

# Ahmed M. Ali

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## PERSONAL SUMMARY

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Participating in many national competitions and technical projects, I have built a versatile knowledge in the field of Robotics engineering in general and planning module in specific. Through these experiences, I have learned to master fundamental knowledge in path planning, convex optimization and robot control. As my master thesis, I am currently working on developing a new planner algorithm to estimate free space for mobile robots. I believe that my expertise and my current thesis topic guides me to be a solid candidate for your job offer.

## EDUCATION

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**Master of Science in Robotics and Computer Vision** Aug 2021 - Jun 2023

- Innopolis University, Russia
- Accumulative GPA: 4.83 / 5.00.
- Master thesis: “Incremental Free Space Estimation for Mobile Robots Using Convex Hulls”.

**Bachelor of Science in Mechanical Engineering** - Major: Mechatronics Aug 2016 - Jun 2021

- Nile University, Egypt.
- Accumulative GPA: 3.97 / 4.00. (High Honors)
- Bachelor thesis: “Designing and Control Optimization of Autonomous Mobile Industrial Robots”.

**Riga Technical University** – Riga, Latvia. Jan 2020 - Jun 2020

- Exchange student as part of Erasmus+ Program.

## WORK EXPERIENCE

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**Research Intern** – Innopolis University, Russia May 2022 – Aug 2022

- Performed a literature survey about state of the art methods of optimization based motion planners.
- Analyzed open source implementations written in C++ and used multiple software tools such as Docker.

**Summer Intern** – Sphinx glass Company, Egypt. July 2019

- Technical training for two weeks at a glass company.
- Took soft skills sessions along with technical tours inside the production lines.

## PROJECTS

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**Robot Navigation Using Reinforcement Learning** - Erudite War Oct 2022 – Dec 2022

- Implemented robot navigation using RL in a 2D static environment, which was created using OpenCV and OpenAI gym. [Demo](#)
- Build DDPG and TD3 models for continuous action space.

**VJM Analysis for 7DOF kuka on Linear Axis** - Innopolis University Jan 2022 – May 2022

- Implemented **Virtual Joint Matrix** analysis for Kuka kr-210 r-2700. [Demo](#)
- Applied **redundancy resolution** using three methods: Damped Least Square (DLS), Task Augmentation, Weighted Pseudoinverse.
- Enhance robot accuracy by geometric and elastostatic calibration.

## Human Eye Iris Center Detection - Innopolis University

Nov 2021

- Implemented **CNN** model according to the procedures of a published [paper](#) using PyTorch. [Demo](#).
- Applied multiple preprocessing steps such as: **dilation** and **gaussian** filters.

## Design and Control of a warehouse robot - Nile University

Aug 2020 – May 2021

- Implemented the ROS navigation stack including **Localization**, **Mapping**, and **Planning**. [Demo](#)
- Different algorithms were used: **AMCL**, **Hector SLAM**, **A\* star** algorithm, and **Dynamic window**.
- This was my bachelor thesis, supervised by **Valeo** company.

## Design and Manufacturing of E-car - EVER Competition

Mar 2019 – Oct 2019

- Led the electric section in the team representing Nile University the competition.
- Participated in the design and manufacturing phase of an electric rally car.
- Created the electric car simulation and **performance analysis** along with electric components sizing and car wiring using **Simulink**.

## PUBLICATIONS

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- Co-author: Ezzeldin, M. A., **Ali**, A. M., Mahmoud, J. A., Rabie, S. A., & Ammar, H. H. (2022). Impact of Charging on Battery Life and Battery Degradation in Electric Vehicles. In M. Alam, R. Pillai, & N. Murugesan (Ed.), Developing Charging Infrastructure and Technologies for Electric Vehicles (pp. 96-113). IGI Global. <https://doi.org/10.4018/978-1-7998-6858-3.ch005>

## HONORS AND ACHIEVEMENTS

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- Receiving full Innopolis University scholarship. 2021 – 2023
- Receiving Nile University Full Scholarship for academic merit. 2016 – 2021
- 1st place in Electric Vehicles Rally (EVER) 2020. Mar - Dec 2020
- Nile University Honor for high academic achievement. Dec 2019
- 1st place in Erudite War competition. June 2018
- 1st place in Robocombat category at Robogames competition. Nov 2017

## TECHNICAL SKILLS

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- Intermediate level in **Python** and **C++**.
- Experience with **ROS1**, **ROS2**, and **Gezebo** simulator.
- Knowledge of **Docker** containers and **Git** control system.
- Intermediate level in **Matlab** and **Simulink**.
- Experience with **supervised** and **unsupervised** ML models.
- Familiar with **Ubuntu** OS and **terminal** commands.
- Basic level in Autonomous Vehicle Control (using **Carla** Simulator).

## SOFT SKILLS

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- Fluency in English and Arabic.
- Good teamwork and communications skills.