

Marco Cascio

ASSISTANT PROFESSOR - RESEARCHER

Summary

Starting from December 2022 I am an Assistant Professor at UnitelmaSapienza University (Rome), while also supporting the Department of Computer Science at the Sapienza University of Rome where I am a member of the Computer Vision Laboratory (VisionLab) since 2018. My research topics mainly focus on Computer Vision, Artificial Intelligence, Machine/Deep Learning, and Signal Processing.

Languages:

- Italian: Mother tongue
- English: Proficient

Education

Department of Computer Science

Sapienza University of Rome

PHD IN COMPUTER SCIENCE (WITH HONORS)

2018-2021

- Thesis Title: Person Re-ID through Radio Biometric Signatures, Human Silhouette and Skeleton Video Synthesis through Wi-Fi Signals
- Advisors: Luigi Cinque, Chiara Petrioli
- Co-advisor: Danilo Avola

Department of Computer Science

Sapienza University of Rome

MASTER DEGREE COMPUTER SCIENCE (CUM LAUDE)

2015-2018

- Thesis Title: Un Approccio Innovativo basato su Deep Learning per la Classificazione di Human Action
- Advisor: Luigi Cinque
- Co-advisor: Danilo Avola

Department of Computer Science

Università degli Studi di Messina

BACHELOR DEGREE COMPUTER SCIENCE

2009-2015

- Thesis Title: Algoritmi di Risoluzione di Anagrammi
- Advisor: Giacomo Fiumara

Experience

Department of Legal and Economic Sciences - Department of Computer Science

UnitelmaSapienza - Sapienza
University of Rome

ASSISTANT PROFESSOR, ACADEMIC DISCIPLINE INF/01 INFORMATICS

2022 - present

Department of Computer Science

Sapienza University of Rome

RESEARCH FELLOW, ACADEMIC DISCIPLINES INF/01 INFORMATICS - ING-INF/05, PROJECT TITLE: HUMAN SILHOUETTE VIDEO
SYNTHESIS FROM WI-FI SIGNALS

2022

Department of Computer Science

Sapienza University of Rome

RESEARCH FELLOW, ACADEMIC DISCIPLINES INF/01 INFORMATICS - ING-INF/05, PROJECT TITLE: DEVICE-FREE WI-FI HUMAN
DETECTION, LOCALIZATION, POSE ESTIMATION AND PERSON RE-IDENTIFICATION BASED ON CSI AND DEEP LEARNING
STRATEGIES

2021

Department of Computer Science

Sapienza University of Rome

RESEARCH FELLOW, ACADEMIC DISCIPLINES INF/01 INFORMATICS - ING-INF/05, PROJECT TITLE: DEVICE-FREE WI-FI HUMAN
DETECTION, LOCALIZATION, POSE ESTIMATION AND PERSON RE-IDENTIFICATION BASED ON CSI AND DEEP LEARNING
STRATEGIES

2020

Research Projects

SEARCHER - Smart unmannEd AeRial vehiCles for Human likE monitoRing

Ministry of Defense

WORK PACKAGE LEADER - SENIOR R&D ENGINEER

2022

- Coordination of the WP2 group
- Study and analysis of the state-of-the art on the anomaly detection, novelty detection, and attention mechanism algorithms
- Design and development of novel deep learning algorithms

PON SMARTOUR - Piattaforma per la promozione del turismo culturale attraverso l'impiego di tecnologie innovative

Miur

SENIOR R&D ENGINEER

2020

- Study and analysis of the state of the art on wireless sensing and monitoring technologies
- Design and implementation of a Wi-Fi Person Re-Identification algorithm
- Lab testing of the proposed solution

MEDUSA - Monitoring maritimE areas by a cooperative Distributed Unmanned System made of heterogeneous AssetsStato Maggiore della Marina
(MARISTAT)

SENIOR R&D ENGINEER

2018-2020

- Study and analysis of the state of the art on the underwater anomaly detection algorithms
- Design and implementation of novel computer vision algorithms for underwater anomaly detection
- Lab testing of the proposed solutions

TEAM - Tecnologie Emergenti per l'Archeologia Marina

Lazio Innova

SENIOR R&D ENGINEER

2014-2020

- Study and analysis of the state of the art on the underwater novelty/anomaly detection and localization algorithms
- Design and implementation of novel computer vision algorithms for underwater novelty/anomaly detection and localization
- Lab testing of the proposed solutions

RA2M

Ministry of Defense

SENIOR R&D ENGINEER

2016-2018

- Study and analysis of the state of the art on visual detection and classification algorithms
- Design and development of algorithms for detection and classification of unexploded devices
- Lab testing of the proposed solutions

Teaching Experience

Lecturer for Digital Content Processing (Course Language: English)

Department of Management

MASTER DEGREE IN ECONOMY AND COMMUNICATION FOR MANAGEMENT AND INNOVATION

2018-2021

Lecturer for Computer Science and Information TechnologyDepartment of Communication and
Social Research (CoRiS)

BACHELOR DEGREE IN PUBLIC AND CORPORATE COMMUNICATION

2020

Lecturer for Computer Science and Information TechnologyDepartment of Communication and
Social Research (CoRiS)

BACHELOR DEGREE IN COMMUNICATION, TECHNOLOGIES AND DIGITAL CULTURES

2020

Speaker Experience

Ital-IA

Conference

ORAL PRESENTATION OF PAPER "MACHINE LEARNING FOR REAL TIME ANALYSIS OF SOCIAL DATA FOR DISASTER MANAGEMEN"

2019

Other Experience

PhD Summer School

Udine, Italy

INTERNATIONAL SUMMER SCHOOL ON ARTIFICIAL INTELLIGENCE (AI-DLDA 2020)

2020

Society Memberships, Honors & Awards

2020 -
present

Member, IEEE Organization

2022

Award for innovation and technological impact, PNRM Project Title: "INFERENCE - wl-fi seNsing For pErson Re-idENTifiCation and human image synthEsis", Ministry of Defense

2022

Paper selected for Newsletter, in *IEEE Biometrics Council Newsletter*, Paper Title: "Person Re-Identification through Wi-Fi Extracted Radio Biometric Signatures"

2020

Scholarship for International Summer School on Artificial Intelligence, University of Udine

2019

Award for innovation and technological impact, PNRM Project Title: "VERIFY - deVice frEe peRson re-Identification sYstem", Ministry of Defense

2019

Research grant "Avvio alla Ricerca", Project Title: "Device-Free Wi-Fi Human Detection, Localization, Pose Estimation and Re-Identification based on CSI and Deep Learning strategies", Sapienza University of Rome

Program Committees and Editorial Boards

2022

Guest Editor, in *Remote Sensing Journal* (Quartile: Q1, h-index: 144, Impact Factor: 5.349), Special Issue "Unmanned Aerial Vehicles (UAV): New Solutions and Applications for Real-Life Tasks"

*Remote Sensing
Journal*

2022

Program Committee, in *International Conference on Military Communications and Information Systems*

Udine, Italy

Academic Professional Service

Serving as reviewer for the following journals:

- IEEE

- Transactions on Multimedia
- Transactions on Industrial Electronics

- Elsevier

- Pattern Recognition
- Signal Processing
- Journal of Visual Communication and Image Representation

- Springer

- Artificial Intelligence Review

- MDPI

- Remote Sensing
- Sensors

Skills

Programming: C/C++, Python, C#, Java, Matlab, Swift, HTML, SQL

Frameworks: OpenCV, Pytorch, Keras, Tensorflow, Caffe, Scikit-Learn, Numpy

IDE & Tools: Visual Studio, NetBeans, Eclipse, IntelliJ, Pycharm, Android Studio, Xcode

Operating Systems: Windows, Linux Ubuntu, macOS

Personal Statement

I am a Postdoctoral research fellow and a member of the Computer Vision Laboratory (VisionLab) at the Department of Computer Science, Sapienza University (Rome). My research interests lie in the fields of **Computer Vision**, **Artificial Intelligence**, and **Signal Processing**. Over the last years, I worked on several research projects for **wireless sensing** and **image/video content understanding** applications. For the former, thanks to the knowledge gathered on **Wi-Fi signals** through in-depth research activity, I opened up a new frontier for a wide range of surveillance applications. The main contribution is a new signal-based sensing modality for **Person Re-Identification** and **Video Synthesis** tasks, traditionally based on visual information, which gives a visual appearance to the information carried by radio signals. For the latter, I developed **Event Recognition** methods using **Machine/Deep Learning** strategies and **visual data**, including **UAV monitoring** and **human behavior understanding** applications. Among the others, current research interests include **machine/deep learning**, **scene and event understanding**, **pattern analysis**, **anomaly detection and localization**, **human-computer interaction**, **biometric analysis**, **medical image analysis**, **multimodal fusion models**, **robotics**, **object tracking**, and **surveillance systems**.

Publications

Journals

- [1] 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**, vol. 17, pp. 1145–1158, 2022 (Quartile: Q1, h-index: 140, Impact Factor: 7.231)
- [2] Danilo Avola, **Marco Cascio**, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, Marco Raoul Marini, Fabrizio Rossi. "Real-Time Deep Learning Method for Automated Detection and Localization of Structural Defects in Manufactured Products". In: **Computers & Industrial Engineering**, pp. 108512, 2022 (Quartile: Q1, h-index: 136, Impact Factor: 7.180, Peer review: Double-blind)
- [3] 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**, pp. 1–23, 2022 (Quartile: Q1, h-index: 67, Impact Factor: 6.325)
- [4] 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**, vol. 32, no. 05, p. 2250015, 2022 (Quartile: Q1, h-index: 67, Impact Factor: 6.325)
- [5] Danilo Avola, Irene Cannistraci, **Marco Cascio**, Luigi Cinque, Anxhelo Diko, Alessio Fagioli, Gian Luca Foresti, Romeo Lanzino, Maurizio Mancini, Alessio Mecca, Daniele Pannone. "A Novel GAN-Based Anomaly Detection and Localization Method for Aerial Video Surveillance at Low Altitude". In: **Remote Sensing**, vol. 14, no. 16, pp. 1–18, 2022 (Quartile: Q1, h-index: 144, Impact Factor: 5.349)
- [6] 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**, vol. 31, no.02, p. 2050068, 2021 (Quartile: Q1, h-index: 67, Impact Factor: 6.325)
- [7] Danilo Avola, **Marco Cascio**, Luigi Cinque, Gian Luca Foresti, and Daniele Pannone. "Machine Learning for Video Event Recognition". In: **Integrated Computer-Aided Engineering**, vol. 28, no. 03, pp. 309–332, 2021 (Quartile: Q1, h-index: 45, Impact Factor: 6.137)

- [8] Danilo Avola, **Marco Cascio**, Luigi Cinque, Gian Luca Foresti, Cristiano Massaroni, and Emanuele Rodolà. “2-D Skeleton-Based Action Recognition via Two-Branch Stacked LSTM-RNNs”. In: *IEEE Transactions on Multimedia*, vol. 22, no. 10, pp. 2481–2496, 2020 (Quartile: Q1, h-index: 135, Impact Factor: 8.182)

Conferences

- [9] 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: *Image Analysis and Processing (ICIAP)*, Springer International Publishing, pp. 335–345, 2022 (Peer review: Double-blind)
- [10] Danilo Avola, Marco Bernardi, **Marco Cascio**, Luigi Cinque, Gian Luca Foresti, and Cristiano Massaroni. “A New Descriptor for Keypoint-Based Background Modeling”. In: *Image Analysis and Processing (ICIAP)*, Springer International Publishing, pp. 15–25, 2019 (Peer review: Double-blind)
- [11] Danilo Avola, **Marco Cascio**, Luigi Cinque, Alessio Fagioli, Gian Luca Foresti, and Cristiano Massaroni. “Master and Rookie Networks for Person Re-identification”. In: *Computer Analysis of Images and Patterns (CAIP)*, Springer International Publishing, pp. 470–479, 2019
- [12] M. Vernier, **Marco Cascio**, Gian Luca Foresti, and M. Farinosi. “Machine Learning for Real-Time Analysis of Social Data for Disaster Management”. In: *Ital-IA 2019*, pp. 1–2, 2019 (White paper)