Rasa **GULBINAITE**

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Marie-Curie Fellow, post-doctoral researcher

Data and analysis methods savvy researcher investigating interaction between non-invasive rhythmic sensory stimulation and intrinsic brain rhythms, with the aim to understand brain rhythm generation and modulation.

Main electrophysiological tools: M/EEG in humans, wide-field optical imaging and electrophysiological high-density laminar recordings in mice. Statistical and analysis methods: linear mixed effect models, time-frequency power and phase synchronization, cross-frequency coupling, multivariate source separation.

SCIENTIFIC POSITIONS

2021 Jan -

Netherlands Institute for Neuroscience

Amsterdam, The Netherlands

Marie-Curie Fellow, Post-doctoral researcher | group of Dr. A. Heimel

Project: Understanding neurophysiological effects of flicker on the brain activity across multiple spatial scales (from neurons, local field potentials across cortical layers to EEG) using high-density neural recordings (Neuropixels) and optogenetic manipulation of genetically targeted neuronal subpopulations.

2018 Sep – 2020 Dec

Centre de Recherche en Neurosciences de Lyon

Lyon, France

Post-doctoral researcher | group of Dr. M. Bonnefond

Project: High special precision MEG recordings in humans using individual 3D-printed head-casts minimizing head movement and allowing to measure laminar activity in humans. Using flicker as means for validation of non-invasive estimates of layer-specific activity and means to track covert spatial attention.

2018 Mar – 2018 Jun

Canadian Center for Behavioural Neuroscience

Lethbridge, Canada

Visiting scientist | group of Prof. M. Mohajerani

Project: Understanding the spatial dimension of flicker resonance phenomena using optical imaging of genetically encoded glutamate and calcium indicators in mice. During 4-month visit I learned optical imaging techniques, and was able to perform experiments. I also initiated and was actively involved in 2P calcium imaging project to obtain population-level responses to flicker.

2014 Oct – 2017 Dec

Centre de Recherche Cerveau & Cognition

Toulouse, France

Post-doctoral researcher | group of Dr. R. VanRullen

Project: Interaction between and rhythmic sensory stimulation (visual and tactile) and intrinsic brain rhythms combining psychophysics, modelling, and EEG experiments. I initiated and moderated biweekly meeting on M/EEG and LFP analysis methods.

2014 Mar – 2014 Jun

Donders Institute for Brain, Cognition and Behaviour

Nijmegen, The Netherlands

Internship | group of Dr. M. Havenith & P. Tiesinga

Duties: data analyses of laminar recordings in mouse primary visual cortex and hippocampus, as well as assistance in the lab work.

2009 Dec – 2014 Oct

University of Groningen

Groningen, The Netherlands

PhD in Experimental Psychology | supervised by Dr. H. van Rijn and A. Johnson

Thesis: Variations in working memory capacity: From cognition to brain networks. Using EEG as a primary tool this work provided neural evidence for the relationship between individual differences in working memory capacity and attentional control.

PUBLICATIONS

Citations: 610 | h-index: 11

Publications under review

- **Gulbinaite R.**, Nazari M., Bermudez-Contreras E., Heimel A,, Cohen M.X, Mohajerani M.H.. *Spatiotemporal resonance patterns in the mouse primary visual cortex.* bioRxiv: tinyurl.com/3m8xr66m
- Mora Cortes A., **Gulbinaite R.**, Ridderinkhof R., Cohen M.X. *Using the SSVEP to measure the SNARC-spatial attention effects in a parity judgment task.* bioRxiv: tinyurl.com/48t5ztsw
- Lassalle A., Cohen MX, Dekkers L., Milne E., **Gulbinaite R.**, Geurts H. (2020) *Behavioural and EEG atypicalities during rest, visual perception, and cognitive control in autistic adults.* PsyArXiv: https://psyarxiv.com/42zrq/

Peer reviewed

- Chota, S., VanRullen, R., **Gulbinaite R.**, (2023). *Random tactile noise stimulation reveals beta-rhythmic impulse response function of the somatosensory system.* Journal of Neuroscience, 43 (17), 3107-3119
- Adam N., Blaye A., Gulbinaite R., Chabé-Ferret,S., Farrer C. (2022). *A multidimensional evaluation of the benefits of an ecologically realistic training based on pretend play for preschoolers' cognitive control and self-regulation.* Journal of Experimental Child Psychology 216, 105348.
- Adam N., Blaye A., **Gulbinaite R.,** Delorme A., Farrer C. (2020). *The role of midfrontal theta oscillations across the development of cognitive control in preschoolers and school-age children.* Developmental Science, e12936.
- Duprez D., **Gulbinaite R.,** Cohen M.X (2020). *Midfrontal theta phase coordinates behaviorally relevant brain computations during response conflict.* NeuroImage: 207:116340.
- **Gulbinaite R.**, Roozendaal D. H. M. & VanRullen R. (2019). *Attention differentially modulates the amplitude of resonance frequencies in the visual cortex.* NeuroImage, 203:116146.
- **Gulbinaite R.**, van Viegen T., Wieling M., Cohen M.X, VanRullen R. (2017). *Individual alpha peak frequency predicts 10 Hz flicker effects on selective attention.* Journal of Neuroscience 37(42):10173-10184.
- **Gulbinaite R.**, Ilhan B., VanRullen R. (2017). *The triple-flash illusion reveals a driving role of alpha-band reverberations in visual perception.* Journal of Neuroscience 37(30): 7219-7230.
- Vissers M., **Gulbinaite R.**, van den Bos T., Slagter H.A. (2017). *Protecting visual short-term memory during maintenance: Attentional modulation of target and distractor representations.* Scientific Reports 7(1): 4061.
- Cohen M.X, **Gulbinaite R.** (2017). *Rhythmic entrainment source separation: Optimizing analyses of neural responses to rhythmic sensory stimulation.* NeuroImage 147: 43-56.
- **Gulbinaite R.**, Van Rijn H., Cohen M.X. (2014). *Fronto-parietal network oscillations reveal relationship between working memory capacity and cognitive control.* Frontiers in Human Neuroscience 8:761.
- **Gulbinaite R.**, Johnson A., De Jong R., Morey C.C., Van Rijn H. (2014) *Dissociable mechanisms underlying individual differences in visual working memory capacity.* NeuroImage 99(1), 197-206.
- Cohen M.X, **Gulbinaite R.** (2013). *Five methodological challenges in cognitive electrophysiology.* NeuroImage 85(2), 702–710.
- **Gulbinaite R.**, Johnson A. (2013). *Working memory capacity predicts conflict-task performance.* Quarterly Journal of Experimental Psychology 67(7), 1383-1400.

Book chapters

- Johnson, A., **Gulbinaite, R.** (2012). *Performance Monitoring and Error-related Brain Activity.* In Neuroergonomics: A Cognitive Neuroscience Approach to Human Factors and Ergonomics. Palgrave Macmillan London

TEACHING and SUPERVISION

2023
Ernst Strüngmann Institute Frankfurt, DE

Workshop Instructor "Multivariate source separation"
Role: 2h workshop in Cutting Gardens'23. M/EEG methods conference.

2021
Leiden University Medical Center, NL

Scientific Review Supervisor | Master's student Loan Tran
Project title: "The role of neural oscillations in shaping visual perception: evidence from periodic visual stimulation".

2018
Université Claude Bernard Lyon 1, FR

Co-lecturer "Introduction to Neural Oscillations" course
Role: Master's level course involving lectures, paper discussions, and exam grading.

2018
Paris, FR

Workshop Instructor "Separating different alpha sources"
Role: 2h workshop in Cutting EEG'18. M/EEG methods conference.

2017-2019
Paul Sabatier University, Toulouse, FR

Co-supervisor of PhD thesis | PhD student Nicolas Adam
Role: Supervising EEG data analyses of two large-scale (N= 85) experiments. Thesis title: "The role of midfrontal theta oscillations across the development of cognitive control in preschoolers and school-age children."

2016-2018
Aeronautical and Space Center ISAE Supaéro Toulouse, FR

Co-Lecturer "Neuroergonomics" course
Role: Lectures on Attention taught as part of "Neuroergonomics" course for Master's level students.

2016 May
Arizona State University Tempe, USA

Teaching assistant for "Time-frequency analysis methods" course
Role: Teaching assistant and guest lecturer at an intense three-day "Time-frequency analysis methods" course taught by Dr. Michael X Cohen.

2016 Jan - Aug
University of Amsterdam, Amsterdam, NL

Supervisor of Master's thesis | Master's student Diane H. Roozendaal
Role: Daily supervisor of the second-year Master's project, which the student completed at CerCo (Toulouse, FR). Project title: "The Effects of Attention on SSVEPs in response to 3 – 80 Hz flicker". Help with the application for Erasmus funding to obtain additional financial support.

2015 Mar
University of Amsterdam, Amsterdam, NL

Guest lecturer for "Cognitive Electrophysiology Methods"
Role: Guest lecture for Master's level course taught by Dr. Michael X Cohen.

2014 - 2017
University of Amsterdam, Amsterdam, NL

Co-supervisor of PhD thesis | PhD student Marlies Vissers
Role: Experiment design and programming of two experiments, co-writing the papers.

2014 - 2017
University of Amsterdam, Amsterdam, NL

Co-supervisor of PhD thesis | PhD student Anderson Mora
Role: Designed an experiment, which was one of the empirical chapters in the PhD thesis.

2014 Oct – 2015 Aug
University of Amsterdam, Amsterdam, NL

Co-supervisor of Master's thesis | Master's student Tara van Viegen
Role: Co-supervisor of the second-year Master's project focusing on the effects of subject specific alpha (~10 Hz) flicker on attention.

2013 Mar - Jun
University of Groningen, NL

Bachelor student thesis advisor | 5 students
Role: Co-supervision of empirical study, I helped to program the task, analyze, and interpret the data, and gave advice on the relevant literature.

SYMPOSIA, TALKS, POSTERS

2023, Sep — *Resonance phenomena at macro- and mesoscale of neural activity.* Donders Centre for Neuroscience, Nijmegen, NL

Invited speaker

2023, Mar — *Resonance phenomena at macro- and mesoscale of neural activity.* Institut de Neurosciences de la Timone, Marseille, FR

Invited speaker

2022, Sep — *Spatial dimension of steady-state visual evoked potentials in mouse V1.* European Visual Cortex Meeting. Munich, Germany. Poster

2022, Aug — *Stroboscopic light effects on perceptual and cognitive experiences.* 8th Visual Science of Art Conference (VSAC). Amsterdam, The Netherlands

Symposium organizer & speaker

2022, May — *Spatial dimension of steady-state visual evoked potentials in mouse V1.* XIII International Conference on Cognitive Neuroscience (ICON), Helsinki, Finland

Poster

2021, Nov — *Spatial dimension of steady-state visual evoked potentials in mouse V1..* Society for Neuroscience annual conference (SfN), Online.

Poster

2021, Jun — *Resonance frequencies in the visual cortex and illusory perception.* Society for Mathematical Biology Annual Conference. Online presentation.

Invited speaker

2019, Aug — *Unwritten history of flicker: neuroscience, arts, mathematics, and medicine.* 7th Visual Science of Art Conference (VSAC). Leuven, Belgium

Symposium moderator and speaker

2019, Jun — *Won't take no as an answer: non-dichotomous multiple choice.* Career Day 2019 Perspectives for Women in Life Sciences. Leibniz Institute for Neurobiology, Magdeburg, Germany

Invited speaker

2019, Jun — *Strobe light effects on the visual brain of mice and men.* Leibniz Institute for Neurobiology, Magdeburg, Germany

Invited speaker

2018, Nov — *Strobe light effects on the visual brain: From neurons to neural networks.* 10th Conference of Lithuanian Neuroscience Association (LNA) and 2nd International Symposium on Visual Physiology, Environment and Perception (VisPEP). 30 Nov – 1 Dec, Vilnius, Lithuania

Invited speaker

2018, Jan — *Understanding perception and attention through repetitive light stimulation.* ICM (Brain & Spine Institute), Paris, France

Invited talk

2017, Dec — *Understanding perception and attention through repetitive light stimulation.* NeuroSpin, Cognitive Neuroimaging Unit, Paris, France

Invited talk

2017, Aug — *Can we measure without influencing the measured: Rhythmic sensory stimulation in brain research.* XII International Conference on Cognitive Neuroscience (ICON), Amsterdam, The Netherlands

Symposium chair & speaker

2017, Jun — *Attention effects on steady-state visual evoked potentials in response to 3-80 Hz flicker.* M/EEG methods conference CuttingEEG. Glasgow, UK

Poster

2017, **May** *Attention effects on steady-state visual evoked potentials in response to 3-80 Hz flicker.* Vision Science Society annual meeting, St. Pete Beach, US

Poster

2016, **Dec** *Something out of nothing: The role of alpha-frequency reverberation in the triple-flash illusion*. Experimental Psychology Department, Groningen, The Netherland

Invited talk

2016, **Oct** *Signal or noise: Individual differences in alpha peak frequency.* BioMag'16, Seoul, Korea

Symposium chair & speaker

2016, **May** *Something out of nothing: The role of alpha-frequency reverberation in the triple-flash illusion*. Vision Science Society annual meeting, St. Pete Beach, US

Talk

2016, **May** *Many facets of rhythmic light stimulation.* Oscillatory Brain Dynamics conference. Arizona State University, US

Invited talk

2016, **Mar** *Signal or noise: Individual differences in alpha peak frequency*. Aeronautical and Space Center ISAE Supaéro, Toulouse, France

Invited talk

2016, **Feb** *Something out of nothing: The role of alpha-frequency reverberation in the triple-flash illusion.* Neuroscience Workshop Sacley, France

Poster

2015, **Oct** *Neural signatures of triple-flash illusion.* M/EEG methods conference CuttingEEG, Berlin, Germany

Poster (awarded with a prize)

2015, **Sep** *Individual alpha frequency predicts effects of flicker on spatial attention.* Entrainment of Brain Oscillations (EBO), Delmenhorst, Germany.

Poster

2015, **May** *Steady-state visual evoked potentials: 200 years of research.* Psychology Department, University of Arizona, Tucson

Invited colloquium

2014, **Sep** *Neural mechanisms underlying the relationship between working memory capacity and cognitive control abilities*. 7th European Working Memory Symposium (EWOMS), Edinburgh, UK

Talk

2013, **Nov** *Variations in working memory capacity: Suppression of distractors of enhancement of the targets?* Society for Neuroscience annual conference (SfN), San Diego, US

Poster

2013, **Sep** *Variations in working memory capacity: Suppression of distractors of enhancement of the targets?* 53rd Annual Meeting of the Society for Psychophysiological Research Society. Psychophysiology. 50, S1, p. S63-S63 1 p. S63-S63 1 p.

Poster

2013, **May** *The role of parietal cortex in conflict processing: A combined tDCS-EEG study.* Dutch Neuroscience Meeting, Lunteren, The Netherlands

Talk

2013, **Jan** *The role of working memory capacity in cognitive control: A steady-state evoked potential study.* Alpine Brain Imaging Meeting, Champery, Stwitzerland

Poster

2011, **Sep** *Influence of task structure on proactive recruitment of cognitive control.* XI International Conference on Cognitive Neuroscience (ICON), Mallorca, Spain

Poster

Ad-hoc REVIEWER

See Publons for review statistics: https://publons.com/author/1214198/

PNAS; eLife; Current Biology; Journal of Neuroscience; NeuroImage; Psychophysiology; European Journal of Neuroscience; Frontiers in Human Neuroscience; PLoS One; Neuropsychologia

AWARDS

2020 Dec – 2022 Dec Marie Curie Individual Fellowship. https://cordis.europa.eu/project/id/843379
Project title: Illuminating neural microcircuitry underlying flicker resonance in the visual cortex

2015 Oct Poster Award at the M/EEG methods conference CuttingEEG (Berlin, Germany)

2007 Jun Travel award for York CVR Vision Science Summer School (Toronto, Canada)

EDUCATION

2009 Dec – 2014 May PhD in Experimental Psychology at the University of Groningen, The Netherlands (public defense and degree awarded on the 11th Sep, 2014)

2007 Sep – 2009 Jun M.Sc. in Neurobiology at the Vilnius University, Lithuania

2003 Sep – 2007 Jun B.Sc. in Biophysics at the Vilnius University, Lithuania

NON-SCIENTIFIC POSITIONS

2022 Sep – Scientific program coordinator at "Art of Neuroscience" (aon.nin.nl) annual competition and seminar

2021 Mar – Internal Confident at the Netherlands Institute for Neuroscience

2012 Dec – 2013 Dec Administrator at Groningen Graduate Interest Network (GRIN)
University of Groningen, The Netherlands

2007 Sep – 2009 Dec Project manager and data analyst at Quantitative research department,
TNS Gallup, International market research company
Vilnius, Lithuania

RESEARCH COMPETENCES & SKILLS

- Programming and Data analysis: Matlab, R. beginner Python
- Data acquisition: Spike GLX, pClamp, BioSemi (EEG), Eyelink 1000
- Neuroimaging data analyses tools: EEGLab, Fieldtrip, Chronux
- Neuroimaging data analyses techniques: time-frequency analyses, cross-frequency coupling, graph theory, source reconstruction, spatiotemporal filters (e.g. independent and principal component analyses, generalized eigenvalue decomposition)
- Adobe Photoshop, Illustrator, Lightroom

LANGUAGES

- Lithuanian: mother tongue
- English: proficient user (C2)
- Russian: proficient user (C2)
- French: proficient user (C1)
- Dutch: basic user (A2)