Dr. Sylvain Chevallier

Curriculum Vitæ

42 years, French
Full Professor, LISN, University Paris-Saclay
Webpage: https://sylvchev.github.io/
Scholar profile: https://scholar.google.com/citations?user=j5Tu_SQAAAAJ

Professional experience

2022-today	Full professor, Univ. Paris-Saclay, LISN-CNRS
2011-2022	Associate professor, Univ. Paris-Saclay, LISV - UVSQ, Vélizy
2011	Postdoctoral researcher, Télécom ParisTech, Paris Machine learning for brain-computer interfaces
2010	Postdoctoral researcher, INRIA, TAU team, Saclay Collective and emergent decision-making process
2008-2010	Lecturer, Univ. Cergy-Pontoise, ETIS-Biocybernetic team, Cergy Attentional bias during man-robot interaction

Education

2019	Habilitation à Diriger des Recherches in Computer Science, Univ. Paris-Saclay, Vélizy *Contributions to geometrical and machine learning approaches, from brain signal to cognitive activities*
2009	PhD in Computer Science, Univ. Paris-Sud, Orsay *Bioinspired neural network for visual attention in mobile robots*
2005	M2 in Computer Science, specialty in Cognitive Sciences, Univ. Paris-Sud, Orsay

Research topics

- Brain-Computer Interfaces
- Machine Learning and Optimization
- Riemannian Geometry for Time Series
- Anomaly detection

Awards and Distinctions

2020	Winner of task 1, Clinical BCI Challenge - IEEE WCCI
2018-2019	1-year research leave, granted by the national academic committee (acceptance rate < 10%)
2016-today	National research and doctoral training prize (acceptance rate < 20%)

Selected Scientific Projects

Co-PI, 2022-2025	DATAIA, YARN: robust estimators and transfer learning for EEG, 400k€
Co-PI, 2019-2021	MAIF Foundation, EllisCar, EEG sleep detection in driving condition, 150 k€
PI, 2019-2021	Industrial project, OpenMind Innovation, Benchmarking open hardware BCI device, 50 k€
PI, 2018-2021	Industrial project, Nexeya-Hensoldt, Anomaly detection for time series, 1 PhD funding, 200 k€
Co-PI, 2016-2017	IDEX funding, Nuerofeedback for trouble in facial recognition, 1 postdoc funding, 75 k€
PI, 2012-2014	EADS Foundation, Hybrid brain-computer interfaces, 1 postdoc funding, 100 k€

PhD Supervision

2020-2023	Maria Yamamoto, ANR UDOPIA grant, "Similarity-based Classification with Riemannian methods for high-dimensional EEG", co-supervised with F. Lotte (Inria Bordeaux)
2020-2023	Isabelle Hoxa, Gouvernement grant, "Neurocognitive mechanisms of anticipatory perception in decision-making", co-supervised with MA. Amorim (Univ. Paris-Saclay) and A. Delorme (SCCN, UCSD)
2018-2021	Amina Alaoui-Belghiti, Industrial grant with Nexeya-Hensoldt "Predictive maintenance with anomaly detection based on optimal transport"
2017-2021	Jinan Charafeddine, Lebanese grant, "Controlling lower limb exoskeleton with EMG for locomotor activities", co-supervised with D. Pradon (R. Poincare hospital) and S. Alfayad (Univ. Evry)
2014-2017	Emmanuel Kalunga, South African grant, "Toward User-Adapted Brain-Computer Interfaces : Robust Interactions and Machine Learning based on Riemannian Geometry" co-supervised with E. Monacelli (Univ. Versailles)
2013-2016	Hugo Martin, industrial grant, Bouygues Construction, "Building Information Modeling: Visualization of Massive Data" co-supervised with E. Monacelli (Univ. Versailles)

Scientific Responsibilities and Visibility

Open Source Projects

- Mother of All BCI Benchmarks (MOABB), lead maintainer, benchmarks of BCI algorithms on open datasets
- PyRiemann, lead maintainer, Riemannian machine learning pipelines for BCI
- Multivariate Dictionary Learning Algorithm (MDLA), lead developer, dictionary learning for BCI
- PyManOpt, contributor, optimization on smooth manifold

Workshops Organization

- "Riemannian Geometry Methods for EEG preprocessing, analysis and classification", BCI meeting, 2021
- "Open-source Python tools for BCIs", BCI Thursdays, 2021
- "Benchmarking BCI classification methods: a hands-on introduction", Graz BCI conference, 2019

Selected Invited Talks

- "Transfer learning for BCI: how to learn invariant representation", BCI workshop, invited talk, INRIA Bordeaux, 2020
- "Riemannian Brain-Computer Interface - from invariances to transfer learning", Paris-Brain Institute, Aramis INRIA, invited seminar, 2020
- "Embedding invariances for Riemannian Brain-Computer Interfaces", INRIA/CEA Parietal, invited seminar, 2020
- "Challenges in Brain-Computer Interfaces : Insights from a Riemannian point of view", Encuentro Cientifico Internacional, Paris, invited talk, 2019

- " Riemannian Brain-Computer Interface From invariance to transfer learning", Tokyo University of Agriculture and Technology, Japan, invited talk, 2019
- "Robust Riemannian brain-computer interfaces", University Mohammad 1st, Morocco, invited talk, 2017
- "Riemannian geometry applied to EEG-based cerebral interfaces : Challenges and opportunities ", invited talk, UCLouvain, Belgium, 2016
- "Assessment of rehabilitation in virtual environment ", University College London, invited talk, 2015

Art-Science Installations

- "Kodama", "J'ai tant reve de toi" and "Cantabile", co-designed with M. Passedouet, exposed in Versailles and Boston.

Conference Program Committee Member

- NeurIPS, AISTATS, ICLR, ICML, ACML, ESANN and IROS

Member of Editorial Boards of Scientific Journals

- Frontiers in Brain-Computer Interfaces
- Frontiers in Applied Mathematics and Statistics

Publications

All these publications are available on HAL :
https://cv.archives-ouvertes.fr/sylvain-chevallier
and on Google Scholar:
https://scholar.google.fr/citations?user=j5Tu_SQAAAAJ

Selected publications

[1] Xiaoxi Wei, A Aldo Faisal, Moritz Grosse-Wentrup, Alexandre Gramfort, **Sylvain Chevallier**, et al. 2021 BEETL Competition: Advancing Transfer Learning for Subject Independence & Heterogenous EEG Data Sets. JMLR, 2022. [Artificial Intelligence, **Q1**]

[2] Marie-Constance Corsi, **Sylvain Chevallier**, Fabrizio de Vico Fallani, Florian Yger. Functional connectivity ensemble method to enhance BCI performance (FUCONE). IEEE TBME, 2022. [Biomedical Engineering, **Q1**]

[3] **Sylvain Chevallier**, Emmanuel Kalunga, Quentin Barthélemy, Eric Monacelli. Review of Riemannian distances and divergences, applied to SSVEP-based BCI. *Neuroinformatics*, 19(1), 93-106. 2021 [Computer Science Applications, Biomedical Engineering, **Q1**]

[4] Florian Yger, **Sylvain Chevallier**, Quentin Barthélemy, Suvrit Sra. Geodesically-convex optimization for averaging partially observed covariance matrices. In *Asian Conference on Machine Learning*, 2020, **[A1, Qualis]**

[5] Amina Alaoui-Belghiti, **Sylvain Chevallier**, Eric Monacelli, Guillaume Bao, Eric Azabou. Semi-supervised optimal transport methods for detecting anomalies. In *ICASSP*, Barcelone, Espagne, 2020. **[A1, Qualis]**