, **Fouragnan** E, Tankelevitch L, Rushworth MFS, *Polarity of subjective uncertainty in ventromedial prefrontal cortex changes with behavioural adaptation across time* Nature Human Behavior. 2021 Aug 31. doi: 10.1038/s41562-020-0929-3. PMID: 32868885.

Wittmann M K, **Fouragnan E**, Folloni D, Klein-Flügge M, Chau B, Khamassi M, Rushworth MFS. *Global reward state affects learning, the raphe nucleus, and anterior insula in monkeys.* Nature Communication 11, 3771 (2020). doi:10.1038/s41467-020-17343-w

Lopez-Persem A, Roumazeilles L, Folloni D, Marche K, **Fouragnan E**, Khalighinejad N, Rushworth M, Sallet J *Differential functional connectivity underlying asymmetric reward-related activity in human and non-human primates* PNAS November 10, 2020 117 (45) 28452-28462; doi:10.1073/pnas.2000759117

Fouragnan E, Chau BKH, Folloni D, Kolling N, Verhagen L, Klein-Flügge M, Tankelevitch L, Papageorgiou GK, Aubry JF, Sallet J, Rushworth MFS. *The macaque anterior cingulate cortex translates counterfactual choice value into actual behavioral change.* Nature Neuroscience, 22(5), 797-808. 2019. doi: 10.1038/s41593-019-0375-6

Queirazza F, **Fouragnan E**, Cavanagh J, Steele D, Philiastides M. *Neural signatures of reinforcement learning in unmedicated depressed patients predict response to Cognitive Behavioural Therapy*. Forthcoming – Science Advances. 2019

Folloni D, Verhagen L, Mars R, **Fouragnan E**, Aubry JF, Rushworth MFS, Sallet J. *Non-invasive and reversible manipulation of activity in deep structures of the primate brain using focal ultrasound neurostimulation.* Neuron. 101, 1109–1116. February 2019

Fouragnan E, Retzler C, Philiastides MG. *Separate neural representations of prediction error valence and surprise: Evidence from an fMRI meta-analysis.* Hum Brain Mapp. 2018;00:1–20. March 2018

Fouragnan E, Retzler C, Mullinger K, Philiastides MG. *Spatiotemporal neural characterization of prediction error valence and surprise during reward learning in humans.* Scientific Reports. July 2017 (7):4762.

Pisauro A, **Fouragnan E**, Retzler C, Mullinger K, Philiastides MG. *Neural correlates of evidence accumulation during value-based decisions revealed via simultaneous EEG-fMRI*. Nature Communications. July 2017 (8): 15808.

Neveu R, **Fouragnan E**, Barsumian F, Carrier E, Lai M, Sultan J, Nicolas A, Coricelli G. *Preference for safe rather than risky options in binge eating*. March 2016. Front. Behav. Neurosci. doi: 10.3389/fnbeh.2016.0006

Fouragnan E, Retzler C, Mullinger K, Philiastides M. *Two spatiotemporally distinct value systems shape reward-based learning in the human brain.* August 2015. Nature Communication (6):8107doi: 10.1038/ncomms9107

Neveu R et D, Barsumian F, **Fouragnan E**, Carrier E, Lai M, Sultan J, Nicolas A, Coricelli G. *Improved planning abilities in binge eating.* August 2014. PLoS ONE 9(8):e105657

Fouragnan E, Chierchia G, Greiner S, Neveu R, Avesani P, Coricelli, G. *Reputational priors magnify striatal responses to violation to trust.* February 2013. Journal of Neuroscience 33(8):3602–3611

PREPRINT

Fouragnan E*, Pisauro M*, Arabadzhiyska, Apps M*, Philiastides M*
Neural Implementation of Bayesian mechanisms underlying the continous trade-off between cooperation and competition PsyArXiv 2021

Arabadzhiyska D, Garrod O, **Fouragnan E**, De Luca E, Schyns P, Philiastides M
A common neural currency account for social and non-social decisions bioRxiv 2021

TECHNICAL REPORTS AND SCHOLAR DISSERTATION

Fouragnan E. The Neural Computation of Trust and Reputation. (April 2013) PhD thesis http://eprints-phd.biblio.unitn.it/970/

Matthews R, Soussou W, **Fouragnan E**, Turner P J, Shelby R A. (June, August, October, December 2008) *Wearable Electrophysiological Sensor Array for Detection of Neurotoxic Effects*. Defence Advanced Research Projects Agency Phase II [bi-monthly reports and final report submitted to DARPA]

Matthews R, **Fouragnan E**, McDonald N J, Soussou W, Turner P J, Shelby RA. (August, October 2008*)* *Real-Time Bio-Sensors for Enhanced C2ISR Operator Performance*. Air Force Research Laboratory (AFRL) Phase II [bi-monthly reports and final report submitted to DARPA]

Soussou W, Turner PJ, **Fouragnan E**, Trejo J. (November 2008) *EEG Electrode Noise/Classification trade-off study and CMR/Classification experimentation* [QUASAR internal report]

Fouragnan E, Lofi A, Hugon E, Danoy P. (July 2002) *Which services for wellbeing, stress and anxiety management?* [Technical Reports of Nouvelles Frontières]

INVITED TALK AND CONFERENCE POSTERS PRESENTATIONS

Key speaker:
- International congress o neuromodulation, Barcelona 2022
- Focused Ultrasound Neuromodulation, Mainz, September 2022

Invited guest lecturer: > 10 conferences, seminars, lecture series
Poster presentation: > 25 conferences (as first author or supervisor).

MEDIA COVERAGE

NEWS ARTICLE:

New Medical Life Science: Study shows how low-intensity ultrasonic waves can modulate decision-making process in the brain (2019)
Science Daily, EurekAlert, MedicalXpress, Technology Network, Long Room, The medical news: Low-intensity ultrasound can change decision-making process in the brain (2019)
Focused Ultrasound Fedeereation, news: Focused Ultrasound Used to Identify Behavior-specific Regions of the Brain (2017)
MedicalXpress, Separate brain systems process the consequences of our decisions (2017)

SCIENTIFIC BLOGS, INTERVIEWS:

Neuroscience RSS Feeds - Neuroscience News Updates: Low-intensity ultrasound can change decision making process in the brain (2019)
ReliaWire: Counterfactual thinking causally related to the anterior cingulate cortex (2019)
Medical Research News and Interviews: Pulse Ultrasound to the Brain could be Used to Affect Decision Making (2019)
PSI-COMM newsletter, How do we learn? Insights from the brain (2017) video available at: https://www.elsafouragnan.com/news
BBSRC, bbsrc.tumblr.com/post, Mapping the consequences of our decisions in the brain

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TEACHING & SUPERVISION

PostDoctoral SUPERVISION

Dr. Siti Yaakub, University of Plymouth, UK, 2022 – Present

PhD SUPERVISION

Nomiki Koutsoumpari, PhD in Neuroscience, University of Plymouth, UK, 2022 – Present
Tomithy Palmer, PhD in Neuroscience, University of Plymouth, UK, 2021 – Present
Kenza Kadri, PhD in Psychology, University of Plymouth, UK, 2020 – Present

Mica Komarnyckyj, PhD in Psychology, University of Huddersfield, UK, 2018 – Present (viva planned for October 2022)
Rory Baxter, PhD in Psychology, University of Plymouth, UK, 2018 – Viva 2022
Eleonora Parrotta, PhD in Psychology, University of Plymouth, UK, 2018 – Viva 2022

EXAMINER

Nicholar Clairis, PhD at the Sorbonne University, Paris, France, 2018 – Viva passed in 2022
Paul Knytl, PhD at the University of Surrey, School of Psychology, UK, 2018 - Viva passed in 2021
Elodie Levy, PhD at the Sorbonne University, Science and Engineering, Paris, France, 2020 - Present

LECTURING

Each course includes lectures and workshops/tutorials. In the methodological courses, I teach on a range of topics, including brain analyses and connectivity, model-based fMRI analyses, Bayesian model comparison and behavioural models of reinforcement learning

MA in Human Neuroscience (three modules) – *Physics of Neuroimaging (module leader) – Fundamental in spatial and temporal neural signals –fMRI tools and analyses*, Plymouth, 2020 – Present
MA in Psychology (two modules) – *Issues in Cognitive and Brain Science – The neural basis of decisions*, Plymouth, 2018 – Present
UG in Psychology (two modules) – *From Neurons to Behaviours – Introduction to cognitive neuroscience*, Plymouth, 2018 – Present
UNIQ (summer school) - *Dopamine and Learning,* University of Oxford, Summer 2017
MA in Cognitive Sciences - *Reinforcement Learning and Value-Based Decision,* Trento, Italy, 2012
Operating Centre, Central Air Navigation Systems, *Cognitive Properties of Human Factors and Error Models in Engineering,* Bordeaux, France, June 2007
MA in Psychotherapy - *Mental Imagery, Neurobiology, Stress,* Institute of Hydrotherapy, France, 2006
UG Sports Management - *Mental Imagery for Cognitive Science*, Bordeaux, France, 2005

TUTORING

Dissertation Project, University of Plymouth, 2018 - present
Saint Peter College, University of Oxford, Hilary term 2018
Sarah Lawrence Programme, Wadham College, University of Oxford, Michaelmas Term 2017
UNIQ summer school, University of Oxford, July 2017
Critical review, University of Glasgow, first semester 2015, 2016
Dissertation Project, University of Glasgow, second semester 2015, 2016

PROFESSIONAL SERVICE

Head of the Stimulation laboratory, University of Plymouth, Plymouth, 2018 – Present
Board member of the Change Group, Wellcome Centre for Integrative Neuroscience, Oxford, 2017-2018
Ad hoc reviewer: **Grants:** BBSRC, MRC, Wellcome Trust; **Journals:** Nature Communication, Nature Human Behavior, Scientific Report, Neuron, Brain Stimulation, Iscience, Frontiers, IEEE

REFERENCES

Prof. Stephen Hall, Director of BRIC, University of Plymouth
Brain research Imaging Center, Plymouth PL, UK
Phone: (0044) 175 258 - 4819 Email: stephen.hall@plymouth.ac.uk

Prof. Giorgio Ganis, School of Psychology, University of Plymouth
Portland Square, Plymouth PL, UK
Phone: (0044) 175 258 - 4812 Email: giorgio.ganis@plymouth.ac.uk

Prof. Matthew Rushworth, Experimental Psychology, University of Oxford
South Park Road, Oxford OX13UD, UK
Phone: (0044) 186 527 - 1444 Email: matthew.rushworth@psy.ox.ac.uk

Prof. Sebastien Bouret, Brain and Spine Institute, Paris
47 bd de l'hopital, Paris 75013, France
Phone: (0033) 15 727 - 4000 Email: sebastien.bouret@icm-institute.org

Prof. Marios Philiastides, Institute for Psychology and Neuroscience, University of Glasgow
R610, Level 6, 58 Hillhead Street, G128QB, Glasgow, UK
Phone: (0044) 141 330 - 4774 Email: marios.philiastides@glasgow.ac.uk

Prof. Giorgio Coricelli, Department of Economics, University of Southern California
KAP 306A, 3620 South Vermont Avenue, LA, CA 90089-0253, USA
Phone: (001) 213 740 - 2432 Email: giorgio.coricelli@usc.edu