SIMONE MAURIZIO LA CAVA

Postdoctoral Researcher

CONTACTS

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EDUCATION

Bachelor's Degree in Biomedical Engineering
University of Cagliari (Italy), 02/2019
110/110 cum laude
Thesis: Spectral and connectivity analysis and classification of the EEG signal in focal and generalized epileptic seizures
Supervisor: Matteo Fraschini

Master's Degree in Computer Engineering, Cybersecurity and Artificial Intelligence
University of Cagliari (Italy), 09/2021
110/110 cum laude
Thesis: Effects of tasks and brain disorders on EEG-based biometrics: an investigation on Parkinson's disease and major depressive disorder
Supervisor: Luca Didaci

Ph.D. in Electronic and Computer Engineering
University of Cagliari (Italy), 02/2025
Thesis: 3D Facial Reconstruction and Deepfake Detection: Advances in Security and Forensic Investigation Through Complementary Deep Learning Techniques
Supervisor: Gian Luca Marcialis

RESEARCH ACTIVITY

Postdoctoral Research in Computer Engineering
University of Cagliari (Italy), 10/2024-Now
Main topics: Explainable deepfake and morphing detection
Supervisor: Gian Luca Marcialis

Research Grant
University of Cagliari (Italy), 2019-2021
Topics: M/EEG analysis for clinical and biometric applications
Supervisor: Matteo Fraschini

Program Committees

- 2025 IEEE International Joint Conference on Biometrics (IJCB)
- T-CAP: Towards a Complete Analysis of People: Fine-Grained Understanding for Real-World Applications (Workshop at ECCV 2024)
- IMFBS: Innovations in Multimedia Forensics And Biometric Security (Workshop at ACM SAC 2025)

Participation in projects

- PRIN2017 project "BullyBuster - A framework for bullying and cyberbullying action detection by computer vision and artificial intelligence methods and algorithms" (CUP: F74I19000370001), Italian Ministry of Education, University and Research (MIUR)
- PRIN 2022 PNRR - "BullyBuster 2 – the ongoing fight against bullying and cyberbullying with the help of artificial intelligence for the human wellbeing" (CUP: P2022K39K8), European Union – Next Generation EU
- "SEcurity and RIghts in the CyberSpace (SERICS)" (PE00000014), Italian Ministry of University and Research (MUR) National Recovery and Resilience Plan funded by the European Union – Next Generation EU

RESEARCH TOPICS & PUBLICATIONS

- **Analysis and synthesis of 2D and 3D facial biometrics for authentication and forgery detection in security and forensic applications**

La Cava, S. M., Concas, S., Tolosana, R., Casula, R., Orrù, G., Drahansky, M., ... & Marcialis, G. L. (2024). Exploring 3D Face Reconstruction and Fusion Methods for Face Verification: A Case-Study in Video Surveillance. In 18th European Conference on Computer Vision ECCV 2024 Workshops.

Concas, S., La Cava, S. M., Casula, R., Orrù, G., Puglisi, G., & Marcialis, G. L. (2024). Quality-based Artifact Modeling for Facial Deepfake Detection in Videos. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition.

Panzino, A., La Cava, S. M., Orrù, G., & Marcialis, G. L. (2024). Evaluating the Integration of Morph Attack Detection in Automated Face Recognition Systems. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition.

PROFESSIONAL EXPERIENCE

Teaching tutoring: Elements of Computer Science
Bachelor's degree course in Electrical, Electronic, and Computer Engineering
University of Cagliari (Italy)
A.Y. 2019/2020
40 hours

Teaching tutoring: Fundamentals of Computer Science
Bachelor's degree courses in Chemical Engineering and Mechanical Engineering
University of Cagliari (Italy)
A.Y. 2021/2022 and A.Y. 2022/2023
40 hours

Teaching tutoring: Elements of Computer Science
Bachelor's degree course in Biomedical Engineering
University of Cagliari (Italy)
A.Y. 2024/2025
15 hours

Teaching: Elaboration of Images
Bachelor's degree course in Radiology techniques medical imaging and radiotherapy
University of Cagliari (Italy)
A.Y. 2024/2025
40 hours

LANGUAGES

Italian
Native language

English B2 First – 06/2019
Cambridge Assessment English

Shahreza, H. O., Ecabert, C., George, A., Unnervik, A., ... & Fierrez, J. (2024). Sdfr: Synthetic data for face recognition competition. In 2024 IEEE 18th International Conference on Automatic Face and Gesture Recognition (FG).

La Cava, S. M., Orrù, G., Drahansky, M., Marcialis, G. L., & Roli, F. (2023). 3D Face Reconstruction: the Road to Forensics. ACM Computing Surveys.

La Cava, S. M., Orrù, G., Goldmann, T., Drahansky, M., & Marcialis, G. L. (2022). 3D Face Reconstruction for Forensic Recognition-A Survey. In 2022 26th International Conference on Pattern Recognition (ICPR).

Concas, S., La Cava, S. M., Orrù, G., Cuccu, C., ... & Roli, F. (2022). Analysis of Score-Level Fusion Rules for Deepfake Detection. Applied Sciences, 12(15).

- **Analysis and modeling of EEG and MEG signals for biomedical processing and biometric applications**

Fraschini, M., La Cava, S. M., Rodriguez, G., Vitale, A., & Demuru, M. (2022). Scorepochs: a computer-aided scoring tool for resting-state M/EEG epochs. *Sensors*, *22*(8).

Coa, R., La Cava, S. M., Baldazzi, G., Polizzi, L., ... & Puligheddu, M. (2022). Estimated EEG functional connectivity and aperiodic component induced by vagal nerve stimulation in patients with drug-resistant epilepsy. Frontiers in Neurology.

Demuru, M., La Cava, S. M., Pani, S. M., & Fraschini, M. (2020). A comparison between power spectral density and network metrics: an EEG study. *Biomedical Signal Processing and Control*, *57*.

Pani, S. M., Ciuffi, M., Demuru, M., La Cava, S. M., … & Fraschini, M. (2020). Subject, session and task effects on power, connectivity and network centrality: A source-based EEG study. *Biomedical Signal Processing and Control*, *59*.

Fraschini, M., La Cava, S. M., Didaci, L., & Barberini, L. (2020). On the variability of functional connectivity and network measures in source-reconstructed EEG time-series. *Entropy*, *23*(1).

- **Anomaly detection in crowded environment**

Orrù, G., Lecca, R., Puddu, R., La Cava S. M., Micheletto, M., & Marcialis, G. L. (2025). Data generation via diffusion models for crowd anomaly detection. In 35th British Machine Vision Conference 2024 (BMVC 2024) Workshops.

Orrù, G., Porcedda, E., La Cava, S. M., Casula, R., & Marcialis, G. L. (2023). Human-centered evaluation of anomalous events detection in crowded environments. In 22nd International Conference of the Biometrics Special Interest Group (BIOSIG 2023).

- **Fingerprint Liveness Detection**

Micheletto, M., Casula, R., Orrù, G., Carta, S., … & Marcialis, G. L. (2023). "LivDet2023 - Fingerprint Liveness Detection Competition: Advancing Generalization". IEEE 2023 International Joint Conference on Biometrics (IJCB).