

# Turhan Can **KARGIN**

PHD STUDENT @ JAGIELLONIAN UNIVERSITY

Kraków, Poland

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“Live as if you were to die tomorrow. Learn as if you were to live forever.” - Mahatma Gandhi

## Summary

I graduated from the Department of Electrical and Electronics Engineering at Izmir Katip Çelebi University as the highest-ranked student of the department with a 3.57/4 GPA in 2020. I have attended the Erasmus+ Exchange Program in Poznan/Poland during my bachelor's degree. I studied at Poznan University of Technology in the third year, summer semester. Besides, I studied Business Administration at Anadolu University as a second bachelor's degree. Later, I got my Master's degree in Robotics at Poznan University of Technology and finished my education with a 4.7/5 GPA. Later, I worked as a Data Scientist at Poznan Supercomputing and Networking Center (PSNC). I am currently a PhD candidate at the Jagiellonian University in Kraków, Poland.

Electronics has attracted my attention throughout my life. Even when I was in secondary school, I was seeing myself in an electronic profession in the future. I met with artificial intelligence area with the machine learning lecture I took in the 4th grade of my bachelor's degree, and I decided to work in this field for my future career. When I searched for a place where artificial intelligence and electronics disciplines intersect, I thought that the field of robotics would be a very good choice for me. I love to code with Python and MATLAB. My hobbies include travelling to new places. I enjoy discovering different locations and always seize the opportunity to travel when I can. So far, I have visited 40 different countries. Additionally, I enjoy conducting research, designing better problem-solving methods for challenging tasks, and learning new technologies and tools as needed.

- You can check out my projects and more about me on my [LinkedIn profile](#) and [my portfolio website](#)

## Work Experience

### Group of Machine Learning Research (GMUM)

Krakow, Poland

PHD RESEARCHER

Oct. 2024 - Present

- Conducting novel research in building Smarter Visual Representations for Embodied Artificial Intelligence, aiming to improve Spatial Awareness.
- Designing computer vision pipelines for individual Lynx re-identification in partnership with the Wildlife Research Ecology Team from the Institute of Environmental Sciences.
- Working on semantic segmentation models to automate frog cell size estimation, streamlining analysis for the Life History Evolution Group from the Institute of Environmental Sciences.
- Coordinating GMUM's social media presence, promoting our group's research activities, and strengthening international visibility.

### Poznan Supercomputing and Networking Center (PSNC)

Poznan, Poland

DATA SCIENTIST

Mar. 2022 - Jan. 2025

- My role as a data scientist in this company is to apply my knowledge and skills in data science, machine learning, statistical modeling, and big data analytics to support the research, development and innovation projects of the company.
- I worked under ICT Energy Efficient Technologies Department.
- Anomaly Detection in the Energy Consumption based Time Series Data.
- Time Series Analysis and Forecasting.
- Simulation and Analysis of Various Renewable Energy System Setups.
- I worked on a replicable ML workflow for energy forecasting across multiple locations, which integrates with EMSs without requiring ML expertise. It uses historical time series data and can incorporate external variables for improved predictions.
- I also contributed to the Recommendation-based Heat Demand Response (HDR), a system to optimize building heat energy usage. Through a GUI, users can set energy consumption limits for specific periods. The HDR algorithm creates baseline consumption forecasts and, when limits are exceeded, recommends energy-saving measures like strategic temperature adjustments.

## University of Catania

Catania, Italy

ERASMUS INTERNSHIP

Mar. 2023 - Aug. 2023

- **Supervisor:** Prof. Giovanni Antonio MUSCATO and Dario Calogero Guastella.
- Working under the **Department of Electrical Engineering Electronics and Computer Science (DIEEI)** in **Robotic systems group (ROSys)**.
- His main task is to be involved improving the algorithm of Object Picking with Artificial Intelligence methods. He involved in the development of object detection and segmentation algorithms using AI frameworks, such as YOLO, Mask R-CNN and Principal Component Analysis (PCA).
- Participated in the design and implementation of robotic control strategies based on artificial intelligence, leveraging knowledge of ROS (Robot Operating System), control systems, and computer vision methods.
- Developed and tested algorithms in the Gazebo simulation environment.
- Gained practical experience working with various robotics environments, including mobile robots and robotic manipulators such as Universal Robots UR10e, AUBO i5 and Kuka youBot. Besides, he was part of the **BIOBLU** project.
- Used following frameworks during the internship: OpenCV, Roboflow, Tensorflow, Pytorch, Keras
- Applied the theoretical knowledge of robotics to real-life situations, which involved the control of a robotic manipulator.
- Worked on developing and fine-tuning classification algorithms, improving the accuracy and efficiency of the robotic system.
- Participated as a guest student in the university's robotics course, strengthening foundational knowledge and theoretical understanding of robotics.

## Silesian University of Technology

Gliwice, Poland

ERASMUS INTERNSHIP

Nov. 2020 - Mar. 2021

- **Supervisor:** Assistant Professor Michał Marczyk
- The internship lasted 13 weeks and each week the trainee had specific tasks in the project. The project subject of the intern is Methods of Clustering Single-Cell RNA Sequencing Data. The trainee has used R programming language to analyze single-cell RNA sequencing data. His tasks can be listed week by week as follows:
- Understanding the subject domain and defining the problems clearly. Literature and better practice search (visualization and clustering method search).
- Data understanding and checking selected methods (UMAP for visualization and dropClust for clustering). Data pre-processing (quality control, filtering cells and genes, normalization).
- Data visualization and dimensionality reduction. Applying clustering model and model evaluation.
- Tuning all parameters in data pre-processing, dimensionality reduction, and clustering to obtain a better cluster. Besides, comparing old and new clusters. Differential expression analysis to mark genes which allows us to assign biological meaning to each cluster.
- Applying the functional annotation method to find some biological annotations of these marker genes.
- Finally, we interpreted the results

## TESCOM UPS

Izmir, Turkey

MANDATORY INTERNSHIP AND GRADUATION PROJECT

Sep. 2019 - Sep. 2020

- My graduation project (High Power Efficiency Design Approach of an LLC Resonant Converter for UPS Battery Charger Application and Battery Charge-Discharge Regression Model) is supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under 2209B-Bachelor Final Thesis Focused on Industry Program. Industrial support for my work was provided by Tescom Elektronik A.Ş.
- **Additional information:** Besides, I was a production intern at Tescom UPS in 2018 summer for 2 months. I have worked on different sections of the manufacturing such as PCB Typesetting, Card Test, Cabling and Device Test.

## Deutz Service Group ASM

Izmir, Turkey

PART-TIME WORKING STUDENT ENGINEER

Dec. 2019 - Mar. 2020

- Worked on the project for industrial motor, automotive, machinery Ex-Proof products.

## ELPRO ENERGY

Izmir, Turkey

MANDATORY INTERNSHIP

Aug. 2019 - Seb. 2019

- Creating bill of quantity of projects, making market and price research for materials.
- Structure of Electrical Installation Design.
- AutoCAD.

## MASELMAK ENGINEERING

Ankara, Turkey

OPTIONAL INTERNSHIP

Jul. 2017 - Aug. 2017

- Electrical Panel Design (See Electrical)
- Tia Portal - PLC Software Design
- PLC Hardware Design

# Education

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## Jagiellonian University

Kraków, Poland

PH.D. IN TECHNICAL COMPUTER SCIENCE

Sep. 2024 - Present

- Current Research: Investigating methods to enhance the Spatial Awareness of Visual Representations in Self-Supervised Learning (SSL) for Embodied AI applications.
- Advised by Prof. Bartosz Zieliński, specializing in Computer Vision, Deep Learning, and Interpretable ML.
- Affiliated with the Doctoral School of Exact and Natural Sciences, Faculty of Mathematics and Computer Science.

## Politechnika Poznańska

Poznań, Poland

MASTER'S DEGREE OF AUTOMATIC CONTROL AND ROBOTICS

Feb. 2021 - Sep. 2022

- My advisor was dr hab. inż. Jakub Bernat, who works on Robotics and Reinforcement Learning.
- Specialization - Smart Aerospace and Autonomous Systems
- Awarded for the PUT Rector Scholarship twice
- 4,75/5 GPA
- Key Courses:
  - Fundamentals of Autonomous Systems
  - Adaptive Control
  - Basics of Smart Systems
  - Sensor Fusion
  - Microprocessors
  - Aerial Robots
  - Optimization Theory
  - Control of Flying Robots
  - Motion Planning in Robotics
  - Design of Multi-Agent Systems
  - Vision Based Control

## Izmir Katip Celebi University

Izmir, Turkey

BACHELOR'S DEGREE OF ELECTRICAL AND ELECTRONICS ENGINEERING

Sep. 2015 - Jul. 2020

- My advisor was Assoc. Prof. Şavaş Şahin, who works on Artificial Intelligence and Control Theory.
- Highest Ranked Student of the Department
- 3.57/4 GPA
- Key Courses:
  - Introduction to Algorithms
  - Machine Learning
  - Deep Learning
  - Image Processing
  - Microprocessors
  - Automatic Control
  - Industrial Automation
  - Introduction to Robotics
  - Process Control
  - VHDL and FPGA Design
  - Power Electronics
  - Logic Design
  - Signals And Systems

## Politechnika Poznańska

Poznań, Poland

ERASMUS+ PROGRAMME IN ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING DEPARTMENT

Feb. 2019 - Jul. 2019

- In the summer semester of my third year in IKCU, I participated in the Erasmus+ Education Exchange Program in Poland.
- My advisor was Dr. Eng. Jan Lamperski, who works on IT in the field of Telecommunications.
- Final Average Grade : 4,53 / 5
- Key Courses:
  - Digital Signal Processing
  - Optical Fiber Communication System
  - Telecommunication Network
  - Computer Network

## Anadolu University

Eskişehir, Turkey

BACHELOR'S DEGREE OF BUSINESS ADMINISTRATION

Sep. 2016 - Jul. 2020

- Second Degree in Economy and Business Area
- 2.96/4 GPA
- Certificate of Honour for the 2016-2017 school year

# Skills

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<b>Tools and Language Skills</b>	LaTeX, Git, Robot Operating System (ROS), Linux, Python, MATLAB, C++, R
<b>Organisational</b>	Machine Learning (scikit-learn), Deep Learning (Keras, PyTorch), Reinforcement Learning, Computer Vision, Robotic Control
<b>Job-related</b>	IEEE IKCU Board Member (Treasurer) (400+ Members), IEEE IKCU Power and Energy Society Vice Chairman (Community with 50 active members), GMUM Member
<b>Interpersonal</b>	Philomath, Fast Learner, Good Planner, Good at Producing Solutions Quickly, and Team Work Predisposition
<b>Languages</b>	Open-Minded, Tolerant, Good Listener, Open to Criticism
<b>Other Skills</b>	Turkish (Native), English (C1), German(B1), Polish(A2)
	Photography, Football, and Travelling

# Networks and Memberships

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2026	<b>Organization Team Member</b> , Machine Learning Summer School (MLSS) - link	<i>Krakow, Poland</i>
2025	<b>Volunteer</b> , Machine Learning Summer School (MLSS) - link	<i>Krakow, Poland</i>
2025-Now	<b>Volunteer</b> , Polish Artificial Intelligence Olympiad - link	<i>Krakow, Poland</i>
2022-2024	<b>Mentor</b> , Global AI Hub - link	<i>Whole World</i>
2021-2023	<b>Core Member</b> , Global AI Hub - link	<i>Whole World</i>
2022-2024	<b>Member</b> , GHOST (Group of Horribly Optimistic STatisticians) Science Club	<i>Poznan, Poland</i>
2022-2023	<b>Member</b> , CybAiR Science Club	<i>Poznan, Poland</i>
2015-2020	<b>Member</b> , The Chamber of Electrical Engineers (EMO) for Students	<i>Izmir, Turkey</i>
2017-2020	<b>Global Member</b> , IEEE	<i>Whole World</i>
2018-2020	<b>Global Member</b> , IEEE PES	<i>Whole World</i>
2018-2020	<b>Treasurer</b> , IEEE Izmir Katip Celebi University Student Society	<i>Izmir, Turkey</i>
2017-2018	<b>Vice Chairman</b> , IEEE IKCU Power and Energy Student Society	<i>Izmir, Turkey</i>

# Conferences and Publications

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## Workshop on World Models

*ICLR 2026*

SPARRTA: A SYNTHETIC BENCHMARK FOR EVALUATING SPATIAL INTELLIGENCE IN VISUAL FOUNDATION MODELS

*April. 2026*

- We introduce the Spatial Relation Recognition Task (SparRTa) benchmark, which evaluates the ability of VFMs to identify relative positions of objects in the image **Link to the publication**

## Archives of Control Sciences

*Polish Academy of Sciences*

REINFORCEMENT LEARNING-BASED OBSTACLE AVOIDANCE FOR CONTINUUM ROBOTS

*March. 2026*

- This work presents a reinforcement learning framework for controlling a planar three-section continuum robot in environments with static obstacles. **Link to the publication**

## Franklin Open Journal

*Elsevier*

DDPG-BASED REINFORCEMENT LEARNING FOR CONTROLLING A SPATIAL THREE-SECTION CONTINUUM ROBOT

*Feb. 2024*

- This paper proposes an approach to controlling a spatial three-section continuum robot using reinforcement learning algorithm. **Link to the publication**

## Journal of Intelligent and Robotic Systems

*Springer*

A REINFORCEMENT LEARNING APPROACH FOR CONTINUUM ROBOT CONTROL

*Oct. 2023*

- This work is derived from my Master's Thesis and was published in the "Journal of Intelligent and Robotic Systems, Springer Journal with a special section on Unmanned Systems". **Link to the publication**

## Robotics and Automation

*Applied Sciences*

COMPARISON OF VARIOUS REINFORCEMENT LEARNING ENVIRONMENT IN THE CONTEXT OF CONTINUUM ROBOT CONTROL

*April. 2023*

- This work is derived from my Master's Thesis and was published in the special issue "Motion Planning and Control for Automatic Machines, Robots and Multibody Systems". **Link to the publication**

## International Workshop on Energy-Efficient Data Centres

*Orlando, Florida, United States*

PLANNING DATA CENTER WASTE HEAT RE-USE IN A UNIVERSITY CAMPUS - A CASE STUDY AND SOFTWARE TOOLS

*June, 2023*

- During my time at PSNC, I worked on the **REnergetic** project, which was a part of the European Union initiative. As a team, we published a paper based on our findings. **Link to the publication**

- My graduation project (High Power Efficiency Design Approach of an LLC Resonant Converter for UPS Battery Charger Application and Battery Charge-Discharge Regression Model) was presented at International Balkan University International Conference Of Applied Sciences, Engineering And Mathematics (IBU-ICASEM 2020), June 4-6, Skopje/North Macedonia, Book of Abstracts, ISBN: 978-608-4868-02-6, 20, 2020 and Proceedings Book, ISBN 978-608-4868-06-4, 20, 2020. Besides, this work is supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under 2209B-Bachelor Final Thesis Focused on Industry Program with Project number 1139B411900874. **Link to the publication**

## Honors & Awards

2018	<b>Certificate of Honour</b> , Anadolu University	<i>Eskisehir, Turkey</i>
2019	<b>TUBITAK 2209-B</b> , I was eligible to participate in the 2209-B University Students Research Projects Support Program for Industry for my undergraduate thesis	<i>Izmir, Turkey</i>
2020	<b>Certificate of Outstanding Achievement - Highest Ranked Student of the Department</b> , Izmir Katip Celebi University	<i>Izmir, Turkey</i>
2022	<b>PUT Rector Scholarship</b> , Due to academic success in my master degree, I was awarded for the PUT rector scholarship for the 2nd and 3rd semester	<i>Poznan, Poland</i>
2025	<b>Best Project Award</b> , My team won the best project award at the Elias-Ellis-Vismac Winter School 2025 among 15 teams and nearly 100 participants. Our project title was Procedure Understanding with Vision-Language Models	<i>Brunico, Italy</i>

## Attended Academic Events

Nov, 2024	<b>Attendee</b> , ML in PL Conference 2024	<i>Warsaw, Poland</i>
Jan, 2025	<b>Attendee</b> , ELIAS-ELLIS-VISMAL Winter School 2025 - Best Project Award	<i>Brunico, Italy</i>
May, 2025	<b>Attendee</b> , GHOST Day: Applied Machine Learning Conference	<i>Poznań, Poland</i>
Jun, 2025	<b>Volunteer Organizer</b> , MLSSD 2025: Machine Learning Summer School on Drug and Materials Discovery	<i>Kraków, Poland</i>
Jul, 2025	<b>Attendee</b> , International Computer Vision Summer School (ICVSS) 2025	<i>Sicily, Italy</i>
Aug, 2025	<b>Poster Presentation</b> , ELLIS Doctoral Symposium on Robust AI - Probing the General Spatial Awareness of Vision Encoders	<i>Warsaw, Poland</i>
Oct, 2025	<b>Poster Presentation</b> , ML in PL Conference 2025 - Probing the General Spatial Awareness of Vision Encoders	<i>Warsaw, Poland</i>
Mar, 2026	<b>Poster Presentation</b> , Winter School on Foundation Models (FoMo) 2026 – SpaRRTa: A Synthetic Benchmark for Evaluating Spatial Intelligence in Visual Foundation Models	<i>Amsterdam, Netherlands</i>
Apr, 2026	<b>Poster Presentation</b> , Polish Conference on Artificial Intelligence (PP-RAI) 2026 - SpaRRTa: A Synthetic Benchmark for Evaluating Spatial Intelligence in Visual Foundation Models	<i>Kraków, Poland</i>
Apr, 2026	<b>Accepted Paper &amp; Poster Presentation</b> , ICLR 2026 Workshop on World Models - SpaRRTa: A Synthetic Benchmark for Evaluating Spatial Intelligence in Visual Foundation Models	<i>Rio de Janeiro, Brazil</i>
May, 2026	<b>Poster Presentation</b> , GHOST Day: Applied Machine Learning Conference - SpaRRTa: A Synthetic Benchmark for Evaluating Spatial Intelligence in Visual Foundation Models	<i>Poznan, Poland</i>

## References

### Dr. Hab. Bartosz Zieliński

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE, JAGIELLONIAN UNIVERSITY

- bartosz.zielinski@uj.edu.pl

*Kraków, Poland*

### Assoc. Prof. Savas Sahin

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING AT IZMIR KATIP CELEBI UNIVERSITY

- savas.sahin@ikc.edu.tr

*Izmir, Turkey*

### Dr. Eng. Jakub Kotota

FACULTY OF CONTROL, ROBOTICS AND ELECTRICAL ENGINEERING, POZNAŃ UNIVERSITY OF TECHNOLOGY

- jakub.kotota@put.poznan.pl

*Poznan, Poland*

### Prof. Giovanni Antonio MUSCATO

AUTOMATIC CONTROL AND ROBOTICS, DIEEI AT UNIVERSITY OF CATANIA

- giovanni.muscato@unict.it

*Catania, Italy*

## Writing

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I frequently publish articles and blogs in English and Turkish on various websites. My focus is on topics such as robotics, artificial intelligence, and emerging technologies.

### My Personal Blogs

WRITER

- <https://turhancankargin.com/>
- <https://turhancankargin.medium.com/>

### Other Websites

EDITOR

- *IoT Türkiye*
- *Data Science Earth*
- *WizzDev*

## Thesis

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As part of my application, I am pleased to provide links to my bachelor's and master's theses, which demonstrate my passion for academic study and my ability to conduct original research.

UNDERGRADUATE THESIS

- *High Power Efficiency Design Approach of a LLC Resonant Converter for UPS Battery Charger Application and Battery Charge – Discharge Regression Model*

MASTER'S THESIS

- *The Control of Soft Continuum Robot by Reinforcement Learning Algorithm*

'I agree to the processing of personal data provided in this document for realising the recruitment process pursuant to the Personal Data Protection Act of 10 May 2018 (Journal of Laws 2018, item 1000) and in agreement with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).'