

# DR. ANTONIO DI MAIO

## Postdoctoral Researcher in Data-Driven Mobile Networked Systems

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## EXPERIENCE

### Lecturer: Seminar in Quantum Mobile Networks

#### University of Bern

 Feb 2023 - Jul 2023

 Bern, Switzerland

- I secured funding for setting up an international, inter-university, fully-online, seminar series at the interface between Quantum Communications and Mobile Networking, with more than 20 student participants.
- From scratch, I created an international consortium of 13 professors from 8 universities to be the seminar's advising committee, sparking collaborations among participants. ( [VIDEO](#))

### Postdoctoral Research Associate

#### University of Bern, Communications and Distributed Systems group

 Sep 2020 - present

 Bern, Switzerland

- Current Research:
  - Distributed Learning over Resource-Constrained and Mobile Networked Systems: Federated, Split, Gossip, Personalized, and Secure Learning
  - AI-based Admission and Placement for Network Slices and Functions
  - Secure Cooperative Inference for Position and Trajectory Prediction
  - Analytical and Data-driven Wireless Network Performance Modeling and Optimization: Physical, MAC, and Network Layers
  - Cooperative Radio-Map Reconstruction from PHY-layer Sampling
  - Entanglement Distribution Optimization in Mobile Quantum Networks
- TA for Bachelor courses: Operating Systems, Network Security, Computer Networks, and Seminars in Advanced Topics in Computer Networks (~70 students/semester)
- Wrote international project proposals
  - EU CHIST-ERA Call for Open & Re-usable Research Data & Software (2022) — "AI-based Privacy-preserving Regulation-compliant Dataset Publishing" (1.55M EUR)
- Wrote national project proposals
  - InnoSuisse (2023) and InnoCheque (2022) — "Modular Sensor-Fusion Indoor Positioning Framework for Personnel Performance Scoring"
  - SNF Sinergia (2021) — "Sustainable Local Touristic Development through Wireless and Social Networks Data Analysis" (894k CHF)
- Wrote internal project proposals
  - DigiK call (2022) — "Enhancing Users' Psychological Wellbeing through Reinforcement Learning" and "Distributed Machine Learning to Support User-Defined Privacy" (500k CHF)
  - StratA call (2021) — "Humans in Digital Transformation" (400k CHF)

### Lecturer of Decision Making

#### Middlesex University

 Feb 2018 – Aug 2018

 London, UK

- Managed, designed, taught, and graded the course. Content: Behavioral and mathematical models that shape decision processes.

## HIGHLIGHTS

### Awards

- Recognition of Outstanding Teaching Achievements for the Seminar "Quantum Mobile Networks", ranked in the top 11 courses at the University of Bern in the Spring Semester 2023.
- Best paper award runner-up at WoWMoM 2023.

### Editor, Reviewer, and TPC member

 230+ verified reviews for Conference and Journal articles (IEEE TVT, TSNM, TSNE, Elsevier). Editing 3 Journals. 20+ TPC memberships. 4+ Technical Sessions chaired

### Student Supervision

Scientific advisor for 7 PhD students in my current team. Supervised 5 Bachelor Theses, among which:

- "A Reinforcement-Learning-Based FANET Placement Strategy against Dynamic Jamming Attacks" (2024).
- "Throughput-and Cost-aware Node Relocation for MANET Resiliency Under Jamming Attacks" (2023).
- "On the Application of OpenFlow-based SDN in Wireless Vehicular Ad Hoc Networks" (2018)

### Science Communication

 Published 7 journal and 23 conference articles. Presented my research at 6 conferences. Given 8 Wireless Networking guest lectures (Luxembourg, Bern) and 1 keynote speech (UFPA, Brazil).

### Inter-University Doctoral Schools

I organized the

- BENEFRI Summer School
  - 2021, Leissigen, Switzerland
  - 2024, Brienz, Switzerland
- CUSO Winter School
  - 2024, Champéry, CH ( [VIDEO](#))

# EDUCATION

## Postdoctoral Research Associate

**University of Luxembourg**

Jul 2020 – Sep 2020

Belval, Luxembourg

## Ph.D. in Telecommunications and Computer Engineering at SnT - Interdisciplinary Centre for Security, Reliability, and Trust

Apr 2016 – Jun 2020

University of Luxembourg

- Objective: Applying Software-Defined Networking to improve the Quality of Service of inter-vehicular communications
- Studied the allocation of a throughput- and delay-optimal pareto front of possible multi-flows in a multi-hop mobile network via a non-linear optimization problem
- Created a graph-based, congestion-avoiding routing algorithm for V2V communications in Software-Defined Vehicular Networks (SDVN), which balances path length and congestion for multiple competing data flows
- Created a graph-based content dissemination mechanism for cooperative SDVN, improving user fairness and data throughput while reducing frame collisions over multiple wireless channels

## Visiting Student (Erasmus+)

**DFKI - German Research Centre for Artificial Intelligence**

Apr 2015 – Sep 2015

Saarbrücken, Germany

- Worked on my Master Thesis during my semester abroad at the Ubiquitous Media Technology Lab headed by Prof. A. Krüger

## Master of Engineering in Computer Science

**Final Grade: 110/110, Summa cum laude (GPA: 29.5/30)**

Nov 2013 – Feb 2016

Polytechnic of Bari, Italy

- Thesis in Human-Machine Interaction: "Design of an application for tracking a human target with a drone". First work in literature that studies target tracking without color information and in absence of visible light (VIDEO)
- **Valedictorian Scholarship:** Prize granted to the student with the highest GPA in the whole 2016 Master of Engineering cohort
- Google DevFest 2014 Hackathon Winner: "HealthWear - Detecting falls and abnormal health parameters through a smartwatch"

## B.Eng. in Automation and Computer Science

**Final Grade: 110/110, Summa cum laude (GPA: 28.7/30)**

Sep 2009 – Jul 2013

Polytechnic of Bari, Italy

- Thesis in Image Processing and Artificial Vision: "Design and implementation of an eye blink detection Android application". Used SVM/LBP Classifiers, Integral Projection Functions, and Hu Moments to detect eye blinks (VIDEO)

## Diploma of Computer Engineering Technician

**Final Grade: 100/100 Honors (Top 0.02% high school student)**

Sep 2005 – Jul 2009

Tech. Industrial Inst. of Andria, Italy

# RESEARCH AREAS

Mobile/Mesh/Ad Hoc Networks

MAC Design, Modeling, and Optimization

Throughput/Delay Modeling

Federated, Split, Gossip, Personalized Learning

Cooperative Localization

Large-Scale Monte-Carlo Simulations

# PROJECTS

**6G-CLOUD: Service-Oriented 6G Network Architecture for Distributed, Intelligent, and Sustainable Cloud-Native Communication Systems**

**EU HORIZON-JU-SNS**

Mar 2023

Bern, Switzerland

- 13 academic and industrial partners
- **Goal:** Focus on developing a native-AI 6G architecture for cloud-continuum and management operation framework

**Humans in Digital Transformation**

**Uni Bern Strategic Funds**

Apr 2023

Bern, Switzerland

- University of Bern
- **Goal:** Enhancing Users' Psychological Wellbeing through Reinforcement Learning and Protecting User Privacy through Distributed Machine Learning

**Emotion Detection by Smartphone Usage Data Processing**

**Swiss National Science Foundation (SNF)**

Apr 2021

Uni Bern, Switzerland

- **Goal:** Evaluating the user's quality of life by processing sensor data acquired by their smartphone and the user's interaction with their smartphone.

**CONTACT - Context and content aware communications for QoS support in VANETs**

**Fonds National de Recherche (FNR) & Swiss National Science Foundation (SNF)**

2016 - 2019

Luxembourg

- Uni Luxembourg, Uni Bern, HES-SO Valais
- Funded my Ph.D. studies
- **Goal:** Integrating Software-Defined Networking, Named Data Networking and Floating Content paradigms to enhance Quality of Service in vehicular networks