Tsvetan I. **Zhivkov**

MULTI-ROBOT SYSTEMS · MACHINE LEARNING

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"I am an enthusiastic researcher in robotics, artificial intelligence and machine learning."

Experience

Lincoln Agri-Robotics (LAR), University of Lincoln   *Lincoln, United Kingdom*

POSTDOCTORAL RESEARCHER   *May 2020 - present*

- Maintenance and configuration of 5G and WiFi systems.
- Researching the speed-up of 5G agri-robotics communication and developing code for the analysis of quality-of-service metrics and data representation.
- Setup of robotics arena for teaching and postgraduate research in fleet robotics and agri-robotics.
- Liaised in planning, organisation and execution of demonstrations and presentations during the Fresh Produce Consortium (one of the University's biggest agri-events).
- Integration of custom sensors (LiDAR with Raspberry pi) for UAV and performed flights to scan crops and for mapping.
- Held guest seminars on "*multi-robot system design and implementation*" to postgraduate students.

Engineering Department, King's College London   *London, United Kingdom*

ROBOTICS ENGINEER   *Dec. 2019 - Apr. 2020*

- Part-time: Tasked with developing custom drivers for specialist robotic hardware; and development and delivery of workshops for robotic applications of specialised multi-sensor perception.

Faculty of Natural & Mathematical Sciences, Graduate Teaching Scholarship, King's College London   *London, United Kingdom*

TEACHING ASSISTANT   *Oct. 2015 - Apr. 2020*

- Lab assistant for: 4th year Data Mining (Python), Computer Vision (MATLAB) and Computer Programming for Data Science (Python), 2nd year Database Systems (SQL/SQLite), 1st year Programming Practise & Applications (JAVA)
- Taught tutorials/seminars for: Programming Practise & Applications and Computer Vision.
- Marked assignments, coursework and delivered either written or verbal student feedback for: Programming Practise & Applications, Computer Programming and Data Mining.

Centre for Robotics Research recruitment & outreach, King's College London   *London, United Kingdom*

DEMONSTRATOR/PRESENTER   *Jun. 2016 - Present*

- Performed robotic demonstrations for industry professionals and potential students.
- Co-organiser of the 2017 open day for Centre for Robotics Research (CoRe) group. The main role as a co-organiser was to liaise meetings, organise demonstrations and help set up the room for demonstrations.

Summer Internship on Data Capture, University of Liverpool   *Liverpool, United Kingdom*

APPLICATION DEVELOPER   *Jun. 2014 - Sep. 2014*

- Tasked with researching means of retrieving text and image data from users who are operating mobile devices (iPad).
- Designed a prototype application that enabled users to take photographs, annotate them and leave comments.
- Implemented a method for the application to store data locally on the device and allow multi-platform (MS Windows or MacOS) data retrieval for analysis.

Education

King's College London   *London, United Kingdom*

PhD (GRADUATE TEACHING SCHOLAR) IN COMPUTER SCIENCE   *Sep. 2015 - Mar. 2020*

- **Research Title:** A Multi-Robot Communication Framework for the Analysis and Mitigation of Network Perturbations.
    - Investigated the impact that disrupted communication has on multi-robot teams.
    - Evaluated simulated and physical robot empirical results, using a large collection of performance metrics.
    - Developed algorithms to mitigate detriments (failure) indicated by the performance metrics.
- **Research Field(s):** Multi-robot systems, communication-based control, agent behaviour.

University of Liverpool   *Liverpool, United Kingdom*
MEng in Computer Science and Electronic Engineering   *Sep. 2011 - Jul. 2015*
- **Fourth year group project:** Robot Object Search and Retrieval Team - Developed an application to improve human-robot interaction.
- **Third year project:** Multistage Electromagnetic Projectile Accelerator.

Publications

The need for speed: How 5G communication can support AI in the field   *Virtual*
Presented at UKRAS21 Conference: Robotics at home   *Jun. 2021*

A multi-robot communication framework for the analysis and mitigation of network perturbations   *King's College London*
PhD Thesis   *Jul. 2020*

Modelling variable communication signal strength for experiments with multi-robot teams   *Lincoln, United Kingdom*
Presented at UKRAS20 Conference: Robots into the real world   *May 2020*

MRComm: Multi-Robot Communication Testbed   *London, United Kingdom*
Presented at the 20TH Towards Autonomous Robotic Systems Conference   *Jul. 2019*

Establishing Continuous Communication through Dynamic Team Behaviour Switching   *Loughborough, United Kingdom*
Presented at the 2ND UK-RAS19 Conference on Embedded Intelligence: Enabling & Supporting RAS Technologies   *Jan. 2019*

Measuring the Effects of Communication Quality on Multi-Robot Team Performance   *Surrey, United Kingdom*
Presented at the 18TH Towards Autonomous Robotic Systems Conference   *Jul. 2017*

Skills and interests

Relevant skills

Programming	Python, MATLAB and C++ (in order of knowledge/expertise).
Software	Git (version control), Latex and Microsoft Office.
Frameworks	Robot Operating System (ROS) and scikit-learn (Python machine learning library).
Operating Systems	Linux (Ubuntu and CentOS), Microsoft Windows and Mac OSX.

Hobbies and interests

Computer building	Passionate about building computers and keeping up to date with current technology trends and news.
Fitness	Regularly indulge in fitness activities including weightlifting, bouldering and tennis.
RPG	Currently running two Dungeons and Dragons campaigns as a Dungeon Master.