

# Curriculum Vitae

## MICHAEL PEREIRA, PHD

Rue du Petit Beaulieu 1  
1004 Lausanne  
Date of birth: 15. May 1985  
Nationality: Swiss  
(T) +41 79 409 97 46  
(E) michael.pereira@univ-grenoble-alpes.fr  
H-index: 9

(Google scholar): <https://scholar.google.ch/citations?user=9jeaDlGAAAAJ>  
(ResearchGate): [https://www.researchgate.net/profile/Michael\\_Pereira3](https://www.researchgate.net/profile/Michael_Pereira3)  
(Twitter): <https://twitter.com/meaperei>  
(GitLab): <https://gitlab.com/michael.pereira>  
(Personal website): <https://mpereira.netlify.com>

## Employment

5/2021 – now **SNSF Postdoc fellowship at CNRS, FR**  
Studying perceptual consciousness with scalp and intracranial EEG in the group of Dr. Nathan Faivre, funded by the Swiss National Science Foundation (SNSF; <http://p3.snf.ch/project-199251>).

11/2019 – 4/2021 **SNSF Early Postdoc fellowship at CNRS, FR/ West Virginia University, US**  
Studying perceptual consciousness with DBS ON/OFF (CHU Grenoble, FR; Pr. Mircea Polosan) and DBS intraoperative single neuron recordings (WVU, US; Prof. Ali Rezai) in the group of Dr. Nathan Faivre, funded by the Swiss National Science Foundation (SNSF; <http://p3.snf.ch/project-187974>).

3/2018 – 10/2019 **Post-doc on DBS and consciousness at EPFL, CH/ West Virginia University, US**  
DBS and perceptual consciousness. Coordinating DBS intraoperative recordings to study the neural correlates of perceptual consciousness and sensory attenuation in the laboratory of Pr. Olaf Blanke.

11/2012-01/2018 **PhD in Brain-computer interfaces at EPFL, CH**  
Studying action monitoring in continuous motor tasks in the laboratory of Prof. José del R. Millán. Thesis defended on the 2. February 2018.

4/2010-4/2012 **Research engineer at Sony Deutschland GmbH, DE**  
Machine learning and signal processing for speech and music. Supervisor: Dr. Thomas Kemp.

9/2009-2/2010 **Master thesis at Sony Deutschland GmbH, DE**  
Speech enhancement for GSM communication. Supervisor: Dr. Franck Giron

8/2008-1/2009 **Internship at Sony Deutschland GmbH, DE**  
Speech enhancement for GSM communication. Supervisor: Dr. Franck Giron

2000 – 2009 **Co-funder, Busimex, CH**  
Website design and server maintenance

## Education

11/2012-12/2017 **Doctoral studies at EPFL, CH**  
Supervisor: Prof. José del R. Millán

9/2007 – 3/2010 **Master in Communication Systems, EPFL, CH**  
Focus on signal processing and cryptography (GPA: 5.33/6.00)

10/2003 – 2/2007 **Bachelor in Communication Systems, EPFL, CH**

## Grants and awards:

2021 Best oral presentation award at ASSC'21

2020 Swiss National Science Foundation (SNSF) *PostDoc.Mobility* fellowship (64'000 €)

2019 Swiss National Science Foundation (SNSF) *Early PostDoc.Mobility* fellowship (65'000 €)

2019 Best poster award at ASSC'19

2018 Travel fellowship from the Swiss Society for Neuroscience (1'400 €)

## Student supervision

Formal co-supervision Ramla Msheik, François Stockart (PhD students)

Informal supervision Audrey Gaspard, Giedre Stripeikyte, Christoph Schneider (PhD students), Mi Xue Tan, Camille Varescon, Audrey Gaspard, Ramla Msheik, Arnaud Devaschez, Ruslan Ardyarkhanov, Frédéric Giraud, Yoorah Ju Rah, Alberto Viseras Ruiz (Master theses), Anastasia Bouzdine, Léa Vidal, Damien Jones, Marie Duc (internships).

## Teaching activities

Teaching intervention	<i>Masterclass</i> for Master students (Université Grenoble-Alpes, France, 5 hours; fall 2021)
Teaching intervention	<i>UE Psychophysique</i> for Master students (Université Grenoble-Alpes, France, 3 hours; fall 2021)
Teaching intervention	<i>Perceptual consciousness and metacognition</i> for PhD students (Jagiellonian university in Kraków, Poland, 6 hours; spring 2021)
Teaching intervention	<i>Question actuelles de la recherche en psychologie cognitive</i> for 1 <sup>st</sup> year students (Université Grenoble-Alpes, France, 4 hours ; spring 2021)
Teaching intervention	<i>Human movement Science</i> for Masters students (Université Grenoble-Alpes, France, 3 hours; spring 2021)
Teaching assistant	<i>Data analysis</i> for Master students (EPFL, Switzerland, 2015 fall and 2014 fall)
Teaching assistant	<i>Brain-computer interfaces</i> for Master students (EPFL, Switzerland, 2015 spring and 2014 spring)

## Reviewing activities (<https://publons.com/researcher/1279621/>)

2022	National Science Centre, Poland (1), IEEE Transactions on Biomedical Engineering (1).
2021	National Science Centre, Poland (1), Nature Communications (1), PLoS Biology (2), NeuroImage (1), Gigascience (2), Journal of Neural Engineering (3), Brain-Computer Interfaces (3), Frontiers in Human Neuroscience (3).
2020	NeuroImage (1), Scientific Reports (2), Brain Topography (1).
2019	Brain-Computer Interfaces (2), IEEE Transactions on Biomedical Engineering (1), IEEE International Conference on Systems, Man, and Cybernetics (1).
2018	IEEE International Conference on Systems, Man, and Cybernetics (1).
2017	Journal of Neural engineering (3), Brain-Computer Interfaces (3), Frontiers in Human Neuroscience (2).
2016	IEEE International Conference on Systems, Man, and Cybernetics (2).

## Personal skills

Neuroscience:	Decision-making, perceptual consciousness, metacognition, motor control.
DBS:	Intraoperative single neuron recordings, local-field potentials, EEG with DBS ON/OFF.
Closed-loop / BCI:	Real-time neural signal acquisition, closed-loop decoding of neural signals, electrical stimulation artifact reduction on neural signals, basic control theory.
Neuroimaging:	EEG, ECoG/iEEG, LFP, SUA, fMRI (incl. simultaneous EEG-fMRI), tACS (incl. simultaneous EEG-tACS).
Technical:	Data analysis, machine learning, signal processing, computational modeling, basic electronics, speech and music processing, programming in MATLAB, Stan, R, Python and C (incl. fixed-point).
Languages:	French (native speaker), English (C2 TOEFL, fluent), Spanish (good command), German (B2 certification, good command).

## Main ongoing projects

### Unravelling the computational mechanisms underlying conscious perception

Funded by a Swiss National Science Foundation (SNSF) *PostDoc Mobility* fellowship. I investigate whether perceptual consciousness and metacognition relies on a process of evidence accumulation, using computational modeling and EEG, as well as intracranial EEG and single neurons recorded in the brain of patients undergoing invasive epilepsy monitoring at the Centre Hospitalier Universitaire (CHU) of Grenoble (Pr. Philippe Kahane). Scientific advisor: Dr. Nathan Faivre

### Using deep brain stimulation to dig out the subcortical correlates of consciousness

Funded by a Swiss National Science Foundation (SNSF) *Early PostDoc Mobility* fellowship (<http://p3.snf.ch/project-187974>). I study the contribution of subcortical structures to perceptual consciousness and metacognition using intraoperative single neuron recordings at the Rockefeller Neuroscience Institute (Pr. Ali Rezaei), as well as post-operative LFP recordings and EEG while DBS is on or off at the CHU Grenoble (Pr. Mircea Polosan). I link behavioral and neural data to computational models of evidence accumulation and intend to use this mechanistic understanding to better understand (meta)cognitive deficits in patients with obsessive-compulsive disorder. Scientific advisor: Dr. Nathan Faivre.

## Selected scientific publications

- Journal paper **Pereira, M.**, Perrin, D., Faivre, N., A leaky evidence accumulation process for perceptual experience. *Trends in Cognitive Sciences* (2022).
- Journal paper **Pereira, M.**, Mégevand, P., Tan, M. X., Chang, W., Wang, S., Rezai, A., Seeck, M., Corniola, M., Momjian, S., Bernasconi, F., Blanke, O., Faivre, N., Evidence accumulation relates to perceptual consciousness and monitoring. *Nature Communications* **12**:1-11 (2021) <https://www.nature.com/articles/s41467-021-23540-y.pdf>  
*I developed the study, performed all analyzes (single neuron activity, EEG decoding, computational modeling) and drafted the paper.*
- Journal paper **Pereira, M.\***, Faivre, N.\*, Iturrate, I.\*, Wirthlin, M., Serafini, L., Martin, S., Desvachez, A., Blanke, O., Van De Ville, D., Millán, J. del R., Disentangling the origins of confidence in speeded perceptual judgments through multimodal imaging. *Proceedings of the National Academy of Science*. **117**(15):8382-8390 (2020) (\* Equal contribution). <https://www.pnas.org/content/pnas/117/15/8382.full>  
*I developed the study, recorded data, performed all analyzes except for the behavior (EEG decoding, fMRI analysis, EEG-fMRI fusion, computational modeling) and drafted the paper.*
- Journal paper Iturrate, I.\*, **Pereira, M.\***, Millán, J. del R., Closed-loop electrical neurostimulation: Challenges and opportunities. *Current Opinion in Biomedical Engineering* **8**:28-37 (2018). (\* Equal contribution)  
<https://mpereira.netlify.app/publication/iturratepereira2018/iturrate2018.pdf>  
*I wrote the opinion article with II and performed the analyses.*
- Journal paper **Pereira, M.**, Sobolewski, A. and Millán, J. del R. Action monitoring cortical activity coupled to sub-movements. *ENeuro* **4**:1-12 (2017).  
<http://www.eneuro.org/content/4/5/ENEURO.0241-17.2017>  
*I developed the study, recorded all data, performed all analyzes and drafted the paper.*

## Other scientific publications

- In prep. **Pereira, M.\***, Faivre, N.\*, Bernasconi, F.\*, Brandmeir, N., Suffridge, J., Wang, S., Finomore, V., Rezai, A., Blanke, O. Single neuron correlates of tactile awareness in the human subthalamic nucleus. (\* Equal contribution).
- In prep. **Pereira, M.**, Varescon, C., Bouzdine, A., Faivre, N., Blanke, O., Bernasconi, F., Sensory attenuation during tactile detection.
- Under review **Pereira, M.**, Skiba, R., Cojan, Y., Vuilleumier, P., & Begue, I. (2021). *Optimal confidence for unaware visuomotor deviations* [Preprint]. *Biorxiv*.  
<https://doi.org/10.1101/2021.10.22.465492>
- Journal paper Stripeikyte, G., **Pereira, M.**, Rognini, G., Potheegadoo, J., Blanke, O., Faivre, N., Increased functional connectivity of the intraparietal sulcus underlies the attenuation of numerosity estimations for self-generated words. *Journal of Neuroscience* **41**(43):8917-8927 (2021) <https://www.jneurosci.org/content/jneuro/41/43/8917.full.pdf>
- Journal paper Rouy, M., Saliou, P., Nalborczyk, L., **Pereira, M.**, Roux, P., Faivre, N., Systematic review and meta-analysis of the calibration of confidence judgments in individuals with schizophrenia spectrum disorders. *Neuroscience and Biobehavioral Reviews* **126**:329-337 (2021).
- Journal paper Rahnev, D., Desender, K., Lee, A.L.F., ..., **Pereira, M.**, et al., The confidence database. *Nature Human Behavior* **4**:317-325 (2020)  
<https://mpereira.netlify.app/publication/rahnev2020/rahnev2020.pdf>
- Journal paper Faivre, N\*, Roger, M\*, **Pereira, M.**, de Gardelle, V., Vergnaud, J.C., Passerieux, C., Roux, P., Confidence in visual motion discrimination is preserved in individuals with schizophrenia. *Journal of Psychiatry and Neuroscience* **46**:E65-73 (2020)  
<https://doi.org/10.1101/2019.12.15.19014969>
- Journal paper Schneider, C., **Pereira, M.**, Tonin, L., Millán, J. del R. Real-time EEG Feedback on Alpha Power Lateralization Leads to Behavioral Improvements in a Covert Attention Task. *Brain Topography* **33**:48-59 (2019).  
<https://mpereira.netlify.app/publication/schneider2019/schneider2019.pdf>
- Journal paper Corbet, T., Iturrate, I., **Pereira, M.**, Perdakis, S., Millán, J. del R. Sensory threshold neuromuscular electrical stimulation fosters motor imagery performance. *Neuroimage* **276**:268-276 (2018).  
<https://mpereira.netlify.app/publication/corbet2018/Corbet2018.pdf>
- Journal paper Iturrate, I., Chavarriaga, R., **Pereira, M.**, Zhang, H., Corbet, T., Leeb, R., Millán J. del R. Dissociable neural imprints of hand grasping types from EEG. *Neuroimage* **181**:635-644 (2018).  
<https://mpereira.netlify.app/publication/iturrate2018/iturrate2018.pdf>

Journal paper	<b>Pereira, M.*</b> , Argelaguet, F. *, Millán, J. del R., Lécuyer, A., Novice shooters with lower pre-shooting alpha power have better performance during competition in a virtual reality scenario. <i>Frontiers in Psychology</i> . <b>9</b> :1-5 (2018). * Equal contribution <a href="https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00527/full">https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00527/full</a>
Conference proc.	Pereira, M., Sobolewski, A., Millán, J. del R. Modulation of the inter-hemispheric asymmetry of motor-related brain activity using brain-computer interfaces. Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Milano, IT (2015).
Invited talk	<i>Subcortical neuronal correlates of consciousness</i> (Association for the Scientific Study of Consciousness (ASSC) meeting 21; online; June. 2021 – best oral presentation award).
Invited talk	<i>Evidence accumulation determines conscious access</i> (Neuromatch 3.0; online; Nov. 2020).
Invited talk	<i>Subthalamic nucleus activity reflects first and second-order conscious reports</i> (European Winter Conference on Brain Research (EWCBR), Villars-sur-Ollon, CH, March 2020).
Invited talk	<i>Subthalamic nucleus activity reflects first and second-order conscious reports</i> (Alpine brain imaging meeting (ABIM), Champéry, CH; 2020; <20% oral presentation selection).
Invited talk	<i>Electrophysiological and hemodynamic correlates of self-committed and observed decision monitoring</i> (Alpine brain imaging meeting (ABIM), Champéry, CH; 2018; <20% oral presentation selection).
Invited talk	<i>Modulation of the inter-hemispheric asymmetry of motor-related brain activity using brain-computer interfaces</i> (IEEE Engineering in Medicine and Biology Conference (EMBC), Milano, IT; 2015).
Invited seminar	<i>Computational mechanisms for consciousness and monitoring</i> (Max Planck Institute, Leipzig, DE (online); Apr. 2022).
Invited seminar	<i>Evidence accumulation and perceptual consciousness / monitoring</i> (Bar Ilan University, Tel Aviv, IL (online); Nov. 2021).
Invited seminar	<i>A LEAP* for perceptual experience</i> (Séminaire sur la conscience, Université Grenoble-Alpes, FR; Sep. 2021).
Invited seminar	<i>Computational mechanisms of perceptual consciousness and confidence</i> (Grenoble Institute of Neuroscience, Grenoble, FR; June 2021).
Invited seminar	<i>Evidence accumulation determines conscious access</i> (Humboldt-Universität zu Berlin, DE (online); June 2021).
Invited seminar	<i>Evidence accumulation determines conscious access</i> (University College Dublin, IR (online); Aug. 2020).
Invited seminar	<i>Research overview</i> (Cinatec, CEA, Grenoble, FR; July 2020).
Invited seminar	<i>Neural correlates of error-detection and metacognition</i> (West Virginia University, Morgantown, US; May 2019).
Invited seminar	<i>Electrophysiological and hemodynamic correlates in committed and observed decisions</i> (Center for Neuroprosthetics Symposium, EPFL, Geneva, CH; Nov. 2018). One of six studies selected from eight labs for oral presentation at the annual symposium).
Poster presentation	<i>Parietal neurons accumulate evidence leading to perceptual awareness</i> (Workshop on Intracranial Recordings in humans: Epilepsy, DBS (WIRED), Paris, FR; Nov. 2019).
Poster presentation	<i>Electrophysiological correlates of tactile awareness and associated confidence</i> (Association for the Scientific Study of Consciousness (ASSC) meeting, London, CA; June 2019; best poster award).
Poster presentation	<i>Disentangling the origins of confidence in speeded perceptual judgments through multimodal imaging</i> (Swiss Society for Neuroscience (SSN) Meeting, Geneva, CH; Feb. 2019).
Poster presentation	<i>Electrophysiological and hemodynamical correlates of self-committed and observed decisions</i> (Society for Neuroscience (SfN) Meeting, San Diego, US; Nov. 2018).
Poster presentation	<i>Performance-driven modulation of beta cortical oscillations during sustained visuo-motor tracking</i> (Society for Neuroscience Meeting (SfN), Washington, US; Nov. 2017).
Poster presentation	<i>Theta phase coupling with rhythmic motor output during visuomotor tracking</i> (BCI Meeting, Asilomar, US; Oct. 2016).
Poster presentation	<i>Electrophysiological correlates of attention for motor rehabilitation</i> (NeuroRehab, Maastricht, NL; May 2015).

## Major ongoing collaborations

Prof. Robert T. Knight (UC Berkeley, USA) – Action monitoring during continuous movements  
Prof. Simon Kelly (University College Dublin, Ireland) – Computational modelling of stimulus detection  
Prof. Ali Rezaei (Rockefeller Neuroscience Institute, USA) – Intraoperative recordings  
Dr. Shuo Wang (Washington University in St. Louis, USA) – Single neuron recordings  
Dr. Pierre Mégevand (University Hospitals Geneva, Switzerland) – Single neuron recordings  
Prof. Philippe Kahane (Centre Hospitalier Universitaire de Grenoble, France) – Intracranial recordings  
Prof. Milan Brazdil (St. Anne's University Hospital in Brno, Czech Republic) – Intracranial recordings  
Prof. Mircea Polosan (Centre Hospitalier Universitaire de Grenoble, France) – Obsessive-compulsive disorder  
Dr. Indrit Bègue (University Hospitals Geneva, Switzerland) – Schizophrenia