

Application Driven Analysis of Dynamical Systems: Complexity and Regularity

PhD project

Project description:

The Department of Computer Science of University of Hertfordshire invites applications for a PhD position in theoretical computer science and/or computational optimisation.

We are looking for a mathematically talented PhD student with excellent programming skills to continue our research on the analysis of hybrid dynamical systems. Such systems typically come with a wide range of applications including verification tools for deep learning networks and safety verification of autonomous systems, biological systems (modelling processes on cell membranes), robotics (the configuration space of a robotic arm) and learning algorithms (finding a low-dimensional parameterization of high-dimensional data).

The project will involve theoretical work on identifying new classes of dynamical systems for which the problems such as stability, reachability and/or mortality are decidable, designing algorithms for such cases and evaluating their computational complexity. It may also involve software development, and, on a small scale, experimental work. The successful candidate is expected to advance theory as well as computational methods.

There is flexibility in the type of research the PhD student can conduct. We welcome all candidates, those who are interested to work on mathematical insights of algorithms and those who are inspired by applications or by the challenge of bridging the gap between theory and practice.

Further details:

The position is available for a 3-year period. The starting date is negotiable but should ideally be around January-February 2023.

Required qualifications:

- MSc degree (or equivalent, giving access to doctoral studies) in Computer Science, Mathematics, Electrical Engineering, or a related field. Students about to complete their MSc will also be considered.
- Excellent academic record, showing a strong theoretical/mathematical background.
- Proficiency in at least one programming language, such as C++, Java or Python.
- Excellent communication skills in English, spoken and written.

More information:

Do you recognize yourself in this profile and would you like to know more? Please contact Dr Olga Tveretina (mailto: o.tveretina@herts.ac.uk).