

# Dr Ioannis MAVROMATIS

Principal Research Engineer

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## Core Skills

- › Real-world testbeds: Design & deployment
- › Cloud-Native: Architectures, tools & application design
- › Large-scale trials: Prototyping, deployment & evaluation
- › Networking: OSI Layers 2-7 & wireless standards
- › Infrastructure: Automation, provisioning, management
- › Software: Life-cycle, engineering & development
- › Simulators: Link/system-level & build/test use-cases
- › 5G Systems, V2X Communications & IoT systems
- › R&D: Experience on both research & development
- › Bid Writing

## Professional Experience

### Industrial & R&D Positions

- 10/2021 - **Principal Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- › **GreenML** - Design and implement energy-efficient ML and FL solutions.
    - Power capping optimisation for MLOps deployments.
    - Quantisation optimisation for reduced power consumption.
  - › **SYNERGIA** - Design and implement a secure IoT Cloud-native platform.
    - Implement a federated identity and access management framework for IoT nodes.
    - Develop a Data Drift Detection Framework - Abnormal data, model and firmware Drift Detection.
  - › **UMBRELLA** - Ongoing support on the developed backend / infrastructure - features and software extensions.
    - Direct a team of engineers developing frontend/backend microservices.
    - Provide technical consultation for external partners - Participate in techno-commercial discussions.
  - › **BEACON-5G** - Implement an IoT API / application marketplace for a 5G-enabled Cloud-native platform.
    - Integration with the UMBRELLA platform and network.
  - › **U-CARE** - Design and implement an air quality monitoring solution for care homes.
  - › **Other** - Concept Drift detection and mitigation for large-scale Federated Learning environments.
- 08/2019 - **Honorary Research Associate**, *University of Bristol*, Bristol, UK.
- › Migrate AI-assisted Intelligent Transportation Solutions with Cloud-native and Mobile Edge Infrastructures.
- 10/2020 - **Senior Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- 10/2021
- › **UMBRELLA** - Directed a team of engineers developing frontend/backend microservices.
    - Further developed UMBRELLA's highly-available IoT Cloud-Native Backend platform.
    - Further developed the IoT testbed components (IoT node software, communication buses, etc.).
    - Implemented the software for various use-cases (street light monitoring, air quality sensing, etc.).
  - › **SYNERGIA** - Designed and implemented a secure IoT Cloud-native platform.
- 08/2019 - **Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- 09/2020
- › **UMBRELLA** - Architected and implemented a highly-available IoT Cloud-Native Backend platform.
    - Developed components of the IoT testbed infrastructure (networking, IoT node software).
  - › **CAVShield** - Led Work Package 2 - Presented findings to funding body and government representatives.
    - Architected a Cyber Secure Platform for Cooperative Intelligent Transportation Systems.
  - › **CYTHEMIS** - Improved/demonstrated an end-to-end Intrusion Prevention System.
- 10/2018 - **Research Associate**, *University of Bristol*, Bristol, UK.
- 08/2019
- › **NG-CDI** - Developed an open-source AI-assisted 5G simulator for C-ITSs (DRIVE framework).
  - › **FLOURISH** - Developed a Fog Computing platform for large-scale connected vehicles experimentation.
    - Implemented/deployed a prototyped ITS-G5 testbed. Involved in large vehicular trial campaigns.
    - Designed an active jammer - tested performance/disruptions on prototyped ITS-G5 testbed.

- 02/2016 - **Research Assistant**, *University of Bristol*, Bristol, UK.
- 09/2018
  - » **FLOURISH** - Deployed a large-scale ITS-G5 vehicular communications platform.
    - Conducted city-wide connected vehicle trials and analysed the experimental data.
    - Developed a parallelised (multi-core compatible) version of the OMNeT++ INET framework.
  - » **VENTURER** - “Virtual Driving Testbed” - developed an in-lab testbed for vehicular communications.
- 04-09/2012 **Network Research Assistant (intern)**, *University Carlos III of Madrid (UC3M)*, Madrid, Spain.
  - » **FLAVIA** - Energy Efficiency improvements for WLAN networks (focus on the IEEE 802.11b/g/n/u).
    - Modified IEEE 802.11b/g driver and firmware (within OpenWRT) for improved power consumption.

### Networking and IT Positions

- 05-08/2013 **IT and Network Support and Consultant**, “*Unifast*” *Kiriakoulis Georgios*, Thessaloniki, Greece.
- 07-10/2008
  - » Planned, provisioned and deployed IT and networking infrastructure solutions (wired/wireless) for local businesses.
  - » Consultation on Enterprise Resource Planning (ERP) systems.
  - » IT support on Windows- and Unix-based OSs.
- 07-08/2007 **IT and Network Support and Consultant**, *TITAN Cement*, Thessaloniki, Greece.
  - » Planned, provisioned and deployed IT and networking infrastructure solutions for industrial environments.
  - » Programmed/tested PLC and SCADA automation systems.
  - » IT support on Windows- and Unix-based OSs.

### Teaching Assistant / Lab Demonstrator

- 2014 - 2018 **Teaching Support Assistance**, *University of Bristol*, Bristol, UK.
  - » ~360 h of teaching in Programming- and Networking-related topics.

## Education

- 10/2014 - **PhD in Communications**, *Dept. of Electr. & Electron. Engineering, University of Bristol*, Bristol, UK.
- 10/2018
  - » **1st Year’s Research Group Project**: “Localisation Of Strayed Targets (LOST)” (taught phase).
  - » **PhD Title**: “5G Communication Framework for Smarter Autonomous Vehicles” (research phase).
- 09/2013 - **MSc in “Wireless Communications and Signal Processing”**, *Dept. of Electr. & Electron. Engineering, University of Bristol*, Bristol, UK, *Grade: 68% - Pass with Merit*.
- 09/2014
  - » **MSc Thesis**: “Propagation Modelling using Iterative Physical Optics”.
- 05/2007 - **BSc in “Information Technology Engineering”**, *Dept. of Information Technology, ATEI of Thessaloniki*, Thessaloniki, Greece, *Grade: 7.22/10*.
- 11/2012
  - » **BSc Thesis**: “Studying Quality of Experience (QoE) over Wireless Networks”.

## Awards, Patents, Grants & Scholarships

- 07/2020 **Innovate UK Grant no. 53707**, £2,177,375, SYNERGIA Project, Bid Writer.
- 03/2020 **U.S. Patent**, *US449398*, System and Method for Detecting and Rectifying Concept Drift in Federated Learning (*filed*).
- 01-03/2020 **Innovate UK Grant no. 133989**, £427,480, CAVShield Project, Work Package Leader, Bid Writer.
- 05/2019 **IEEE Best Paper Award**, *IEEE Vehicular Technology Conference (IEEE VTC-Spring)*, 2019.
- 12/2018 **IEEE Popularity Award**, *IEEE Vehicular Networking Conference (IEEE VNC)*, 2018.
- 09/2014 **Full EPSRC Studentship Funding**, *University of Bristol*, UK.

## Technical Skills

- Virtualisation**: Docker, Proxmox, Google Cloud Platform (GCP), Amazon Web Services (AWS).
- Automation**: Kubernetes (K8s, K3s, MicroK8s), Docker Compose, Serverless (OpenFaas), Vagrant, Ansible.
- Programming**: C, C++, MATLAB, Bash, GoLang, Python, HTML, CSS, Javascript, PHP, Java.
- Databases**: MySQL, PostgreSQL, InfluxDB, IBM DB2.
- Networking**: HAProxy, NginX, Wireshark/Tcpdump, Iperf3, OpenVPN, DHCP, DNS, FTP, LDAP, Nmap.
- Monitoring**: Grafana, Prometheus, Elastic, Kibana, Fluentd/FluentBit.

**Productivity:** Git, Jira (Scrum, Kanban), Trello, LaTeX, MS Office, CI/CD pipelines (TravisCI, Jenkins).

**SDRs:** National Instrument's LabVIEW, GNU Radio.

**Simulators:** OMNeT++ (including Veins), SUMO, NS-2, NS-3, OPNET.

**OSs:** Linux-based Distributions (including kernel and driver programming), OS X, MS Windows.

**Video/Image:** Adobe software suite (After Effects, Photoshop and Premiere), GIMP, OmniGraffle.

## Personal Development

### Training and Certifications

08/2020 **"Kubernetes MasterClass : Kubernetes & Docker Swarm for DevOps"**, Udemy.

08/2020 **"Machine Learning"**, Coursera, organised by Stanford University.

02/2011 **Cisco Certified Network Association (CCNA)**, *Dept. of Information Technology*, ATEI OF THESSALONIKI, Thessaloniki, Greece.

08/2008 **Network Administration Professional Certificate**, *Vellum Global Educational Services*, UNIVERSITY OF CAMBRIDGE, Thessaloniki, Greece.

### Summer Schools

06/2018 **"5G V2X Communications Summer School"**, Organised by: King's College London, London, UK..

07/2016 **"Car as a Service - creating tomorrow's smart mobility service platform"**, Organised by: BMW, EURECOM, and Technische Universität München, Tegernsee, Germany..

## Volunteering

- › Industrial Mentoring Scheme, Faculty of Engineering, University of Bristol.
- › Technical Program Committee member and reviewer - several conferences and journals.
- › Organisation of the annual "CDT in Communications" conferences.
- › Organisation of outreach activities of the University of Bristol for post-16 year old pupils.
- › Organisation of Media Days and Public Events for FLOURISH and VENTURER projects.
- › SYMBIOSIS - Journalist and event organiser: Anti-racism, multi-cultural environments for the diversity of humans.

## Interests & Hobbies

Basketball, Cycling, Video and Photo Editing, Travelling, Sketching, Chess.