

Bota Duisenbay

+39 3515754636 | bota.duisenbay@gmail.com | linkedin.com/in/botad | github.com/botastark

AI and Robotics Engineer with hands-on experience in both industry and research, with a focus on developing **AI**-driven end-to-end pipelines and implementing advanced control and manipulation strategies for **UAV** and **UR10** robotic platforms. Skilled in **Python/C++**, **ROS**, and **deep learning frameworks**. Inspired by the challenge of turning research ideas into real-world robotics and AI systems.

SELECTED WORK EXPERIENCE

Robotics Research Fellow <i>ISTC-CNR (Consiglio Nazionale delle Ricerche)</i>	Jan 2024 – Present
<ul style="list-style-type: none">UAV: Planned and executed outdoor drone missions, enabling autonomous navigation by integrating onboard computers (Jetson) with flight controllers (PX4). Developed services for real-time monitoring and control, establishing IP/TCP and UDP protocols for state feedback, camera streaming, and command transmission from an offboard computer.Path Planning: Studied and developed an information-gain-based path planning method for mapping, leveraging real aerial imagery from drones to optimize autonomous navigation and improve efficiency of field monitoring. Accepted at IAS-19 (oral presentation).Peer Review Contributions: Co-reviewed submissions for <i>Communications Engineering</i> (Nature) and <i>Artificial Life Journal</i> (MIT Press), focusing on drone swarm technologies and collective learning methods.Industrial Collaboration: Facilitated technical coordination with industry partners, including supporting technical exchanges with UVify for drone operations, and contributing to preliminary discussions with Leonardo regarding swarm research collaboration.	<i>Rome, Italy</i>
Artificial Intelligence Engineer <i>Botshelf.ai</i>	Sept 2022 – Sept 2023
<ul style="list-style-type: none">Document Segmentation: trained classification and layout analysis models for document types of varying format, and segmentation model for images with a cluttered background and overlapping document pages.Key Information Extraction: experimented with OCR (MS Azure, GCP, Paddle) and LLM to extract required fields for unstructured (83%) and structured documents (98%). Redesigned the pipeline, boosting from 67% to 89% by proposing and training end2end three models that leveraged image crop, spatial position and the text.License Plate: collected and curated open source datasets of European plates and trained YOLOv5 for detection in cluttered environments and recognition for license number with 98% and 96.5% accuracy respectively.	<i>Rome, Italy</i>
AI and Robotics Intern <i>Baker Hughes</i>	Nov 2020 – Jul 2021
<ul style="list-style-type: none">Optical Character Recognition (OCR) for the engraved character on a metal: collected and annotated relevant data set, performed image processing, implemented state-of-the-art OCR algorithms and fine-tuned available open source libraries to achieve 91% accuracy;Industrial robot arm UR10: developed a simulation of the task and motion planning of the UR10 robot to perform grip and placement of objects.	<i>Florence, Italy</i>
Robotics Research Assistant <i>Robotics lab, Nazarbayev University</i>	Jun 2017 – May 2018
<ul style="list-style-type: none">Robotics pick and place: built ROS based control of the UR10 robotic manipulator with a mounted anthropomorphic hand grippers and localised grasp affordance from 3D Kinect Image;Hand prosthesis: developed a finger position control algorithm for several grasp types using Arduino and Simulink. Implemented tele-operation using gloves with flex sensors;Permanent Magnet Synchronous Motor (PMSM) control: implemented the Direct-Torque control method together with the Maximum Torque Per Ampere technique for PMSM using MATLAB/Simulink. Presented the resulting paper at ELEKTRO 2018 IEEE conference DOI:10.1109/ELEKTRO.2018.8398286.	<i>Astana, Kazakhstan</i>

EDUCATION

MSc Artificial Intelligence and Robotics <i>La Sapienza University of Rome ("Don't miss your chance" full merit-based scholarship)</i>	July 2023
Selected coursework: Neuroengineering, Computer Vision, Reinforcement Learning, Cloud Computing	<i>Rome, Italy</i>
BSc Robotics and Mechatronics <i>Nazarbayev University (State full merit-based scholarship)</i>	June 2018
Selected coursework: Embedded Systems, Power Electronics, Robotic System Design	<i>Astana, Kazakhstan</i>

TECHNICAL SKILLS

Programming: Python, C/C++

AI/ML: TensorFlow, PyTorch, AWS (S3, SageMaker), CI/CD

Robotics: ROS, Gazebo, MATLAB, Simulink

Hardware: UR10, PX4, NVIDIA Jetson, Kinect, Arduino

PUBLICATIONS

Duisenbay, B., Ognibene, D., Toscano, P., Boschetti, M., Berton, A., & Trianni, V. (in press). Information gain-based informative path planning for UAVs in agriculture: Towards field deployment. In **Proceedings of the 19th International Conference on Intelligent Autonomous Systems (IAS-19)** (June 30–July 4, 2025), Genoa, Italy.

Nurtay, B., **Duisenbay, B.**, & Do, T. D. (2018, May). Direct-torque control system design using maximum torque per ampere method for interior permanent magnet synchronous motors. In **Proceedings of the 12th International Conference ELEKTRO 2018** (May 21–23, 2018), Mikulov, Czech Republic. IEEE. (ISBN 978-1-5386-4760-8)