Dr Ioannis MAVROMATIS

Principal Research Engineer

+44 75 3938 2331
ioan.mavromatis@gmail.com
ioannismavromatis.com
ioanmavromatis
ioannismavromatis
v2x-development
I. Mavromatis Scholar
Greek, Born on February 14, 1989

In a Nutshell

- I have extensive experience in architecting, designing and developing R&D solutions across various areas: Cloud-native platforms, Cybersecurity, Data and Concept Drift Detection and Mitigation, 5G and Next Generation Wireless Networking, IoT, and Smart Cities.
- I am the solution architect behind the Cloud-native backend/edge platform for the UMBRELLA IoT ecosystem, currently supporting 250+ nodes across three different IoT testbeds.
- In the past, I developed an open-source AI-assisted 5G simulation framework (DRIVE framework). I also co-led the designing and deploying of a large-scale, open-source, low-latency platform for vehicular communications, aided by Mobile Edge Computing capabilities.
- I have extensive experience in both development and research activities, designing and deploying real-world testbeds and developing simulation tools and algorithms for large-scale experimentation.
- I have been actively involved in several extensive large-scale experimental campaigns on IoT Smart Cities applications and Wireless Protocols and proposed state-of-the-art algorithms for improving the robustness and availability of heterogeneous vehicular communications.

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
- Teamwork/Team management
- Analytical thinking and logical problem fragmentation

Professional Experience

Research & Industrial 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.
  - Intrusion Detection and Prevention solutions for IIoT.
  - Research activities and patent writing in various areas (Cybersecurity, Wireless Comms., Digital Twins.)
  - Bid writing.

08/2019 - **Honorary Research Associate**, *University of Bristol*, Bristol, UK.
- Migrate AI-assisted Intelligent Transportation Solutions with Cloud-native and Mobile Edge Infrastructures.
- Develop a Cloud-Native platform for Reinforcement Learning agents.
- Supervision of students.

10/2020 - 10/2021 **Senior Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- **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.
- **CYTHEMIS** - Improved/demonstrated an end-to-end Intrusion Prevention System.
  - Identified flaws in CYTHEMIS operation and reported findings to Toshiba Japan.
- **Other** - Research activities and patent writing in various areas (Cybersecurity, Intelligent Transport Systems Intrusion Detection and Prevention solutions for IIoT, 5G Mobile Edge Computing Caching).
  - Bid writing.

08/2019 - 09/2020 **Research Engineer**, *Bristol Research & Innovation Laboratory, Toshiba Europe Ltd.*, Bristol, UK.
- **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.
- **Other** - Development of an open-source AI-assisted 5G simulation framework for C-ITSs (DRIVE framework).
  - Research activities and patent writing in various areas (Cybersecurity, Intelligent Transport Systems, Intrusion Detection and Prevention solutions for IIoT).
  - Bid writing (CAVShield and SYNERGIA projects).

10/2018 - 08/2019 **Research Associate**, *University of Bristol*, Bristol, UK.
- **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.
  - Conducted several large-scale city-wide vehicular trial experimental campaigns.
  - Designed an active jammer - tested performance/disruptions on prototyped ITS-G5 testbed.

02/2016 - 09/2018 **Research Assistant**, *University of Bristol*, Bristol, UK.
- **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** - Designed a Fog Computing framework for C-ITSs.
  - "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.
  - Prototyped a testbed to evaluate the performance of the system.

Networking and IT Positions

05-08/2013 07-10/2008 **IT and Network Support and Consultant**, *"Unifast" Kiriakoulis Georgios*, Thessaloniki, Greece.
- 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.
- Installed/configured satellite antenna systems and services.

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

2017/2018 **"Mathematical Methods for Computer Scientists"** , University of Bristol, *BSc 1st year (80h).*
"Networking Protocol Principles" , University of Bristol, *BSc 3rd year / MSc (20h).*
"Programming in C", University of Bristol, *MSc (70h).*
"Object Oriented Programming" , University of Bristol, *BSc 2nd year (45h).*

2016/2017 **"Mathematical Methods for Computer Scientists"**, University of Bristol, *BSc 1st year (80h).*
"Programming and Algorithms 2", University of Bristol, *BSc 1st year (45h).*

2015/2016 **"Digital Signal Processing Systems"**, University of Bristol, *MSc (21h).*

2014/2015 **"Digital Signal Processing Systems"**, University of Bristol, *MSc (21h).*

Other

01/2009 - 04/2012 **Illustrator and Graphics Designer (Images, Videos, Animations)**, *Freelancer*, Thessaloniki, Greece.
- Designed marketing material for small local companies.

06/2010 - 04/2011 **Public Relationship (PR) Specialist**, Thessaloniki, Greece.
- Promotion services on targeted audience for local pubs and bars.

Education

10/2015 - 10/2018 **PhD in Communications (Research Phase)**, *Dept. of Electr. & Electron. Engineering, University of Bristol*, Bristol, UK.
- **PhD Title:** "5G Communication Framework for Smarter Autonomous Vehicles".

Supervisors: Prof Robert Piechocki, Prof Andrew Nix.
Key achievements - Developed a discrete-time system-level simulation framework for C-ITS research.
- Deployed a real-world ITS-G5 testbed - large-scale car trials were conducted later.
- Developed various novel solutions for the integration of MmWaves in the future C-ITSs.

10/2014 - 09/2015 **PhD in Communications (Taught Phase)**, *Dept. of Electr. & Electron. Engineering,* University of Bristol, Bristol, UK.
One-year taught element (10 taught modules and a research group project).
- **1st Year's Research Group Project:** "Localisation Of Strayed Targets (LOST)" (taught phase).

Supervisor: Prof Kevin Morris.
Design and development of a localisation system, over the White Space frequency band (implemented in LabView).

09/2013 - 09/2014 **MSc in "Wireless Communications and Signal Processing"**, *Dept. of Electr. & Electron. Engineering, University of Bristol*, Bristol, UK, *Grade: 68% - Pass with Merit*.
Advanced topics on wireless communications and communications-related signal processing.
- **MSc Thesis:** "Propagation Modelling using Iterative Physical Optics".

Supervisor: Prof Christopher Railton.
Design and development of a simulation framework, able to predict the performance of indoor communication links using Iterative Physical Optics (IPO) algorithms.

05/2007 - 11/2012 **BSc in "Information Technology Engineering"**, *Dept. of Information Technology, ATEI of Thessaloniki*, Thessaloniki, Greece, *Grade: 7.22/10*.
Scientific and technological knowledge in "Computer Science and Engineering" and "Information and Communication Systems".
- **BSc Thesis:** "Studying Quality of Experience (QoE) over Wireless Networks".

Supervisor: Prof Periklis Chatzimisios.
Investigate the impact of different wireless technologies (IEEE 802.11, IEEE 802.16, 3GPP LTE) on various data streams, using QoE metrics.

Patents

03/2020 **U.S. Patent**, *US449398*, System and Method for Detecting and Rectifying Concept Drift in Federated Learning.

Grants

Completed Research

07/2020 **SYNERGIA Project**, ***Amount Awarded: £2,177,375***, Innovate UK, Project no. 53707, **Period**: 01/10/2020 - 30/09/2022.

- **Core Bid Writer.**

SYNERGIA will devise, develop and demonstrate a novel secure-by-design, endpoint-to-core IoT platform for large-scale networks of low-power resource-constrained devices. *Project is led by BRIL - Toshiba Europe Ltd.*

12/2019 **CAVShield Project**, ***Amount Awarded: £427,480***, Innovate UK, Project no. 133898, **Period**: 02/01/2020 - 31/03/2020.

- **Core Bid Writer, Technical Work Package Lead, Lead Role within Toshiba's BRIL.**

The CAVShield project addressed the urgent global need for robust methods and techniques to identify and measure cyber-vulnerabilities in fleets of connected vehicles. *Project was led by Honda R&D Europe (U.K.) Ltd.*

Awards & Scholarships

05/2019 **IEEE Best Paper Award**, *IEEE Vehicular Technology Conference (IEEE VTC-Spring)*, Kuala Lumpur, Malaysia, 2019.

Best Paper award for my work "Agile Data Offloading over Novel Fog Computing Infrastructure for CAVs".

12/2018 **IEEE Popularity Award**, *IEEE Vehicular Networking Conference (VNC)*, Taipei, Taiwan, 2018.

Popularity award for my work "Parallel Implementation of the OMNeT++ INET Framework for V2X Communications".

9/2014 **Full EPSRC Studentship Funding**.

Studentship to support my PhD research for a 4-year term.

4/2012 **Erasmus Mundus Scholarship**.

Scholarship for my internship in UC3M for a 6-month period.

Personal Development

Training and Certifications

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

Course on Kubernetes, Docker, and Docker Swarm for DevOps, Image Creation & Deployment on Kubernetes, Docker Compose, HELM & HELM Charts.

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

Course providing a broad introduction to machine learning, data mining, and statistical pattern recognition. Topics: i) Supervised Learning, ii) Unsupervised Learning, iii) Best practices in machine learning, etc.

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

Advanced Network Knowledge (Installation, configuration, operation and troubleshooting of medium-size routed and switched networks).

08/2008 **Network Administration Professional Certificate**, *Vellum Global Educational Services,* University of Cambridge, Thessaloniki, Greece.

Basic Network Administration Knowledge (Routing Protocols, TCP/IP, Network Architectures, etc.).

Summer Schools

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

Topics on 5G Vehicle-to-Everything (V2X) communications, as pertained to connected and autonomous driving.

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

Topics on autonomous vehicles and next-generation vehicular applications.

Publications & Datasets

Journals & Magazines

[J4] J. Pope, J. Liang, V. Kumar, F. Raimondo, R. McConville, T. Pasquier, R. Piechocki, G. Oikonomou, B. Luo, D. Howarth, **I. Mavromatis**, A. Sanchez-Mompo, P. Carnelli, T. Spyridopoulos, and A. Khan, "*Resource-Interaction Graph: Efficient Graph Representation for Anomaly Detection*", Arxiv, 2022.

[J3] **I. Mavromatis**, A. Stanoev, P. Carnelli, Y. Jin, M. Sooriyabandara, and A. Khan, "*A Dataset of Images of Public Streetlights with Operational Monitoring using Computer Vision Techniques*", Elsevier Data-in-Brief Journal.

[J2] A. Tassi, **I. Mavromatis**, and R. J. Piechocki, "*A Dataset of Full-Stack ITS-G5 DSRC Communications over Licensed and Unlicensed Bands Using a Large-Scale Urban Testbed*", Elsevier Data-in-Brief Journal.

[J1] **I. Mavromatis**, A. Tassi, G. Rigazzi, R. J. Piechocki, and A. Nix, "*Multi-Radio 5G Architecture for Connected and Autonomous Vehicles: Application and Design Insights*", EAI Industrial Networks and Intelligent Systems. **(Invited Paper)**

Datasets

[D6] U. Erol, F. Raimondo, J. Pope, S. Gunner, G. Oikonomou, V. Kumar, **I. Mavromatis**, P. Carnelli, A. Khan, "*Multi-sensor, Multi-device Smart Building Indoor Environmental Dataset*", 2023, University of Bristol RDF Archive.

[D5] C. Posner, A. Sanchez-Mompo, **I. Mavromatis**, M. Al-Ani., "*A Dataset of Human Body Tracking of Walking Actions Captured Using Two Azure Kinect Sensors*", 2023, Zenodo.

[D4] **I. Mavromatis**, A. Stanoev, P. Carnelli, Y. Jin, M. Sooriyabandara, and A. Khan, "*Public Streetlight Images Dataset*", 2022, Zenodo.

[D3] J. Pope, F. Raimondo, V. Kumar, R. McConville R. Piechocki, G. Oikonomou, T. Pasquier, B. Luo, D. Howarth, **I. Mavromatis**, P. Carnelli, A. Sanchez-Mompo, T. Spyridopoulos, and A. Khan, "*Container Escape Detection*", 2021, GitHub.

[D2] R. Piechocki, **I. Mavromatis**, A. Tassi, "*FLOURISH Car Trials Dataset 2*", 2019, University of Bristol RDF Archive.

[D1] **I. Mavromatis**, R. Piechocki, A. Tassi, "*FLOURISH Car Trials Dataset 1*", 2017, Online Website.

Conferences & Workshops

[C22] T. Chow, U. Raza, **I. Mavromatis**, and A. Khan, "*FLARE: Detection and Mitigation of Concept Drift for Federated Learning based IoT Deployments*", in IEEE IWCMC 2023, Marrakesh, Morocco, Jun. 2023.

[C21] **I. Mavromatis**, and A. Khan, "*Demo: LE3D: A Privacy-preserving Lightweight Data Drift Detection Framework*", in IEEE CCNC 2023, Las Vegas, USA, Jan. 2023.

[C20] **I. Mavromatis**, A. Sanchez-Mompo, F. Raimondo, J. Pope, M. Bullo, I. Weeks, V. Kumar, P. Carnelli, G. Oikonomou, T. Spyridopoulos, and A. Khan, "*LE3D: A Lightweight Ensemble Framework of Data Drift Detectors for Resource-Constrained Devices*", in IEEE CCNC 2023, Las Vegas, USA, Jan. 2023.

[C19] A. V. Katsenou, J. Mao, and **I. Mavromatis**, "*Energy-Rate-Quality Tradeoffs of State-of-the-Art Video Codecs*", in PCS 2022, San Francisco, USA, Dec. 2022.

[C18] D. Anand, **I. Mavromatis**, P. Carnelli, and A. Khan, "*A Federated Learning-enabled Smart Street Light Monitoring Application: Benefits and Future Challenges.*", in ACM MobiCom 2022: MORSE Workshop, Sydney, Australia, Oct. 2022.

[C17] C. Lockie, **I. Mavromatis**, A. Stanoev, Y. Jin, and G. Oikonomou "*Securing Synchronous Flooding Communications: An Atomic-SDN Implementation*", in ACM EWSN '22, Linz, Austria, Oct. 2022.

[C16] **I. Mavromatis**, A. Stanoev, A. J. Portelli, C. Lockie, M. Ammann, Y. Jin, and M. Sooriyabandara "*Reliable IoT Firmware Updates: A Large-scale Mesh Network Performance Investigation*", in IEEE WCNC '22, Austin, Texas, Apr. 2022.

[C15] J. Pope, F. Raimondo, V. Kumar, R. McConville R. Piechocki, G. Oikonomou, T. Pasquier, B. Luo, D. Howarth, **I. Mavromatis**, P. Carnelli, A. Sanchez-Mompo, T. Spyridopoulos, and A. Khan "*Container Escape Detection for Edge Devices*", in ACM SenSys '21, Coimbra, Portugal, Nov. 2021.

[C14] T. Farnham, S. Jones, A. Aijaz, Y. Jin, **I. Mavromatis**, U. Raza, A. Portelli, A. Stanoev, and M. Sooriyabandara, "*UMBRELLA Collaborative Robotics Testbed and IoT Platform*", in IEEE CCNC 2021: RoboCom 2021 Workshop, Virtual, January 2020.

[C13] **I. Mavromatis**, R. J. Piechocki, M. Sooriyabandara, and Arjun Parekh "*DRIVE: A Digital Network Oracle for Cooperative Intelligent Transportation Systems*", in IEEE ISCC 2020, Rennes, France, July 2020.

[C12] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and M. Sooriyabandara, "*On Urban Traffic Flow Benefits of Connected and Automated Vehicles*", in IEEE VTC-Spring 2020, Antwerp, Belgium, May 2020.

[C11] X. Wang, **I. Mavromatis**, A. Tassi, R. Santos-Rodriguez, and R. J. Piechocki, "*Location Anomalies Detection for Connected and Autonomous Vehicles*", in IEEE CAVS 2019, Honolulu, Hawaii, September 2019.

[C10] **I. Mavromatis**, A. Tassi, and R. J. Piechocki, "*Operating ITS-G5 DSRC over Unlicensed Bands: A City-Scale Performance Evaluation*", in IEEE PIMRC 2019, Istanbul, Turkey, September 2019.

[C9] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Efficient Millimeter-Wave Infrastructure Placement for City-Scale ITS*", in IEEE VTC-Spring 2019, Kuala Lumpur, Malaysia, May 2019.

[C8] A. Tassi, **I. Mavromatis**, R. J. Piechocki, A. Nix, C. Compton, T. Poole, and W. Schuster, "*Agile Data Offloading over Novel Fog Computing Infrastructure for CAVs*", in IEEE VTC-Spring 2019, Kuala Lumpur, Malaysia, May 2019. **(IEEE Best Paper Award)**

[C7] A. Tassi, **I. Mavromatis**, R. J. Piechocki, and A. Nix, "*Secure Data Offloading Strategy for Connected and Autonomous Vehicles*", in IEEE VTC-Spring 2019, Kuala Lumpur, Malaysia, May 2019.

[C6] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Parallel Implementation of the OMNeT++ INET Framework for V2X Communications*", in IEEE VNC 2018, Taipei, Taiwan, December 2018. **(IEEE Popularity Award)**

[C5] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*A City-Scale ITS-G5 Network for Next-Generation Intelligent Transportation Systems: Design Insights and Challenges*", in Ad-Hoc Now 2018.

[C4] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Efficient V2V Communication Scheme for 5G MmWave Hyper-Connected CAVs*", in IEEE ICC 2018 Workshop - 5G and Cooperative Autonomous Driving, Kansas, USA, May 2018.

[C3] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Agile Calibration Process of Full-Stack Simulation Frameworks for V2X Communications*", in IEEE VNC 2017, Torino, IT, November 2017.

[C2] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*MmWave System for Future ITS: A MAC-layer Approach for V2X Beam Steering*", in IEEE VTC 2017-Fall, Toronto, CA, September 2017.

[C1] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Beam Alignment for Millimetre Wave Links with Motion Prediction of Autonomous Vehicles*", in IET Colloquium on Antennas, Propagation and RF Technology for Transport and Autonomous Platforms, Birmingham, UK, February 2017. **(Invited Paper)**

Posters

[P1] **I. Mavromatis**, A. Tassi, R. J. Piechocki, and A. Nix, "*Smart Communication Plane for Self-Driving Vehicles*", BMW Summer School: Car as a Service, July 2016.

Book Chapters

[B1] **I. Mavromatis**, and P. Chatzimisios, "*Studying Quality of Experience (QoE) over Wireless Networks*", Encyclopaedia of Information Science and Technology, 3rd Edition, IGI Global, August 2014.

Working / Under submission

[W3] U. Erol, F. Raimondo, J. Pope, S. Gunner, V. Kumar, **I. Mavromatis**, P. Carnelli, T. Spyridopoulos, A. Khan, and G. Oikonomou, "*Dataset: Indoor, Multi-sensor, Multi-device Environmental Data*", submitted to SenSys Data '22 Workshop.

[W2] **I. Mavromatis**, A. Stanoev, A.J. Portelli, I. Weeks, E. Glasspole, S. Jones, B. Holden, A. Aijaz, P. Carnelli, A. Khan, T. Farnham, Y. Jin, and M. Sooriyabandara, "*UMBRELLA: A System-of-Systems Open Platform for Large-Scale IoT Experimentation*", to be submitted to IEEE Access.

[W1] **I. Mavromatis**, T. Spyridopoulos, P. Carnelli, and A. Khan, "*Securing the Cooperative Intelligent Transportation Systems of the Future*", to be submitted to IEEE Transaction on Vehicular Technology.

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.

Scientific Activities - Involvement

TPC Member

2023 CPS-IoTBench, IARIA VEHICULAR
2022 IEEE PIMRC, CPS-IoTBench
2021 IEEE ICC, IEEE CSCN, IEEE PIMRC
2020 IEEE PIMRC, IEEE ICC, IEEE ISCC, IEEE VTC-Spring, IARIA VEHICULAR, Ad-Hoc Now
2019 IEEE VTC-Spring, Ad-Hoc Now, IEEE PIMRC, IEEE VNC
2018 IEEE VTC-Fall, Ad-Hoc Now
2017 IEEE VTC-Fall
2016 IEEE VTC-Fall

External Reviewer – Journals

2023 IEEE Communications Magazine (1), Elsevier Vehicular Communications (1), MDPI Sensors (1), Data in Brief (1)
2022 IEEE Communications Magazine (1), Springer Wireless Networks (1), MDPI Applied Sciences (1), Elsevier Vehicular Communications (1), Data in Brief (1).
2021 Springer Wireless Networks (1), Elsevier Computer Networks (1), MDPI JSAN (2), MDPI Applied Sciences (1).
2020 IEEE Transactions on Vehicular Technology (2), IEEE Wireless Communications Magazine (1), IEEE Journal On Selected Areas in Communications (JSAC) (1), MDPI Applied Sciences (3), MDPI Sensors (2), Elsevier Data In Brief (1), Elsevier Computer Communications (1), Springer Wireless Networks (1).
2019 IEEE Communications Magazine (1), Springer Wireless Networks (1), Elsevier Data In Brief (1), MDPI Energies (2), MDPI Electronics (1).

2018 Springer Wireless Networks (1), Hindawi Journal of Advanced Transportation (1), Elsevier Ad-Hoc Networks (1).

External Reviewer – Conferences

2023 IARIA VEHICULAR (1), CPS-IoTBench (1).

2022 IEEE PIMRC (6), IEEE GLOBECOM (1).

2021 IEEE ICC (3), IEEE PIMRC (2), IEEE CSCN (3).

2020 IEEE ISCC (7), IEEE ICC (6), IEEE PIMRC (2), IEEE VTC-Spring (2), Ad-Hoc Now (2), IARIA VEHICULAR (1).

2019 IEEE PIMRC (4), IEEE VTC-Spring (3), IEEE VNC (3), Ad-Hoc Now (3).

2018 IEEE VTC-Fall (2), Ad-Hoc Now (3).

2017 IEEE VTC-Fall (3).

2016 IEEE VTC-Fall (1).

External Judge – Competitions

2019 Google Science Fair - Preliminary Judge & Scientific Accuracy Judge

2016 Google Science Fair - Preliminary Judge

Students/Interns Advised

PhD Students

2022 - now **Graham Peden**, *PhD Research Project*, PhD in Cybersecurity, University of Bristol.
- **Subject:** "Malicious Firmware Binary Code Vulnerability Detection."

Co-Advisors: Prof Awais Rashid, Dr Aftab Khan.

2022 - now **Othmane Belarbi**, *PhD Research Project*, PhD in Cybersecurity, University of Cardiff.
- **Subject:** "Concept Drift Detection and Mitigation using Serverless Computing."

Co-Advisors: Dr Theo Spyridopoulos, Dr Eirini Anthi, Dr Aftab Khan, Dr Pietro Carnelli.

2022 - now **Vasilis Ieropoulos**, *PhD Research Project*, PhD in Cybersecurity, University of Cardiff.
- **Subject:** "Machine Learning Threat Detection for Low Complexity Edge Deployment: Threats, Risks and Mitigations."

Co-Advisors: Dr Theo Spyridopoulos, Dr Eirini Anthi, Dr Aftab Khan, Dr Pietro Carnelli.

2023 - 2023 (6 Months) **Hamdi Friji**, *PhD Research Secondment*, PhD in Green Cybersecurity, French Alternative Energies and Atomic Energy Commission (CEA).
- **Subject:** "ML-based Intrusion Detection System: A Graph Neural Network Approach."

Co-Advisors: Dr Pietro Carnelli, Mr Adrian Sanchez Mompo, Dr Aftab Khan.

2018 - 2019 (11 Months) **Jonathan Thomas**, *PhD Research Project*, PhD in Communications, University of Bristol.
- **Subject:** "AI-assisted Communication Framework for Self-Driving Vehicles."

Co-Advisors: Prof Robert Piechocki, Dr Raul Santos-Rodriguez.

Interns

2023 (6 Months) **Stefano De Feo**, *Industrial Internship*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Federated Learning Concept Drift Detection and Mitigation: A Large Scale Evaluation."

Co-Advisors: Dr Pietro Carnelli, Dr Aftab Khan.

2021 (3 Months) **Charles Lockie**, *Industrial Internship*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Reliable IoT Firmware Updates: A Large-scale Mesh Network Performance Investigation."

Co-Advisors: Mr Aleksandar Stanoev, Dr Yichao Jin.

2020 (3 Months) **Jonathan Hebditch**, *Research Internship*, Toshiba Europe Ltd.
- **Subject:** "Privacy and anonymity of an Industrial IoT platform: A VPN approach."

2020 (6 Months) **Iosif Koen**, *Erasmus+ Research Internship*, Department of Information Technology, International Hellenic University.
- **Subject:** "Enabling a Smart Edge Computing Plane for CAVs with Kubernetes."

Co-Advisors: Prof Robert Piechocki, Prof Periklis Chatzimisios.

2019 (6 Months) **Samual Taylor**, Undergraduate Research Internship, University of Bristol.
- **Subject:** "A PiCar-based collision avoidance scenario: Design Insights and Experimental Testbed."

Co-Advisors: Prof Robert Piechocki, Dr Andrea Tassi.

2018 (6 Months) **Panagis Artoumas**, *Erasmus+ Research Internship*, Department of Information Technology, International Hellenic University.
- **Subject:** "Enabling Full-Stack City-Scale Simulations for Connected and Autonomous Vehicles."

Co-Advisors: Prof Robert Piechocki, Prof Periklis Chatzimisios.

MEng/MSc Students

2023 (6 Months) **Hanyue Zhang**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Lightweight Ensemble Framework of Data Drift Detectors."

Co-Advisors: Dr Aftab Khan, Dr Pietro Carnelli.

2023 (6 Months) **Jikun Gao**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Towards Federated Learning at Scale: A System Bias Investigation."

Co-Advisors: Dr Aftab Khan, Dr Pietro Carnelli.

2023 (6 Months) **Shengzhe Huang**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "GreenFL: Energy-aware Federated Learning for Large-scale Deployments."

Co-Advisors: Dr Aftab Khan, Dr Pietro Carnelli.

2023 (6 Months) **Vincent Wong**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Quantisation and FL: Improving Sustainability through Energy Reduction."

Co-Advisors: Dr Aftab Khan, Dr Pietro Carnelli.

2023 (6 Months) **Stefano De Feo**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "GreenML: A Smart Way forward for Sustainable Machine Learning."

Co-Advisors: Dr Aftab Khan, Dr Pietro Carnelli.

2022 (6 Months) **Charles Lockie**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Cybersecurity over Large-Scale Mesh Networks with Syncrhonous Flooding."

Co-Advisors: Mr Aleksandar Stanoev, Dr Yichao Jin.

2021 (6 Months) **Marius Ammann**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Everything under one UMBRELLA: Large-Scale Experimentation with a Multi-Radio IoT Testbed."

Co-Advisors: Mr Aleksandar Stanoev, Dr Anthony Portelli.

2021 (6 Months) **Prithvi Jaisingh**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Distributed Intrusion Detection using Novel Federated Learning Approaches."

Co-Advisors: Dr Pietro Carnelli, Dr Theo Spyridopoulos, Dr Aftab Khan.

2020 (6 Months) **Jianwen Zhu**, *Industrial MSc Project*, MSc in Wireless Communications, Toshiba Europe Ltd.
- **Subject:** "A Low Latency MEC Solution for 5G Network Slicing."

Co-Advisors: Dr Jaya Thota, Mr Ben Holden.

2020 (6 Months) **Sanyam Vays**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "AI-Based Intrusion Detection System for Industrial IoT."

Co-Advisors: Dr Theo Spyridopoulos, Dr Aftab Khan, Dr Pietro Carnelli.

2020 (6 Months) **Philip Masters**, *Industrial MEng Project*, BSc in Computer Engineering, Toshiba Europe Ltd.
- **Subject:** "Wireless Coordination of F1/10 Autonomous Vehicles."

Co-Advisors: Dr Anthony Portelli, Dr Michael Baddeley.

2019 (5 Months) **Marie Aylward**, *BSc Project*, BSc in Electr. & Electron. Engineering, University of Bristol.
- **Subject:** "Benefits of Connected and Automated Vehicles on Large-Scale Urban Traffic Flow Use-cases."

Co-Advisor: Prof Robert Piechocki.

2019 (5 Months) **Maria Fernanda Espino Gonzalez**, *MSc Project*, MSc in Communication Networks, University of Bristol.
- **Subject:** "Spectrum Sharing Strategies for WiFi and Intelligent Transport Systems (ITS)."

Co-Advisor: Prof Robert Piechocki.

2019 (5 Months) **Xinluan Bai**, *MSc Project*, MSc in Wireless Communication, University of Bristol.
- **Subject:** "Semi-persistent Scheduling for C-V2X Vehicle-to-Vehicle communication."

Co-Advisor: Prof Robert Piechocki

2019 (5 Months) **Yuanri (Blues) Xing**, *MSc Project*, MSc in Wireless Communication, University of Bristol.
- **Subject:** "Design Practices on an Agile Communication Infrastructure for Autonomous PiCars."

Co-Advisor: Prof Robert Piechocki

2019 (5 Months) **Yudi Fan**, *MSc Project*, MSc in Wireless Communication, University of Bristol.
- **Subject:** "A PiCar-based Collision Avoidance Scenario: Sensor Data Acquisition and a Simulated Approach."

Co-Advisors: Prof Robert Piechocki, Dr Andrea Tassi.

2019 (5 Months) **Zhe (Anton) Zhao**, *MSc Project*, MSc in Communication Networks, University of Bristol.
- **Subject:** "On the Enhancement of Traffic Flows Sharing CAVs Trajectory Intention."

Co-Advisors: Prof Robert Piechocki, Dr Andrea Tassi.

2018 (6 Months) **Matthew Uppington**, *Final Year Project*, BSc in Engineering Mathematics, University of Bristol.
- **Subject:** "Anomaly Detection Mechanisms for Cooperative Autonomous Vehicles."

Co-Advisors: Prof Robert Piechocki.

2016 (5 Months) **Yu (Teresa) Bi**, *MSc Project*, MSc in Communication Networks, University of Bristol.
- **Subject:** "Acquisition and Broadcasting of Enhanced Vehicle Positioning Information via a Linux-Based System."

Co-Advisors: Prof Robert Piechocki, Dr Andrea Tassi.

2016 (5 Months) **Xiaoyu Ye**, *MSc Project*, MSc in Communication Networks, University of Bristol.
- **Subject:** "Reducing the Interference of Vehicular Communications."

Co-Advisors: Prof Robert Piechocki, Dr Andrea Tassi.

Languages

English: Fluent, **Greek**: Native Speaker, **German**: Conversational, **Spanish**: Basic Level

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.
- SYMβIOSIS - 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.

References

**May be pleasantly given upon request...*