MoniJesu W. James
Curriculum Vitae

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- MoniJesu James

RESEARCH INTERESTS

- Robotics Perception and Planning

- Heterogeneous Robot teams

- Multi-agent collaboration: cooperative exploration, task allocation, and Decision-Making

- Semantic Spatial Perception and reasoning for Embodied Agents

- Integration of classical robotics algorithms with foundation language models (LLM, VLM) for semantically-aware autonomy

RESEARCH EXPERIENCE

CURRENT, FROM NOV 2024

Intelligent Space Robotics Lab
Graduate Student Researcher

- Implemented Particle Filter based localization for Eurobot 2025 autonomous mobile robot competition, fusing data from LiDAR, wheel odometry, and camera, achieving an accuracy of 2cm.

- Transformer based 3D reconstruction from multiview camera and Monocular camera based SLAM for drone warehouse navigation.

- SpatialVLM, Spatial reasoning and Semantic Perception for drone navigation

- Traversability and open Vocabulary segmentation for UAV-UGV heterogeneous robot navigation

- Heterogenous Multi-Robot Semantic Navigation using Semantic mapping and Vision Language Models

Don State Technical University
Undergraduate Thesis

- Developed a mobile robot for navigation in urban conditions

- Implemented Simultaneous Localization and Mapping based on 2D LiDAR

- Implemented Extended Kalman Filter and Particle Filter based Localization with prior

- Implemented A* for global path planning and Timed Elastic Band (TED) for Local planner

- Hands on Experience with Single-board computers, Microcontrollers, 2D LiDARs, Wheel odometry, inertial measurement unit (IMU), ROS and ROS Navigation Stack.

EDUCATION

2024 – PRESENT	**MSc Engineering Systems (Robotics)** CUMULATIVE GPA: 3.93/4.0 (CURRENT) Center for Digital Engineering *Skolkovo Institute of Science and Technology*
2020 – 2024	**Bachelor of Mechatronics and Robotics** CUMULATIVE GPA: 3.94/4.0 Department of Robotics and Mechatronics *Don State Technical University, Russia*

AWARDS AND SCHOLARSHIPS

OCTOBER, 2025	**Audience Award, Skoltech Triple Point Startup Competition** *Skolkovo Institute of Science and Technology*
MAY, 2025	**Scholarship for Development, Champions** *Skolkovo Institute of Science and Technology*
2025	**Champions, Eurobot Open, Russia** *Eurobot Russia*
2024	**Full Master's degree Scholarship** *Skolkovo Institute of Science and Technology*
2021	**2nd position, Russian language olympiad (All-Russian level)** *Southern Federal University*
2021	**2nd position, Russian language olympiad (Intra-university level)** *Don State Technical University*
2019	**Full Undergraduate BEA Scholarship (Russia)** *Nigerian Federal Scholarship Board*

TECHNICAL SKILLS

Programming & Algorithms
Proficient: Python, MATLAB
Experienced: C++, Bash, OpenCV
Familiar: YOLO, C, C#, LaTeX

Systems & Frameworks
Proficient: ROS 1/2, RVIZ, Simulink, SOLIDWORKS, KOMPAS-3D
Experienced: Ardupilot, Gazebo/Ignition, Siemen NX
Familiar: Pybullet, Nvidia Isaac Sim, Webots, Unity

PROFESSIONAL EXPERIENCE

AUGUST 2025, FROM MAY 2025 (PT)

Waybot Robotics
Robotics Software Engineer - Intern

- Implemented 3D-LiDAR based SLAM for ground based professional cleaning robot.

- Reviewed Several state-of-the-art methods for 3D LiDAR based SLAM for mobile robots

- Tested several methods based on real robot data, updating parameters for different situations based on accuracy and speed.

- Implemented localization on prior for previously constructed maps.

- Gained hands-on experience on algorithms like ICP, NDT, GICP, VGICP and other 3D SLAM, point cloud matching algorithms

JUNE 2025 – JULY 2025 (FT)

Autonomous Tech
Intern Engineer

- Developed a full functioning custom Quadcopter - Mechanical assemblies, electronics, firmware installations, and testing.

- Integrated Oranpi Pi one-board computer for high level control using ROS2 and Mavproxy protocols

- Tested the drone with ultrasonic sensor, determining the right position for the sensors to avoid disturbance by the turbulence of the propellers.

- Successfully tested the system, achieving an accuracy of 80%

JUNE 2023 – JULY 2023 (FT)

Mikom Servis
Intern Engineer

- Designed, developed, and tested an autonomous ground robot.

- Implemented and tested YOLO for road signs detection and a Raspberry Pi and ROS-based Hector SLAM for mapping and localization in unknown environments.

SERVICE AND LEADERSHIP

JUNE 2022 - JUNE 2024

Students for Christ, Russia (DSTU chapter)
Home group leader

I led a group of students, coordinating weekly meetings to foster a supportive community and spiritual growth.

NOVEMBER 2023 - MAY 2024

Robotics and Mechatronics Department, DSTU
Departmental Representative

I Participated in several exhibitions as a Robotics and Mechatronics Department representative to showcase robots to prospective students. I engaged and interacted with prospective students, addressed there queries about the robotics program in the university and demonstrated various robots from our department and their functionalities

Hardware & Sensors
Proficient: Arduino, ESP32, Raspberry Pi, Nvidia Jetson nano, RPLiDAR
Experienced: Orange Pi, Intel Realsense, Livox MID360 LiDAR
Familiar: Intel NUC, STM 32

DevOps & Tools
Proficient: Linux, Git, SSH
Experienced: Docker, VNC

OTHER PROJECTS

"Virtual Impedance for drone formation maintenance and Obstacle Avoidance"

The project simulates a drone swarm using PyBullet, it features virtual impedance control for formation maintenance and obstacle avoidance. A leader drone follows a circular trajectory, while followers maintain a V-shaped formation.

"PID, LQR, MPC and RL for Cart-pole problem"

This project demonstrates several control strategies applied to the classic Cart-Pole balancing problem. Each approach is implemented in a separate file using PID and Cascade PID Control, Linear Quadratic Regulator (LQR), Model Predictive Control (MPC) and Reinforcement Learning (RL).

"Design and analysis of a Formula student Impact Attenuator"

This project focused on the design and analysis of an impact attenuator as part of a project on the design and analysis of a cockpit system for a formula student racing car. Tasks include: Material Selection, 3D Modeling using Siemens NX, and Impact analysis using Abaqus Explicit.

PUBLICATIONS

Abdelrahman Metwally, **Monijesu James**, Alexey Fedoseev, Miguel Altamirano Cabrera, Dzmitry Tsetserukou, Andrey Somov. (2025). *Hybrid F and ROS 2 Architecture for Vision-Based Autonomous Flight: Design and Experimental Validation.* *IEEE ICIT26*, (Under review):

REFERENCES

Dzmitry Tsetserukou

POSITION   Associate Professor

EMPLOYER   Center for Digital Engineering
Skolkovo Institute of Science and Technology

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Clement Fortin

POSITION   Full Professor, Dean of Education

EMPLOYER   Center for Digital Engineering
Skolkovo Institute of Science and Technology

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Lavrentjev Evgeniy Borishovich

POSITION   Senior Lecturer

EMPLOYER   Robotics and Mechatronics Department
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