

Alessio Fagioli

ASSISTANT PROFESSOR

Department of Law and Economics, *UnitelmaSapienza University*, Piazza Sassari 4, 00161, Rome, Italy

🏠 <https://www.unitelmasapienza.it>

Education

Sapienza University

Rome, Italy

PH.D. IN COMPUTER SCIENCE (WITH HONORS)

2019 - 2022

- Thesis Title: Towards Human-like Neural Networks: A Neuroscience Approach
- Advisors: Luigi Cinque, Danilo Avola

Sapienza University

Rome, Italy

MASTER DEGREE IN COMPUTER SCIENCE (CUM LAUDE)

2016 - 2019

- Thesis Title: Non-Acted Body Affect Recognition
- Advisors: Luigi Cinque, Danilo Avola

Sapienza University

Rome, Italy

BACHELOR DEGREE IN COMPUTER SCIENCE

2013 - 2016

- Thesis Title: Sviluppo di un Sistema per la Classificazione di Oggetti in Ambienti Esterni su Dispositivi Mobili
- Advisors: Luigi Cinque, Danilo Avola

Work Experience

UnitelmaSapienza University

Rome, Italy

ASSISTANT PROFESSOR

2023 - Present

- Design and development of deep learning architectures based on Neuroscience.

University of Udine

Udine, Italy

POSTDOCTORAL RESEARCH FELLOW

2022 - 2023

- Design and development of deep learning architectures addressing handwritten text recognition in historical manuscripts.

Sapienza University

Rome, Italy

PH.D. FELLOWSHIP

2019 - 2022

- Design and development of deep learning architectures addressing heterogeneous tasks, e.g., person re-id and medical image analysis.

Sapienza University

Roma, Italy

SOFTWARE ARCHITECT

2019-2020

- Design and development of medical image pre-processing algorithm.
- Implementation of a deep neural network for thyroid nodule classification.

Autostar Flaminia S.p.A.

Rome, Italy

SOFTWARE ARCHITECT

2012-2013

- Design and development of a management software based on JAVA and MySQL.
- Implementation of detailed metrics and visualization tools to track seller performances across the years.

Research Projects

SEARCHER - Smart unmannEd AeRial vehiCles for Human likE monitoRing.

Italian Ministry of Defence

PI: Professor Danilo Avola, Sapienza University of Rome.

WORK PACKAGE LEADER

2022 - 2023

- Coordination of the WP1 group
- Design and description of the project architecture
- Design and development of novel deep learning algorithms based on attention mechanism and neuroscience concepts

A Brain Computer Interface (BCI) based System for Transferring Human Emotions inside Unmanned Aerial Vehicles (UAVs).

Sapienza University

PI: Professor Danilo Avola, Sapienza University of Rome.

STAFF MEMBER

2022-2023

- Design and implementation of novel deep learning models for human emotion synthesis and extraction
- Collection of a human emotion dataset
- Design and evaluation of novel deep learning algorithms

SPECGEO - SPEctral GEOmetric methods in practice.

ERC Starting Grant no. 802554

PI: Professor Emanuele Rodolà, Sapienza University of Rome.

STAFF MEMBER

2019-2020

- Design and development of neural networks models for thyroid nodule classification
- Design and development of a multimodal feature fusion algorithm
- Lab testing of the proposed solution

RA2M - Augmented Reality for Mobile Applications.

Italian Ministry of Defence

PI: Professor Gian Luca Foresti, University of Udine.

STAFF MEMBER

2015-2016

- Design and development of algorithms for detection and classification of unexploded ordnance
- Collection of training dataset
- Lab testing of the proposed solution

Teaching Experience

Lecturer on Informatica per le Professioni Economiche

*Department of Law and Economics,
UnitelmaSapienza*

BACHELOR DEGREE IN SCIENZE DELL'AMMINISTRAZIONE E DELLA SICUREZZA

2023 - present

Lecturer on Strumenti per la Gestione e l'Innovazione Digitale d'Impresa

*Department of Law and Economics,
UnitelmaSapienza*

BACHELOR DEGREE IN SCIENZE DELL'ECONOMIA AZIENDALE

2023 - present

Laboratory teacher

*AI-DLDA: International Summer
School on Artificial Intelligence*

PH.D. SUMMER SCHOOL IN ARTIFICIAL INTELLIGENCE.

2023

Lecturer on Informatica e Tecnologie della Comunicazione Digitale

*Department of Communication and
Social Research, Sapienza*

I SEMESTER: BACHELOR DEGREE IN COMUNICAZIONE PUBBLICA E D'IMPRESA.

COURSE HELD BY PROFESSOR DANILO AVOLA.

2020 - 2023

Lecturer on Informatica e Tecnologie della Comunicazione Digitale

*Department of Communication and
Social Research, Sapienza*

II SEMESTER: BACHELOR DEGREE IN COMUNICAZIONE, TECNOLOGIA E CULTURE DIGITALI.

COURSE HELD BY PROFESSOR DANILO AVOLA.

2020 - 2023

Lecturer on Digital Content Processing

*Department of Management,
Sapienza*

I SEMESTER: MASTER DEGREE IN ECONOMIA E COMUNICAZIONE PER IL MANAGEMENT E L'INNOVAZIONE.

COURSE HELD BY PROFESSOR DANILO AVOLA.

2019 - 2023

Speaking Experiences

International Conference on Image Analysis and Processing Workshop

Udine, Italy

PRESENTER FOR <WRITER IDENTIFICATION IN HISTORICAL HANDWRITTEN DOCUMENTS: A LATIN DATASET AND A BENCHMARK>

2023

- Introduced a novel dataset for writer identification in historical documents.
- Introduced a benchmark of renowned models on several collections generated from the collected dataset.

STITCH Seminar

Rome, Italy

PRESENTER FOR <L'ESPERIENZA DI RICERCA INTERDISCIPLINARE DEL CENTRO STITCH>

2023

- Introduced the workflow behind the joint work of computer science and medicine behind the thyroid nodule classification task.
- Q&A of upcoming relevant topics in computer science for medicine applications.

Publications

Journals

- [1] Danilo Avola, Luigi Cinque, Maria De Marsico, Alessio Fagioli, Gian Luca Foresti, Maurizio Mancini, and Alessio Mecca. "Signal Enhancement and Efficient DTW-based Comparison for Wearable Gait Recognition". In: *Computers & Security* (2023), p. 103643.
- [2] Danilo Avola, Andrea Bacciu, Luigi Cinque, Alessio Fagioli, Marco Raoul Marini, and Riccardo Taiello. "Study on transfer learning capabilities for pneumonia classification in chest-x-rays images". In: *Computer Methods and Programs in Biomedicine* 221 (2022), p. 106833.
- [3] Danilo Avola, Irene Cannistraci, Marco Cascio, Luigi Cinque, Anxhelo Diko, Alessio Fagioli, Gian Luca Foresti, Romeo Lanzino, Maurizio Mancini, Alessio Mecca, and Daniele Pannone. "A Novel GAN-Based Anomaly Detection and Localization Method for Aerial Video Surveillance at Low Altitude". In: *Remote Sensing* 14.16 (2022), p. 4110.
- [4] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, and Gian Luca Foresti. "Affective Action and Interaction Recognition by Multi-View Representation Learning from Handcrafted Low-Level Skeleton Features." In: *International Journal of Neural Systems* (2022), pp. 2250040–2250040.
- [5] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, and Gian Luca Foresti. "Human silhouette and skeleton video synthesis through Wi-Fi signals". In: *International Journal of Neural Systems* 32.05 (2022), p. 2250015.
- [6] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Marco Raoul Marini, and Fabrizio Rossi. "Real-time deep learning method for automated detection and localization of structural defects in manufactured products". In: *Computers & Industrial Engineering* (2022), p. 108512.
- [7] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, and Chiara Petrioli. "Person re-identification through Wi-Fi extracted radio biometric signatures". In: *IEEE Transactions on Information Forensics and Security* 17 (2022), pp. 1145–1158.
- [8] Danilo Avola, Luigi Cinque, Alessio Fagioli, and Gian Luca Foresti. "SIRe-Networks: Convolutional neural networks architectural extension for information preservation via skip/residual connections and interlaced auto-encoders". In: *Neural Networks* 153 (2022), pp. 386–398.
- [9] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Adriano Fragomeni, and Daniele Pannone. "3D hand pose and shape estimation from RGB images for keypoint-based hand gesture recognition". In: *Pattern Recognition* 129 (2022), p. 108762.

- [10] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, and Cristiano Massaroni. “Deep temporal analysis for non-acted body affect recognition”. In: *IEEE Transactions on Affective Computing* 13.3 (2022), pp. 1366–1377.
- [11] Danilo Avola, Manoochehr Joodi Bigdello, Luigi Cinque, Alessio Fagioli, and Marco Raoul Marini. “R-SigNet: Reduced space writer-independent feature learning for offline writer-dependent signature verification”. In: *Pattern Recognition Letters* 150 (2021), pp. 189–196.
- [12] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, and Gian Luca Foresti. “LieToMe: An ensemble approach for deception detection from facial cues”. In: *International Journal of Neural Systems* 31.02 (2021), p. 2050068.
- [13] Danilo Avola, Luigi Cinque, Angelo Di Mambro, Anxhelo Diko, Alessio Fagioli, Gian Luca Foresti, Marco Raoul Marini, Alessio Mecca, and Daniele Pannone. “Low-altitude aerial video surveillance via one-class SVM anomaly detection from textural features in UAV images”. In: *Information* 13.1 (2021), p. 2.
- [14] Danilo Avola, Luigi Cinque, Anxhelo Diko, Alessio Fagioli, Gian Luca Foresti, Alessio Mecca, Daniele Pannone, and Claudio Piciarelli. “MS-Faster R-CNN: Multi-stream backbone for improved Faster R-CNN object detection and aerial tracking from UAV images”. In: *Remote Sensing* 13.9 (2021), p. 1670.
- [15] Danilo Avola, Luigi Cinque, Alessio Fagioli, Sebastiano Filetti, Giorgio Grani, and Emanuele Rodolà. “Multimodal feature fusion and knowledge-driven learning via experts consult for thyroid nodule classification”. In: *IEEE Transactions on Circuits and Systems for Video Technology* 32.5 (2021), pp. 2527–2534.
- [16] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Daniele Pannone, and Claudio Piciarelli. “Automatic estimation of optimal UAV flight parameters for real-time wide areas monitoring”. In: *Multimedia Tools and Applications* 80.16 (2021), pp. 25009–25031.
- [17] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gianluca Foresti, and Alessio Mecca. “Ultrasound medical imaging techniques: a survey”. In: *ACM Computing Surveys (CSUR)* 54.3 (2021), pp. 1–38.
- [18] Danilo Avola, Luigi Cinque, Maria De Marsico, Alessio Fagioli, and Gian Luca Foresti. “LieToMe: Preliminary study on hand gestures for deception detection via Fisher-LSTM”. In: *Pattern Recognition Letters* 138 (2020), pp. 455–461.
- [19] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Daniele Pannone, and Claudio Piciarelli. “Bodyprint—A meta-feature based LSTM hashing model for person re-identification”. In: *Sensors* 20.18 (2020), p. 5365.

Conferences

- [1] Danilo Avola, Luigi Cinque, Maria De Marsico, Angelo Di Mambro, Alessio Fagioli, Gian Luca Foresti, Romeo Lanzino, and Francesco Scarcello. “LieToMe: An LSTM-Based Method for Deception Detection by Hand Movements”. In: *International Conference on Image Analysis and Processing*. Springer. 2023, pp. 387–398.
- [2] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Marco Raoul Marini, and Daniele Pannone. “Analyzing EEG Data with Machine and Deep Learning: A Benchmark”. In: *International Conference on Image Analysis and Processing*. Springer. 2022, pp. 335–345.
- [3] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Marco Raoul Marini, Alessio Mecca, and Daniele Pannone. “Medicinal Boxes Recognition on a Deep Transfer Learning Augmented Reality Mobile Application”. In: *International Conference on Image Analysis and Processing*. Springer. 2022, pp. 489–499.
- [4] Danilo Avola, Marco Cascio, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, and Cristiano Massaroni. “Master and rookie networks for person re-identification”. In: *International Conference on Computer Analysis of Images and Patterns*. Springer. 2019, pp. 470–479.
- [5] Danilo Avola, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Cristiano Massaroni, and Daniele Pannone. “Feature-based SLAM algorithm for small scale UAV with nadir view”. In: *International Conference on Image Analysis and Processing*. Springer. 2019, pp. 457–467.