

# MSCA Doctoral Student in SecReSy4You Network on Critical Cyber-Physical Systems Security and Resilience with a Focus on Context-Based Threat Detection

*Are you interested in working in a European doctoral network on the security and resilience of critical infrastructure, supported by leading researchers across Europe? Are you looking for an employer that invests in its people and offers excellent working conditions in an international research environment? We welcome you to apply for PhD positions in the SecReSy4You Doctoral Network, funded by the Marie Skłodowska-Curie Actions (MSCA). This advertisement focuses on the position hosted by the Department of Mathematics, University of Padova, Italy. For a complete list of available positions, please visit the network's website [www.secsy4you.eu](http://www.secsy4you.eu).*

## What is the Doctoral Network about

Critical infrastructures and cyber-physical systems face increasing risks from cyberattacks exploiting vulnerabilities in digital communication networks, embedded hardware, and software. These attacks have far-reaching consequences, including the potential to collect sensitive information, cause physical damage, and endanger human lives.

In response to these challenges, the European MSCA Doctoral Network **SecReSy4You** aims to train a new generation of 10 researchers in cybersecurity and resilience for cyber-physical systems (CPS). The 10 doctoral candidates will collaborate on modeling threat actors, developing scalable AI-based monitoring and control systems, and designing strategies to ensure long-term CPS protection. Through a comprehensive training program combining technical expertise with transferable skills, they will be well-prepared for careers in this rapidly evolving field. **SecReSy4You** will drive innovation in CPS security through cutting-edge research, industry collaboration, and the development of practical tools tailored to real-world challenges.

The network brings together leading research institutions and companies from Austria, Cyprus, Estonia, Germany, Italy, Spain, Sweden, and the Netherlands. It comprises 10 closely connected research projects and a joint doctoral training program.

## What is the Doctoral Project about

Cyber-physical systems need to solve complex tasks during their operations, such as taking safety-sensitive decisions based on their surrounding environment. The significant advancements brought by collaborative perception in sensing a system's surrounding in dynamic scenarios (e.g., bird's eye view on a transportation system) make the advent of fully autonomous systems a near-future reality. However, securing the exchange on environmental information and verifying their correctness although coming from a seemingly trusted entity in the network requires tailored solutions.

This doctoral project aims to develop contextual-based intrusion and anomaly detection algorithms to cope with the presence of insider attackers in collaborative perception

tasks. Furthermore, it plans to test the resiliency of these solutions against stealthy sensor-based attacks aiming at deviating a system's perception.

## **Your Responsibilities and Duties**

- Interdisciplinary research on CPS security with a focus on cooperative detection in autonomous systems.
- Publication of scientific results in top journals and at flagship security conferences.
- Contributions to network-wide events. Performing (transnational) academic and/or industrial secondments.
- Contributions to teaching and/or other departmental tasks (but limited to 10% of the working time).

## **Your Qualifications and Requirements**

- The MSCA mobility rule requires applicants to not have resided or carried out their main activity (work, studies, etc.) in the country of their host organization for more than 12 months in the 3 years immediately prior to the recruitment date.
- Excellent degree (Master of Science or equivalent) in Computer Science, Electrical and Computer Engineering, Cybersecurity, or any other relevant field.
- Strong background in cybersecurity.
- High proficiency in programming (C, C++, Python, ROS, or Matlab).
- High proficiency in English, both written and spoken.
- Knowledge in control theory will be considered an advantage.

## **What we offer**

- A full time position with a gross salary of € 44.084 including living and mobility allowances, rising to € 48.899 if the family allowance is also applicable, in accordance with MSCA regulations.
- Work in an interdisciplinary network of national and international collaborators at an outstanding research institution.
- Active supervision and promotion of your scientific development toward a PhD.
- A close integration of fundamental research and applications.

- Access to state-of-the-art research facilities and resources, including high performance compute clusters.
- A collaborative and supportive research environment with an international, friendly, and dedicated team.
- A balanced and family-friendly work-life relationship.

## **Your application**

If you are interested in the position, please apply via the following link until April 27th:  
<https://servizi-esterno.math.unipd.it/userlist/lista/view?id=185>

Your application should include:

- A cover letter (at most 2 pages) of the applicant's motivation for applying for this position and the earliest possible starting date.
- Your CV
- Your degrees and transcript of records with grades (translated to English or Italian)
- Your Master's thesis