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Curriculum vitae

PERSONAL INFORMATION

Tiziana Cattai

WORK EXPERIENCE

April 2021– September 2021

Post-doctoral researcher

INSERM, Paris, France

Project under the supervision of Mario Chavez in collaboration with IBM France

November 2017– April 2021

PhD candidate

Aramis Lab, Paris, France

PhD project under the joint supervision of Fabrizio De Vico Fallani (Sorbonne University) and Stefania Colonnese (La Sapienza University)

May 2018–April 2021

Visiting research student

ICT Lab in Department of Information Engineering, Electronics and Telecommunications (DIET) at University La Sapienza of Rome

Regular visiting student (almost 4 months per year)

March-May 2019

Teaching assistant

PolyTech Sorbonne, Paris, France

Teaching in C practical classes (30 hours)

March 2017-September 2017

Internship

Aramis Lab, Paris, France

Internship for master thesis in signal processing

EDUCATION AND TRAINING

November 2017–April 2021

PhD

Thesis Title: "Leveraging brain connectivity networks to detect mental states during motor imagery tasks"

Aramis Lab, Brain and Spine Institute, Inria, CNRS, Sorbonne University, Paris, France in collaboration with ICT lab,Department of Information Engineering, Electronics and Telecommunications, University La Sapienza of Rome.

October 2015–October 2017

Master degree

University La Sapienza of Rome, Italy

Biomedical Engineering, 110/110 cum laude. Thesis title: "Study of coherence changes during motor imagery tasks".

October 2012–October 2015 Bachelor degree

University La Sapienza of Rome, Italy

Clinical Engineering, 110/110 cum laude.

RESEARCH PROJECTS

Network connectivity estimators to discriminate motor imagery and resting state
- Inclusion of different connectivity and graph features for motor imagery-based BCI task.
- Testing discriminatory ability of these features with statistical analysis and classifications

Robust network topology detection using graph signal processing tools
- Graph filtering to capture brain connectivity in real EEG data
- Development of a framework for feature extraction and classification analysis in the context of graph connectivity detection

Low rank representations of noisy data
- Analysis of a layered version of L1-PCA, identified as Deep L1-PCA
- Application to EEG connectivity data to verify its ability of identifying outliers, changes, and stable components

RESPONSIBILITY OF INTERNATIONAL PROJECTS

- Project for joint PhD thesis supported by "Université Franco-Italienne". Title of the project:"Exploiter le réseau de connectivité du cerveau pour détecter les états mentaux pendant l'imagerie motrice". 2019
- Project titled 'Time-varying connectivity estimation for online Brain-Computer Interface' "Bando di Avvio alla Ricerca". 2018

PERSONAL SKILLS

Mother tongue Italian

Other languages

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English
C1	C1	B2	C1	B2
French
C1	C1	C1	C1	B2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Computer skills
- experience with Python, Matlab and C
- competent with Git, as well as writing tools as Latex

Other skills I am scout leader, involved in many humanitarian initiatives. I am passionate about technological innovation for social good and for climate change. I love hiking and climbing.

Driving licence B

PUBBLICATIONS

[1] **Tiziana Cattai**, Gaetano Scarano, Marie-Constance Corsi, Danielle S Bassett, Fabrizio De Vico Fallani, and Stefania Colonnese. "Improving J-divergence of brain connectivity states by graph Laplacian denoising". In: *IEEE Transactions on Signal and Information Processing over Networks* 7 (2021), pp. 493–508.

[2] **Tiziana Cattai**, Stefania Colonnese, Marie-Constance Corsi, Danielle S Bassett, Gaetano Scarano, and Fabrizio De Vico Fallani. "Phase/amplitude synchronization of brain signals during motor imagery BCI tasks". In: *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 29 (2021), pp. 1168–1177.

[3] Juliana Gonzalez-Astudillo, **Tiziana Cattai**, Giulia Bassignana, Marie-Constance Corsi, and Fabrizio De Vico Fallani. "Network-based brain computer interfaces: principles and applications". In: *Journal of Neural Engineering* (2020).

[4] Manon Ansart, Stéphane Epelbaum, Giulia Bassignana, Alexandre Bône, Simona Bottani, **Tiziana Cattai**, Raphael Couronne, Johann Faouzi, Igor Koval, Maxime Louis, et al. "Predicting the Progression of Mild Cognitive Impairment Using Machine Learning: A Systematic, Quantitative and Critical Review". In: *Medical Image Analysis* (2020), p. 101848.

[5] Stefania Colonnese, Paolo Di Lorenzo, **Tiziana Cattai**, Gaetano Scarano, and Fabrizio De Vico Fallani. "A Joint Markov Model for Communities, Connectivity and Signals Defined Over Graphs". In: *IEEE Signal Processing Letters* 27 (2020), pp. 1160–1164.

[6] Stefania Colonnese, Mauro Biagi, **Tiziana Cattai**, Roberto Cusani, Fabrizio De Vico Fallani, and Gaetano Scarano. "Green compressive sampling reconstruction in IoT networks". In: *Sensors* 18.8 (2018), p. 2735.

[7] Giovanna Orrú, **Tiziana Cattai**, Stefania Colonnese, Gaetano Scarano, Fabrizio De Vico Fallani, Panos Markopoulos, and Dimitris Pados. "Deep L1-PCA of Time-Variant Data with Application to Brain Connectivity Measurements". In: *2019 27th European Signal Processing Conference (EUSIPCO)*. IEEE. 2019, pp. 1–5.

[8] **Tiziana Cattai**, Stefania Colonnese, Marie-Constance Corsi, Danielle S Bassett, Gaetano Scarano, and Fabrizio de Vico Fallani. "Combination of connectivity and spectral Features for motor-imagery BCI." In: *GBCIC*. 2019.

[9] **Tiziana Cattai**, Stefania Colonnese, Marie-Constance Corsi, Danielle S Bassett, Gaetano Scarano, and Fabrizio De Vico Fallani. "Characterization of mental states through node connectivity between brain signals". In: *2018 26th European Signal Processing Conference (EUSIPCO)*. IEEE. 2018, pp. 1377–1381.

OTHER INFORMATION

Conferences
- Poster presentation at CuttingEEG 2018, Paris
- Conference speaker at EUSIPCO (European signal processing conference) 2018, Rome
- Conference speaker at EUSIPCO (European signal processing conference) 2019, A Coruna
- Poster presentation at OHBM (Organization of human brain mapping) 2019, Rome
- Poster presentation at GRAZ BCI Conference, 2019, Graz
- Conference attendee at OHBM (Organization of human brain mapping), 2020, online

Workshops
- Speaker and poster presentation at workshop Journées CORTICO, 2019, Lille
- Speaker at Graph Signal Processing Workshop, 2019, Paris

Reviewer for international journals
- IEEE Transactions on Neural Systems & Rehabilitation Engineering
- PLOS ONE
- Chemosphere
- Brain multiphysics