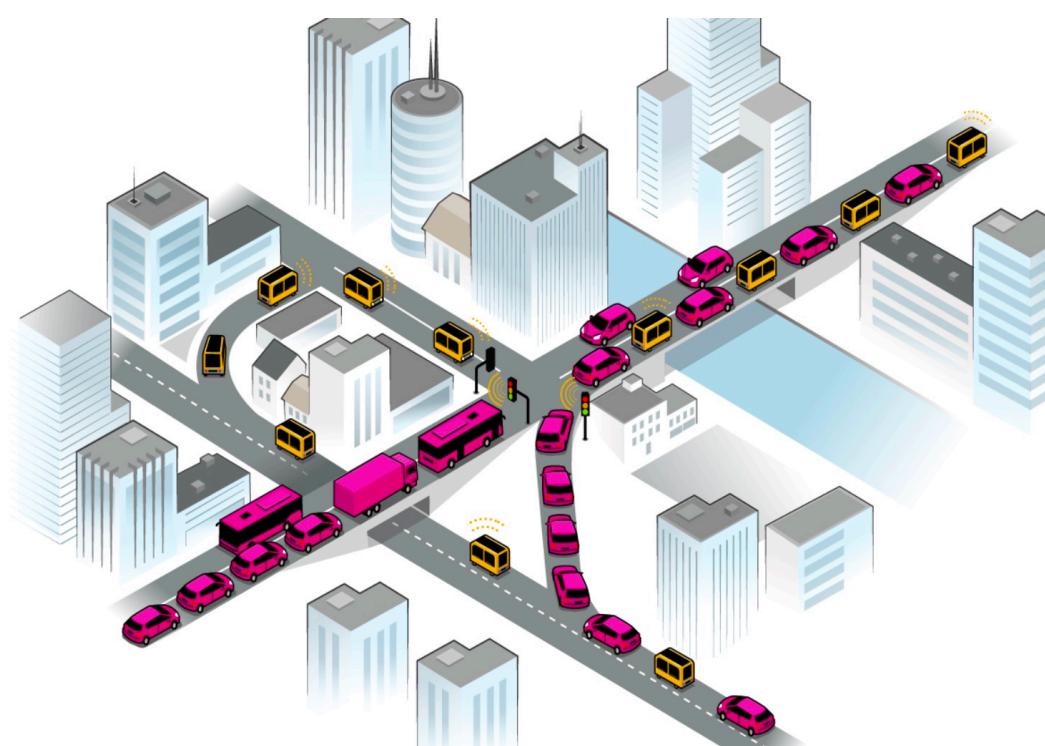


# COeXISTENCE

## Playing urban mobility games with intelligent machines

In COeXISTENCE, with the team of 4, we will to foresee what happens when our cities are shared with autonomous, intelligent robots - competing with us for limited resources. We create virtual environments where individual agents compete to arrive faster, more reliably and cheaper at their destinations. Human agents are simulated with detailed behavioural models, estimated and calibrated on the field data to reproduce how we behave and adapt in the cities. In the same environment the deep learning agents try the same - they use deep reinforcement learning to maximise their rewards. This creates a harsh competition in which machines have upper-hands strong enough to beat us.



COeXISTENCE is a broad and deep experiment in virtual environment on future cities, aimed to discover the new phenomena and propose the new solutions.

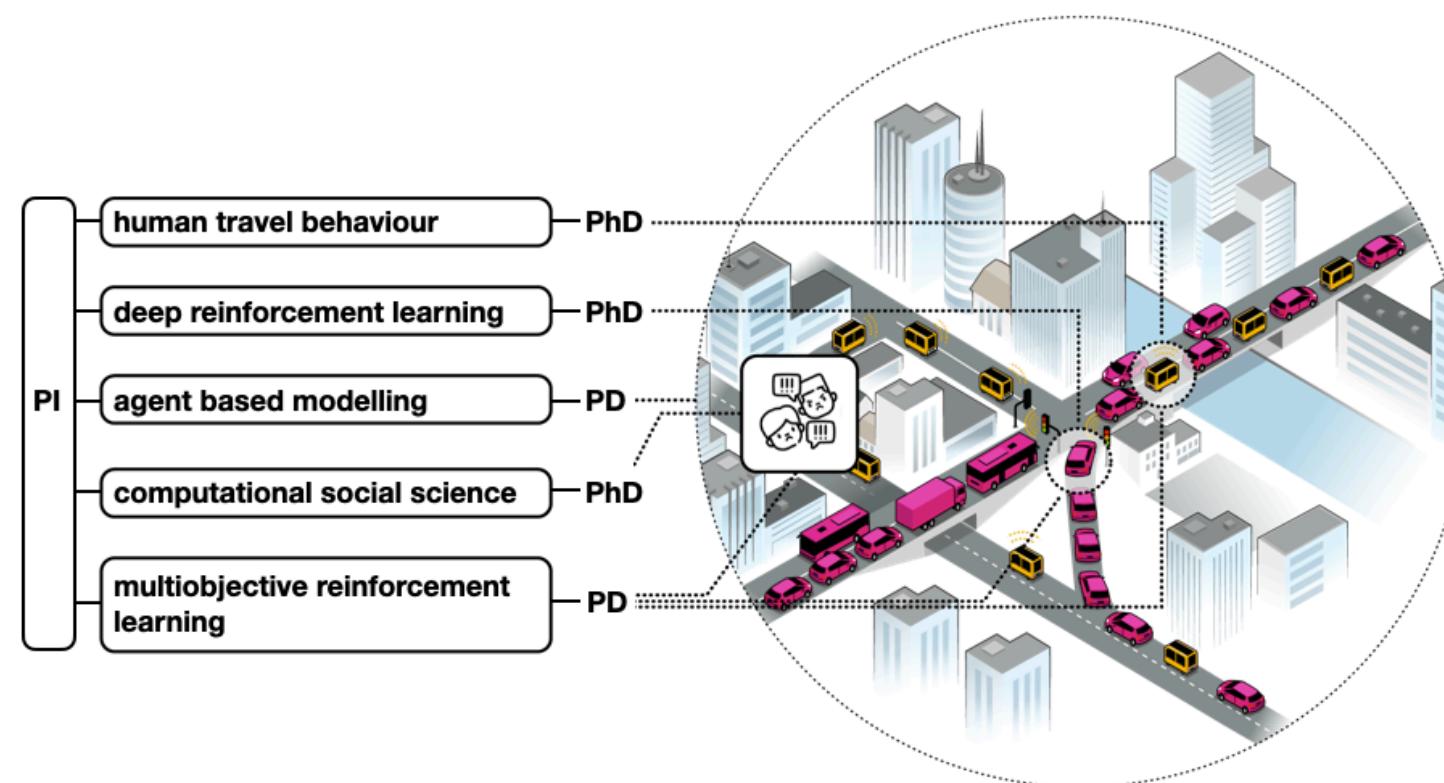
It spans between fields as diverse as:

- game theory
- deep reinforcement learning
- complex social systems
- sustainability
- urban mobility
- agent based modelling
- discrete choice theory

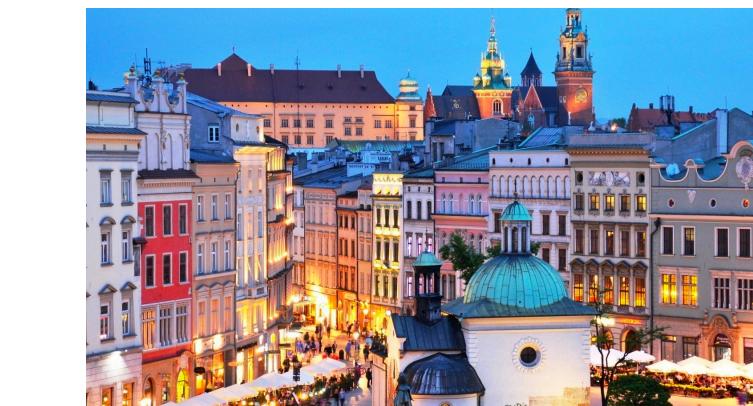
## PhD and PostDoc positions in ERC Starting Grant

### Multi-Agent Reinforcement Learning in Urban Mobility

- **PhD 1** with a background in deep reinforcement learning, ideally holding a master's degree in computer science with experience in developing state-of-the-art RL models. You will focus on implementing RL frameworks into the agent-based models of urban mobility, he will work closely with a PostDoc of similar experience forming a core of machine-learning component of the project.
- **PhD 2** with a background in modelling urban mobility, ideally holding a master's degree in transportation engineering. You will focus on reproducing urban mobility in agent-based models of urban mobility. The main tasks will be to create virtual environments accurately reproducing future of urban mobility and to actively search for conflicts in the urban mobility games.
- **PhD 3** with a background in computational social sciences, experienced with analysis of social systems. She/he shall have a strong experience in complex systems to cover the complexity of the mixed environment of humans and machines. She/he will introduce the behavioural component into the project, with ethical dilemmas, the trade-off between transparency and efficiency and multi-objective data-driven optimization of social systems.
- **PostDoctoral** researcher with experience in deep reinforcement learning and software development. She/he will work on a daily basis with the PhD students to integrate the software development process and manage the computational environment of the project.



## Kraków, Poland



Come and join us at one of oldest universities in Europe, founded **1364** in Kraków (Poland) with Copernicus and Pope John Paul II in its alumni.

With one of leading Machine Learning groups in Central Europe (GMUM) and this prestigious ERC Starting Grant, the **Jagiellonian University** is the place for you to grow.

**Kraków** is one of the most wonderful medieval cities in Poland, Europe. Its breathtaking scenery and rich history are only an invitation to this stunning nation full of modern spaces, trendy restaurants, and bars. Furthermore, the combination of the city's housing ratings, cost of living, and healthcare are very attractive worldwide make it an ideal choice to relocate and be living in Krakow. No wonder, Krakow has become increasingly popular as an expat location in recent years.

Competitive **salaries** (~3000€ with the living cost at ~50% of Western Europe)

