

Abdelhakim Amer

Industrial PhD student at Aarhus University/EIVA
MSc. in Mechanical Engineering

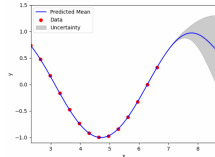
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SOCIAL LINKS

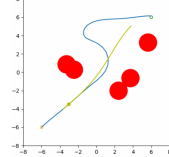
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PROFILE SUMMARY

I am passionate about robotics, autonomous systems, learning-based control, and field robotics for industrial applications. My research focuses on leveraging **machine learning** and **optimization** to improve robot trajectory tracking and enhance control, planning, and dynamics modeling in autonomous mobile robots. I'm driven by the challenge of advancing autonomous systems and bridging **theory** with practical solutions for **real-world applications**. My work includes:



Gaussian Processes



Model Predictive Control



Advanced Simulation

ACADEMICS

I hold a bachelor's in Mechanical Engineering (with High Honors), and a master's in High Tech Mechatronics Systems from Delft University of Technology, specializing in numerical methods, modeling, and control. I have been a visiting scholar at the German Center for Artificial Intelligence (DFKI). I am currently pursuing an Industrial PhD in learning-based optimal control at Aarhus University.



2022 - now

EIVA A/S, Denmark

PhD, Robotics and AI



2024 (1 month)

DFKI, Germany

Visiting Scholar, Underwater Robotics Research Group



2023 (1 month)

University of Paderborn,
Germany

Visiting Scholar, Automatic Control Research Group



2018 - 2021

Delft University of Technology,
The Netherlands

Master, Mechanical Engineering








2013 - 2018

The American University in
Cairo, Egypt

Bachelor, Mechanical Engineering (High Honors)

WORK EXPERIENCE

Prior to my PhD, I completed a 3-month internship at Royal IHC, where I worked on developing algorithms for path planning and control for autonomous shipping. After graduation, I spent a year at the AIR Lab at Aarhus University, working on an autonomous wind turbine inspection project in collaboration with Upteko, where I gained experience in software and hardware development for drones. I then began my industrial PhD at EIVA, where I am finalizing my research in learning-based optimal control, having developed novel methods for planning and control of autonomous underwater vehicles.

	2022 - 2025	EIVA A/S	PhD Researcher in Robotics and AI
	2021 - 2025	Aarhus University	Graduate Teaching Assistant in Control and Robotics
	2021 - 2022	Upteko Aps	R&D Engineer
	2021 - 2022	AIR Lab, Aarhus University	Research Assistant in Autonomous Systems
	2020 (3 months)	Royal IHC	Dynamics and Control Graduate Intern

PROGRAMMING EXPERIENCE

In recent years, I have primarily developed in Python and C++ for robotics applications, particularly in learning-based control and simulation. I have extensive experience with the ROS framework for integrating robotic systems. Additionally, I have worked with Unreal Engine for developing [high-fidelity simulations](#).



Python

★★★★★



C++

★★★★★



ROS

★★★★★



Unreal Engine

★★★★★



MATLAB

★★★★★



LaTeX

★★★★★



Shell Scripting

★★★★★

TEACHING AND SUPERVISION

As a Teaching Assistant at Aarhus University, I contributed to the following courses, providing support to students and assisting with course material:

- Autonomous Mobile Robots
- Control Theory

Additionally, I have supervised several Bachelor's and Master's theses, guiding students through projects in areas such as robot modelling and advanced control.



Fall 2024

MSc Thesis: Underwater Vehicle Modeling and Control using PINNs



Fall 2023

R&D Project: 3-D printing ship propeller cleaning ROV design



Spring 2023

BSc Thesis: Modeling and Control of a Seabed Visualizing ROTV using LQR





Fall 2022

BSc Project: Mini-Inspection Drone Design, Build and Control

AWARDS

I have received the following awards during my studies:

-  **Innovation Fund Denmark (1.3M DKK)** (2022-2025) - AI driven optimal control for underwater vehicles.
-  **Academic Excellence Scholarship** (2013-2018) – Awarded for outstanding academic performance.

PUBLICATIONS

The following list of publications represents the outcomes of my research from my Master's thesis to the present. Throughout my research projects, I have collaborated with researchers from various research institutions and companies across the world, including Denmark, Germany, Finland, China, and the USA.

1. **Amer, A.**, Falsegar, D., Brodskiy, Y., & Sarabakha, A. (2025). *Modelling of Underwater Vehicles using Physics-Informed Neural Networks with Control*. Submitted to the International Joint Conference on Neural Networks (IJCNN), under review.
2. **Amer, A.**, Mehndiratta, M., Brodskiy, Y., & Kayacan, E. (2025). *Empowering Autonomous Underwater Vehicles Using Learning-based Model Predictive Control With Dynamic Forgetting Gaussian Processes*. IEEE Transactions on Control Systems Technology.
3. Liang, W., **Amer, A.**, Mehndiratta, M., Chen, Z., Yao, B., & Kayacan, E. (2025). *Adaptive Robust Control Integrated With Gaussian Processes for Quadrotors: Enhanced Accuracy, Fault Tolerance and Anti-Disturbance*. IEEE Transactions on Systems, Man, and Cybernetics: Systems.
4. **Amer, A.**, Mehndiratta, M., Sejersen, J.L.F., Pham, H.X., & Kayacan, E. (2023). *Visual Tracking Nonlinear Model Predictive Control Method for Autonomous Wind Turbine Inspection*. 2023 21st International Conference on Advanced Robotics (ICAR), 431-438.
5. **Amer, A.**, Álvarez-Tuñón, O., Uğurlu, H.İ., Sejersen, J.L.F., Brodskiy, Y., & Kayacan, E. (2023). *UNav-Sim: A visually realistic underwater robotics simulator and synthetic data-generation framework*. 2023 21st International Conference on Advanced Robotics (ICAR), 570-576.
6. **Amer, A.**, Álvarez-Tuñón, O., Falsegar, D., Brodskiy, Y., & Kayacan, E. (2023). *MUDROV: A modular underwater defouling ROV for ship propeller cleaning*. Advanced Marine Robotics Workshop, International Conference on Intelligent Robots and Systems (IROS) 2023.
7. **Amer, A.** (2021). *Shape Optimization of a Flapping Wing for the Atalanta Project FWMAV* (Master's thesis). Delft University of Technology.

Best regards,
Abdelhakim Amer