

AHMED MAGD ALY SHEHATA

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RESEARCH INTERESTS

My experience and research focus are on machine learning, especially in reinforcement learning, generative AI (e.g. diffusion models), and computer vision.

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

Aug 2021 - Aug 2023

M.Sc. in Robotics - Focused on AI and Computer Vision

CGPA: 4.05/4.30

Thesis: Exploring Diffusion Models for Semantic Segmentation in Bird's Eye View Mapping for Autonomous Vehicle Perception [\[Link\]](#)

Innopolis University — Transferred

Aug 2020 – June 2021

M.Sc. in Robotics and Computer Vision

CGPA: 4.67/5.00

Nile University

Aug 2016 - Aug 2020

B.Sc. in Mechatronics Engineering

CGPA: 3.98/4.00 (2nd/110 students)

Thesis: Intelligent EMG-Assisted Continuous Knee Motion [\[Link\]](#)

RESEARCH EXPERIENCE

Johns Hopkins University - Research Internship, Computer Science Department

April 2024 – Aug 2024

Advised by [Zongwei Zhou](#) at the [CCVL Lab](#)

Goal: Improving medical image analysis & synthesis using computer vision and generative models.

KAIST - Researcher, Computer Science Department

Jun 2023 - Mar 2024

Advised by [Sungjin Ahn](#) at the Machine Learning & Mind Lab. Contributed by:

- Developed RetNet WM: Enhanced S4WM's long-term memory by 2x, advancing model-based RL.
- Worked on fine-tuning diffusion models (based on Diffuser code) for improved RL task performance.

KAIST - Graduate Student Researcher, Robotics Department

Aug 2021 – Aug 2023

Advised by [Dongsuk Kum](#) at VDC Lab

Developed a generative diffusion model to create a semantic map of the surroundings of the ego-vehicle.

Nile University - Undergraduate Researcher

Jun 2019 – Jul 2020

Advised by [Hossam Hassan Ammar](#) at SESC Lab

Published three research paper in the intersection of robotics and machine learning.

WORK EXPERIENCE

PLAIF - Machine Learning and Robotics Engineer (Robot Learning)

Oct 2024 - Present

Roles:

- Implement reinforcement learning and imitation learning models on robotic manipulators in the real world to accomplish specific tasks for industrial clients
- Work closely with the vision and motion control teams to adjust the models and learning pipeline for better performance in real world deployment (e.g. working on domain adaptation problems and sim2real issues)

PUBLICATIONS

1. A. Bangunharcana, **A. Magd**, KS Kim. DualRefine: Self-Supervised Depth and Pose Estimation Through Iterative Epipolar Sampling and Refinement Toward Equilibrium. Conference on Computer Vision and Pattern Recognition (CVPR) 2023. [\[Link\]](#)
2. A. Sayed, AA Mohamed, **A. Magd**, et al. Experimental modeling of hexapod robot using artificial intelligence. In the International Conference on Artificial Intelligence and Computer Vision (AICV) 2020. [\[Link\]](#)
3. H. Elkholi, AT Azar, **A. Magd**, et al. Classifying Upper Limb Activities Using Deep Learning. In the International Conference on Artificial Intelligence and Computer Vision (AICV) 2020. [\[Link\]](#)
4. AT Azar, **AM Aly**, AS Sayed, et al. Neuro-Fuzzy System for 3-DOF Parallel Robot Manipulator. In Novel Intelligent and Leading Emerging Sciences Conference (NILES) 2019. [\[Link\]](#)

HONORS & AWARDS

Scholarships:

- M.Sc. Full scholarship recipient at KAIST 2021
- Full scholarship recipient at Inopolis University 2020
- Funding support from the Academy of Scientific Research and Technology (ASRT) in Egypt, for my graduation project. 2020
- Bank of Egypt full scholarship recipient for B.Sc. at Nile University 2016

Contests:

- **Finalist** in IDAO (International Data Analysis Olympiad, Yandex) Begemot's Team [\[Link\]](#) 2021
- **1st place** in deep learning contest (domain generalization) at Inopolis University. [\[Link\]](#) 2020

SKILLS

Programming Languages:	Python, C/C++, Java, MATLAB, HTML, CSS, JavaScript and React.js
Libraries:	PyTorch, TensorFlow, Keras, OpenCV, ROS
Development Environments:	Linux/Unix, Mac OS, and Windows.
Software (since undergrad):	LabVIEW, SolidWorks, Fusion360, ANSYS, MSC Adams, MAXIMA
Languages:	Arabic (Native), English (Advanced)

SELECTED PROJECTS & EXPERIENCE

For detailed projects and demos, visit my [GitHub page](#) and [website](#).

- **Fine-Tuning Diffusion Models using RL:** Fine-tuned Diffuser to perform better on RL tasks.
- **Diffusion Model for Autonomous Vehicles:** Developed a high-definition map prediction model for enhanced vehicle perception (Master's thesis).
- **Computer vision for Autonomous UAVs:** Developed classical computer vision algorithms for UAV localization and autonomous landing in harsh environments.
- **Reinforcement Learning:** Improved long-term memory in world models using RetNets with DreamerV2, tested on complex environments.
- **SAC Algorithm Tutorial:** Created comprehensive slides and a Colab project accessible [\[Link\]](#).

- **AI Sequence Models:** Worked with sequence models like Transformers, S4, and RetNet, and model-based RL including Dreamer and BLAST, tested on MiniGrid and DMC environments improving the SOTA performance of world models.
- **Classical Computer Vision Algorithms:** Developed algorithms for 360° image stitching and depth estimation.
- **Applied ML Tasks:** Trained models for lane segmentation, object detection, and neural machine translation.
- **Applied AI Algorithms:** Implemented and validated BLAST, SAC, PPO, YOLO, and many other known models for various tasks.
- **Regular AI Papers Review:** Regularly presented ML papers at KAIST, discussing cutting-edge topics like GFlowNets and MaskDiT.
- **Seminars and Reviews:** Regularly attended seminars with experts from KAIST, Google DeepMind, OpenAI, and MILA; and wrote extensive reviews of famous AI papers, some of which accessible [\[Link\]](#) and [\[Link\]](#).
- **AI Course Completion:** Completed over eight AI-related courses at KAIST and Innopolis University, supplemented by self-study from cs231n and DeepMind x UCL RL course.
- **Robotic Manipulator Simulation:** Simulated 6DOF KUKA robots using Python and MATLAB for motion control.
- **Convex Optimization for UAVs:** Created obstacle-avoidance path planning algorithms.
- **Competitions and Diplomas:** Competed in ACM programming contests and robotics competitions; attained a professional diploma from FESTO in robotics programming, control systems, and CNC operation.

UNDERGRADUATE PROJECTS ---

For demos, visit my [website](#).

- **Automated Vacuum Cleaner:** Built with PID motion control.
- **6DOF Robotic Arm:** Developed from scratch with a team during an Erasmus+ project.
- **SCARA Manipulator Control:** Applied PD, Feedback Linearization + PD, and Robust controls.
- **2048 Game:** Created using Python.
- **Potato Harvester Machine:** Designed using SolidWorks.
- **Stewart Platform Simulation:** Studied and simulated different motions using MSC Adams.
- **Video Encryption:** Implemented using MATLAB.

Freelancing

- Served consecutively as a judge at the Korea Science & Engineering Fair ([KSEF](#)) in 2022 and 2023, evaluating student projects in Computer Science, Engineering, Mathematics, Invention and Design, etc. Links: [2022](#), [2023](#).
- Designed a linear peristaltic pump operated with a non-standard four-stroke engine for FX GROUP (a startup group at Latvia) in 2019. [\[Link\]](#)
- Programmed a PLC to automate a production line for pipes in one of the factories in Egypt (2019).

Volunteering

- Head of scientific committee in “Building” club at MUST, where I used to help students in their courses by preparing detailed notes and solutions that they can get from the library.

MISC. ---

- Long-distance cycling (~150km), sightseeing, exercising, engaging in purposeful debates, and watching anime.