PROJECT REPORT

Women in Robotics: Attracting the Underrepresented Gender in Robotics Research

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Abstract: The goal of this project was to attract a female Ph.D. student in Robotics from underdeveloped countries in South America to cooperate with researchers from HH and LiU, during a period overlapping the ELLIIT Focus Period in Halmstad. The participant, the PhD student Monielly Monteiro (from Federal University of Rio Grande do Sul, Brazil), presented her academic and professional backgrounds and delivered a seminar on her research, covering AI-supported UAV operations in façade cleaning and precision agriculture. She also took part in WARA-PS activities at Gränsö Slott, on the island of Gränsö in Västervik, featuring demonstrations of robotic systems and interacting with researchers from Halmstad University, Linköping University, and Saab. Mariusz Wzorek and Piotr Rudol introduced her the activities, during which researchers demonstrated their respective work. In this context, virtual simulations and hardware trials were conducted in preparation for field tests involving cooperation between aerial and ground vehicles. The experience was complemented by a week of direct collaboration with the robotics AILAB laboratory at Linköping University, led by Mariusz Wzorek. During this visit, she performed experiments involving aerial detection of ArUco markers, georeferencing of their positions, and transmission of coordinates for autonomous navigation by the Husky ground robot. These activities expanded knowledge exchange and established a new collaboration in robotics, with prospects for continued joint research.

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Photos of the Activities



Poster presentation at the ELLIIT Focus Period in Halmstad.

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Photos of the preparation of the performed experiments during the visit to the AILAB at LiU.



Photo of Monielly with the team at the AILAB-LiU.

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Photo of the preparation to fly the drones in the WARA-PS.

Conclusion

The ELLIIT Focus Period provided a broad perspective on advances and challenges in artificial intelligence, connecting computational methods with their practical applications and societal implications. Presentations and discussions deepened the exploration of robustness, reliability, explainability, and responsible use of these technologies, while bringing together research in robotics, autonomous systems, and data analysis. Interaction among participants from different institutions and career stages helped identify complementary interests and opportunities for joint work.

The participation of six women, representing 30% of the invited scholars in the Focus Period, also deserves recognition for strengthening female representation in technological fields. Their contributions to presentations, discussions, and scientific activities highlighted the

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work of women researchers and reinforced the importance of expanding opportunities for women's participation, leadership, and collaboration in science and technology.

Participation in WARA-PS provided opportunities to observe demonstrations of robotic systems research and conduct experimental activities involving cooperation between unmanned aerial vehicles and ground robots. Virtual simulations and hardware trials supported preparation for field tests, enabling perception, communication, and navigation components to be checked before their integrated execution. This experience contributed directly to the PhD research being conducted at UFRGS, which focuses on integrating aerial perception, communication, and autonomous ground robot navigation for agricultural monitoring and intervention.

During the collaboration week at Linköping University, the experiment conducted in the WARA-PS setting was successfully reproduced: the drone detected ArUco markers, determined their georeferenced positions, and transmitted the coordinates so that the Husky could navigate autonomously to the targets. This result provided preliminary validation of the integration between aerial perception and ground navigation under the evaluated conditions. The markers served as reference targets for system development, providing an experimental foundation for future progress towards detecting real targets of agricultural interest.

Collaboration with Professors Mariusz Wzorek and Piotr Rudol and their team established a new research partnership with the Linköping laboratory, creating opportunities for further experiments, knowledge exchange, and joint research in cooperative robotics. Expected developments include improvements in target detection and georeferencing, increased system autonomy, and the evaluation of cooperation strategies between drones and ground robots in more complex scenarios.

. Expected impacts include incorporating the knowledge gained into ongoing research, strengthening ties between UFRGS and the participating Swedish institutions, and creating opportunities for joint projects and publications. The outcomes of this experience therefore extend beyond the event itself, providing a foundation for continued international collaboration in artificial intelligence and robotics.

The process for follow-up will be the search for other source of funding to support longer periods of research stay for this students in 2027 (e.g. MSCA or CISB), as well as a continue remote collaboration aiming joint publications with the results of the experiments performed during this stay.

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