Dr. Thomas E. Kent

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Summary

- A post-doctoral researcher with 9 years of experience with research specializations including decision making, path-planning, optimization, robotics, control, machine learning and multi-agent systems.
- Eight first author journal and conference publications, showcasing novel solutions to problems ranging from formation flight path optimisation to facilitating some of the first UK autonomous car trials.
- Planned and supervised a range of MSc and PhD research projects covering autonomous vehicle traffic flow simulation, learning model-based driving behavior and, fail-safe path planning.

Professional Experience

Senior Research Associate – Applied Mathematics and Computer Science
University of Bristol, Thales-Bristol Partnership in Autonomous Systems Engineering, 2018 - 2022

- Exploring heterogeneous multi-agent systems problems involving tasking, routing and surveillance.
- Designed a decentralized evolutionary algorithm to solve a dynamic task allocation & routing problem
- Created scalable single-agent policies for persistent surveillance, including reinforcement learning, neuro-evolution and heuristic approaches, exploring emergent behaviour in scaling to multiple agents.
- Building a Multi-Agent System simulation software for testing and deployment of novel algorithms on a range of vehicles. This included a flexible web-based GUI to enable 'human in the loop' scenarios.

Research Associate – Bristol Robotics Laboratory
University of Bristol, Venturer Project, 2015-2018

- Developing path-planning and decision-making capabilities for flagship £5m UK driverless car project.
- Scoping, implementing and testing algorithms capable of reliably and repeatably producing high level trajectories to enable a series of increasingly complex real-world participant-led trials.
- Created a Behavior Tree approach to allow flexible, modular construction of trials, coupled with a suite of path-planning algorithms to provide comfortable and safe trajectories for a range of scenarios. Importantly the code was designed to run on both the real vehicle and in the project's driving simulator.
- The system successfully drove 60 participants through scenarios incorporating interactions with pedestrians, cyclists and cars - demonstrating technology such as vehicle-to-vehicle communication.

Education

PhD in Aerospace Engineering
University of Bristol, UK, 2011-2015
Thesis - "Optimal Routing and Assignment for Commercial Formation Flight" - Developed a fast, analytic solution to the formation routing problem to make the associated massively combinatorial allocation optimization problem tractable and demonstrating potential for up to 13% fuel savings.

Master of Arts with Honours Pure Mathematics
University of Edinburgh, UK, 2007-2011

Additional Skills

Python | MATLAB | JavaScript | C/C++ | ROS | AMPL | Linux | TensorFlow | Git | Latex