A distinguishing characteristic of Robot Planning is that it incorporates facets from many other fields in Engineering. This broad encapsulation, as well as the problem domain itself, arouses my interest the most. In particular, I am interested in robot planning, developing software for robotics simulation, designing and evaluating robot planning, and machine learning approaches for various tasks, including computer vision and statistical tasks.

As I am close to finishing my PhD study in Computer Science under the Reliable AI for Marine Robots (REMARO) project and I completed my master's degree in Computer Engineering with an emphasis on Artificial Intelligence and Robotics, it is my main goal to work in a more industrial-based and international environment in the robotics research field. I think I am well prepared for the challenges of working on an interdisciplinary project by assisting robots due to my extensive academic and practical background, which I will describe in detail below.

Courses:

My academic experiences thus far have provided me with a wide range of theoretical and practical knowledge and skills that will be immensely useful in working at a research level. As a Marie Skłodowska-Curie PhD candidate, I attended more than 7 summer and winter PhD schools in an elite and competitive environment with graduate students around European universities and marine institutions between 2021 and 2024. I have had different tasks and workshop training to improve my knowledge about marine robots and how to make underwater robots more reliable and robust. Courses included but were not limited to cognitive-enabled robot manipulation, advanced control, Modeling of Underwater Vehicles, Actuation Modalities and Control Architectures machine learning, knowledge, reasoning, planning, model-driven engineering, bug finding, model checking, reinforcement learning, self-adaptive systems, introduction to hybrid systems, and formal verification. In these PhD training schools, I had the opportunity to present my research work to multiple audiences from Academia and Industry which boosted my confidence in public speaking and presentation on a spectrum scale to experts in marine domain and robotics or professors at universities. During my Master's, I excelled in some courses related to machine learning, stochastic processes, numerical optimization, neural networks, and computer vision. It is worth noting I have a bachelor's degree in the major of Computer Engineering with an emphasis on Software with a strong mathematical background. I performed exceptionally in courses concerning calculus, statistics, and probabilistics during my bachelor's degree.

PhD:

During my PhD journey, I had this opportunity to expand my knowledge about robot planning, robot perception, and robot controls for marine robots. In my spare time, I worked and developed 3D robotic scenarios for pipeline inspection cases using physics-based simulators (like Gazebo and Blender) and utilizing ROS1 Noetic and ROS2 Humble. These practices and studies on automatic planning systems led me to work on designing a probabilistic planning framework for marine robots with the collaboration of other PhD students at the University of Bremen, the University of Oslo, and the R&D subsea Rosenxt research and technology group in Bremen. I could work on three accepted research papers, "Belief-based fault recovery for marine robotics",

“Reliable Plan Selection with Quantified Risk-Sensitivity”, and “Risk-averse Planning and Plan Assessment for Marine Robots”. The last research was accepted in IROS2024, the IEEE/RSJ International Conference on Intelligent Robots and Systems and I presented it in October 2024. I also extend my collaboration with the Machine Learning group at my host institution, the IT University of Copenhagen, where I worked on automating knowledge reasoning and scenario generation by synthesizing “MarineLLM-PDDL: Generation of Plans for Marine Vessels Using Past Incident Response Plans (IRPs)” using Large Language Models. These IRPs would be cruise reports written by expert leaders after real-world mission executions. We translate two new test-domain marine datasets from unstructured data.

Teaching Duties:

Moreover, I was fortunate to serve as a teaching assistant who saw my interest in some theoretical courses such as digital signal processing, signals, and systems, and also stochastic processes during my master's. During my PhD study, I was a teaching assistant for “The Advanced Programming course: Functional Programming: Scala” between 2021 and 2023. I had this opportunity to help students in solving their exercises or preparing exam materials along with course managers. Finally, I had the opportunity to supervise two undergraduate students during my Master’s and also wrote a funded proposal from the Ministry of Education in my country in 2018.

Work Experience:

In 2020 and 2021, I joined the Robotics Lab at my previous university's mechanical engineering department (Shahid Rajaee Teacher Training University, Tehran, Iran). I worked as a computer vision engineer and designed and developed the waste segregation robot’s vision. I utilized so many different machine learning approaches to handle this part of the project such as object detection, object tracking, transfer learning, working with industrial cameras, and communicating between control systems like step motors and vision-based software. Furthermore, I have some work experience with electrical engineers in our Lab to design and develop the control system. Besides doing research in the Lab, I have had the opportunity to publish three papers by doing research during my master’s. Between 2018 and 2020, I was a backend developer (Python developer) at a healthcare Startup at the University of Tehran in Tehran, Iran. I could develop and re-design our business scheme in Flask microservice and also deal with different types of databases, RDBMS, and NO SQL. I also spent my time developing RESTFUL APIs for cross-platform systems.

As these experiences demonstrate, I am highly motivated to learn new skills and experience unraveled things. This is precisely why I have decided to continue challenging myself by pursuing research-based positions or as a postdoctoral researcher in robotics at KTH.