

Dr Ioannis MAVROMATIS

Lead 5G/Future Networks Technologist

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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
- › AI/ML: MLOps, Predictive Analytics, Model Lifecycle
- › Software: Life-cycle, engineering & development
- › 5G & Beyond, V2X & IoT systems and standards
- › R&D: Experience on both Research & Development
- › Bid Writing (Horizon & National)
- › Technical Leadership & Team Management

Professional Experience

Industrial & R&D Positions

- 11/2023 - now **Lead 5G/Future Networks Technologist**, *Digital Catapult*, London, UK.
- › **REASON** - Leading the **software architecture** and development of a **cross-domain orchestration platform**.
 - Developing an **energy monitoring framework** for cloud-native infrastructures.
 - Engineering **energy-efficient ML and FL** solutions for next-gen networks.
 - Delivering **resource allocation and orchestration** solutions for cross-domain deployments.
 - › **N-CONNECT** - Assessed the feasibility of **deployment of 4G/5G Nomadic Nodes** in Nepal.
 - › **Other** - Authored **bid proposals** in: Wireless Comms., 5G and Beyond, Future Networks, Digital Twins, ML.
 - Conducting **research** and writing **patents** in: Wireless Comms., IoT, ML, Sustainability.
 - Actively contributing to **strategic discussions** and **technology roadmap** planning, shaping future initiatives.
 - **Managing a team of 4 direct reports**, overseeing their development and project contributions.
- 10/2021 - **Principal Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- 11/2023
- › **GreenML** - Developed **energy-efficient ML / FL** solutions, reducing consumption for IoT and O-RAN deployments.
 - Investigated **power capping optimisation** for MLOps deployments, balancing energy / performance.
 - Implemented **ML quantisation optimisations**, reducing operational power requirements.
 - › **SYNERGIA** - Developed a **secure IoT Cloud-native platform**, enabling scalable and secure IoT solutions.
 - Implemented a **federated identity** and **access management framework** for IoT nodes.
 - Built a **Data Drift Detection Framework** to monitor abnormal data patterns.
 - › **UMBRELLA** - Provided ongoing support and extensions on backend / infrastructure components.
 - **Directed a team of software engineers** developing frontend/backend microservices.
 - Provided **technical consultation** for external partners.
 - Participated in **techno-commercial** discussions.
 - › **BEACON-5G** - Implemented an **IoT API / application marketplace** for a 5G-enabled Cloud-native platform.
 - Integration with the UMBRELLA platform and network.
 - › **U-CARE** - Designed and implemented an **air quality monitoring solution** for care homes.
 - › **Other** - Built a **Concept Drift detection and mitigation** for large-scale Federated Learning environments.
- 08/2019 - **Honorary Research Associate**, *University of Bristol*, Bristol, UK.
- 09/2023
- › Migrated AI-assisted Intelligent Transportation Solutions to 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 software 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** - Developed a **secure IoT Cloud-native platform**, enabling scalable and secure IoT solutions.

- 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** - Implemented **Energy Efficiency** improvements for **WLAN networks** (focus on 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.
- 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.

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".

Patents

- 03/2022 **U.S. Patent, US449398, System and Method for Detecting and Rectifying Concept Drift in Federated Learning.**

Awards

- 09/2024 **AI Award for High Tech & Telecom, National AI Awards, REASON, Software/Network Architect.**
- 09/2022 **Industrial Innovation Award, Connected Britain, UMBRELLA, Lead Backend Architect / Developer.**

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.

Grants & Proposals

07/20 - 11/22 **Innovate UK Grant no. 53707**, £2,177,375, SYNERGIA, Bid Writer.

01-03/2020 **Innovate UK Grant no. 133989**, £427,480, CAVShield, WP Lead, Bid Writer.

Technical Skills

- Virtualisation:** Docker, Proxmox, OpenStack, 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, Redis.
- 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

- » Technical Program Committee member and reviewer - several conferences and journals (2017 - now).
- » Industrial Mentoring Scheme, Faculty of Engineering, University of Bristol (2019 - 2022).
- » Organisation of the annual "CDT in Communications" conferences (2017).
- » Organisation of outreach activities of the University of Bristol for post-16 year old pupils (2016).
- » Organisation of Media Days and Public Events for FLOURISH and VENTURER projects (2017 - 2018).
- » SYMBIOSIS - Journalist/event organiser: Anti-racism, multi-cultural environments for the diversity of humans (2013).

Interests & Hobbies

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