CPS-LAB

CYBER-PHYSICAL SYSTEMS LAB
AT UPPSALA UNIVERSITY

Master Thesis Projects at the
Cyber-physical Systems Lab

About us

Cyber-physical Systems Lab (CPS-Lab)

Cyber-physical Systems Lab at Uppsala University is dedicated to advancing the field of cyber-physical systems (CPS) through cutting-edge research, innovation, and collaboration.

Cyber-physical systems represent a paradigm shift in technology, bringing together the realms of physical and computational elements to create interconnected systems that interact with the physical world. These systems encompass a wide range of applications, including intelligent robots, smart cities, autonomous vehicles, industrial automation, connected healthcare systems, and more.

At our lab, we strive to explore the vast potential of CPS and shape its future impact on these various domains by proposing methods, methodologies, applications and frameworks for improving their interoperability, sustainability, complexity, autonomy and intelligence.

Our team of interdisciplinary researchers, comprised of experts from computer science, electrical engineering, mechatronics, control systems, and other relevant fields, is at the forefront of CPS research. We undertake studies to develop novel theories, algorithms, and practical solutions that bridge the gap between the physical and virtual worlds. Below you can see the photos of some of the systems we have at the lab.

At the CPS-Lab, we are pushing the boundaries of what's possible with autonomous systems, robotics, and artificial intelligence. As a master's thesis student here, you will have the chance to work on cutting-edge technologies and real-world applications that can make a difference. We have prepared three challenging and impactful thesis projects that align with our lab's focus areas. These projects offer you the opportunity to develop technical skills, publish research (we will also fund conference attendance, travel and accommodation if you get accepted to present the research), and lay the foundations for a career in intelligent and autonomous systems.

We are seeking talented, motivated students who want to be at the forefront of innovation with the vision to change the world. If you are eager to test your abilities, gain hands-on experience, and expand the horizons of autonomous robots, computer vision, or multi-agent systems, we encourage you to apply for one of the following projects:

- **Beach litter identification/detection:** At CPS-Lab we are running a project which aims to build connected systems of system that will be able to clean different type of beaches from litter. As a master student at the lab, you will help with this project by firstly running a review study to identify already existing datasets and identification algorithms. Then you will run a comparative evaluation of the existing approaches possibly followed by some improvements.

In CPS-Lab we do not only offer our students exciting research topics, but we also help them develop project management skills, and provide support and guidance from more experienced research students and senior researchers to prepare them for their future career.

If you are interested to put your skills to make the world a better place, we are happy to meet and listen to you.

Help keep our beaches and oceans clean using AI and robotics! ☺

If you are interested in any of these thesis project opportunities, please send your CV and a short statement of interest to Dr. Didem Gurdur Broo at didem.gurdur.broo@it.uu.se

In your email, please specify which project(s) you are most excited about and why you believe you would be a good fit. We will review applications and schedule 30-minute discussions with promising candidates to further describe the projects, answer questions, and determine alignment with student interests and capabilities. Spots are limited, so we encourage you to apply early if you would like to secure a position.

We look forward to hearing from you!