

# Karim Asy

Assistant Lecturer

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Google Scholar: [scholar.google.com/citations?user=5iHwQr8AAAAJ](https://scholar.google.com/citations?user=5iHwQr8AAAAJ)

Robotics researcher specializing in manipulator design, intelligent control, and machine learning integration. Skilled in kinematic modeling, optimization, and AI-enhanced robotic systems. Actively pursuing PhD research opportunities in robot learning, control, and autonomous systems.

## Education

**MSc. in Mechatronics and Robotics Engineering**, Egypt-Japan University of Science and Technology (E-JUST) 02/2021 – 02/2024

- GPA: 3.51/4.00 (Grade A) | Full scholarship.
- Thesis: **Development of a 6-DOF Parallel Robot and Performance Analysis using Machine Learning.**
- Courses: Mobile Robotics & Vision Systems, Intelligent Control, Optimal Control, Adv. Robotics.

**BSc. in Production Engineering and Mechanical Design**, Menoufia University 09/2013 – 07/2018

- Graduated with Honors (**Top 2% of class**).
- Graduation Project: **Automated Guided Dump Truck**. Grade: Excellent.

## Research and Project Experience

**Founder & System Architect Multifunctional 6-Axis Manufacturing Platform** 06/2025 – Present

- Designing a 6-DOF robotic platform integrating ML-based inverse kinematics and digital twin simulation.
- Implementing modular end-effectors enabling hybrid manufacturing: SPIF, additive printing, and welding.
- Developing vision-based feedback control with adaptive learning for process optimization.

**Graduate Research Fellow | Hybrid 6-DOF Parallel Robot Design (MSc. Thesis)** 06/2022 – 02/2024

- Developed a hybrid sphericalparallel manipulator with precision positioning capability.
- Built MATLABSolidWorks model for inverse/forward kinematics and workspace analysis.
- Integrated ML regression and neural models (CNN, FFNN, RNN, Ensemble) for inverse kinematics; achieved less than 0.2% MSE.
- Designed a GUI for trajectory control, visualization, and workspace evaluation.

**Team Lead Automated Dump Truck Prototype (BSc Project)** 09/2017 – 07/2018

- Led a 6-member team to design and fabricate an AGV prototype with 9 kg payload capacity.
- Implemented control algorithms for navigation, load management, and obstacle detection.

## Publications

Asy, K., et al. (2023). *Conceptual Design and Kinematic Analysis of a Hybrid Parallel Robot for Accurate Position and Orientation*. **Proc. 62nd SICE Annual Conf.**, IEEE.

DOI: <https://ieeexplore.ieee.org/document/10354230>

**In Preparation:** Data-Driven MPC Enhanced Control for Multifunctional Manufacturing Robot. (Expected submission: Nov 2025)

## Language Proficiency

**IELTS Academic:** Overall **7.0** (Reading 7.5, Listening 7.5, Writing 6.0, Speaking 6.0) 09/2024

## **Research Interests**

**Current:** Robotic Manipulators, Kinematic/Dynamic Modelling, Intelligent and Optimal Control, Machine Learning for Robotics.

**Future:** Reinforcement Learning, Legged Locomotion, Aerial Robotics, HumanRobot Collaboration.

## **Teaching Experience**

**Assistant Lecturer Robotics Group, Menoufia University** 03/2024 – Present

- Courses: Robotics, Advanced Control, Mechatronic System Design, Computer Programming.
- Supervise undergraduate theses and oversee robotics lab instrumentation.

**Teaching Assistant Mechanical Design Group, Menoufia University** 12/2018 – 02/2021

- Courses: Mechanical Design, Theory of Machines, Automatic Control.
- Supported 90+ students in design and analysis labs; designed hands-on mechanical experiments.

## **Core Technical Skills**

**Robotics & Control:** ROS, Gazebo, MoveIt, MATLAB/Simulink, CoppeliaSim, PID/Adaptive/MPC Control, Kalman Filtering, Path Planning.

**Machine Learning & Programming:** MATLAB, Python (TensorFlow, Keras, Scikit-learn, OpenCV), C++, Embedded Systems (Arduino, Raspberry Pi).

**Design & Prototyping:** SolidWorks, Ansys, 3D Printing, CNC, Laser Cutting.

**Documentation:** LaTeX, Beamer, PowerPoint, Photoshop, Inkscape.

## **Leadership & Activities**

**Executive Board Member**, Graduate Student Association (E-JUST) 12/2022 – 01/2024  
Represented 150+ postgraduates from 10+ nationalities; contributed to policy and research events.

**Graduate Representative**, Mechatronics & Robotics Program (E-JUST) 10/2022 – 02/2024  
Facilitated communication between students and faculty on academic and research matters.

**Executive Coordinator**, Insider Menoufia University 2016 – 2017  
Co-led 112-member Journalism team; won *Best Initiative* and *Insider Cup* at the National Conference.

**Team Member**, FS Menoufia (Formula Student) 2015 – 2016  
Worked on suspension and steering system analysis; validated CAD damping design for improved dynamic control.

**Media Team**, Robotics Club Shebin 2014 – 2015  
Coordinated event logistics and media for university-level robotics competitions.

**Awards:** Graduate Distinction Award (2018), Ideal Student Award 2nd Place (2017)

## **Professional Memberships**

**Educational Quality & Accreditation Committee Member**, Menoufia University 05/2024 – Present  
Contribute to program accreditation through performance evaluation and quality assurance.

**Member**, Egyptian Engineers Syndicate (Mechanical Division) Since 09/2018