

Vincenzo Polizzi

Italian citizen currently living in Toronto, Canada

✉ polivicio@gmail.com 🔗 polivi.iobii.com in vincenzo-polizzi 🌐 viciopoli01 📧 polivicio 🏠 Vincezo Polizzi

Summary of Qualifications

PhD student in Aerospace Science and Engineering specializing in Computer Vision for robotics, with extensive research and development experience. Proven track record of leading innovative projects, including multi-UAV collaborative systems and 3D feature point descriptor modeling. Skilled in SLAM, thermal-inertial odometry, event cameras, and localization systems, with expertise reflected in peer-reviewed publications.

Education

University of Toronto Ph.D. in Aerospace Science and Engineering supervised by Prof. Kelly	2023 Ongoing
• Current GPA: 4.0/4.0	Toronto, CA
Swiss Federal Institute of Technology ETH Zurich M.Sc. in Robotics, Systems and Control	2019 2022
• GPA: 5.43/6.0	Zurich, CH
Politecnico di Milano Bachelor Degree in Automation Engineering	2016 2019
• GPA: 110/110	Milan, IT

Publications

FaVoR: Features via Voxel Rendering for Camera Relocalization 🔗 , IEEE/CVF WACV	Feb 2025
V. Polizzi , M. Cannici, D. Scaramuzza, J. Kelly - arxiv.org/pdf/2409.07571 🔗	Tucson, USA
Data-Efficient Collaborative Decentralized Thermal-Inertial Odometry 🔗 , IEEE RA-L, IROS	Oct 2022
V. Polizzi , R. Hewitt, J. Hidalgo-Carrió, J. Delaune, D. Scaramuzza - 10.1109/LRA.2022.3194675 🔗	Kyoto, JP

Skills

Languages: C++ (Udacity nanodegree and industry experience), Python and CUDA (academic experience)
Hardware: Visual/thermal/event cameras, NVIDIA embedded platforms Jetson, Arduino UNO, Raspberry Pi
Technologies: ROS, Docker

Industry Experience

IniVation AG , Software Engineer Intern	Aug 2022 - Aug 2023
• Integrated an event-based Visual Inertial Odometry (VIO) frontend with a third-party backend	Zurich, CH
• Extended the camera-IMU calibration framework to support additional camera models	
• Conducted research and trained feature extraction neural networks for event-based images	
Rheinmetall Air Defence , Robotics Engineer Intern	Aug 2022 - Aug 2023
• Developed software infrastructure for an autonomous drone used in inspection, airport security, and surveillance applications	Zurich, CH

Academic Experience

University of Toronto , Teaching Assistant - Computer Vision for Robotics (ROB501)	Fall 2023, Fall 2024
• Worked with Prof. Steven Waslander (2023) and Prof. Jonathan Kelly (2024)	Toronto, CA
• Delivered lectures on event, thermal, and depth cameras to a class of 70 students	
University of Zurich , Research Assistant - Robotics and Perception Group	Aug 2022 - Aug 2023
• Worked on robust SLAM in challenging scenarios using learned inertia	Zurich, CH
• Explored advanced SLAM techniques, including neural radiance fields and diffusion models	
ETH Zurich , Laboratory Technician - Institute of Dynamic Systems and Control	Aug 2022 - Aug 2023
• Contributed to the development and implementation of the next generation of Duckiedrones in Prof. Fazzoli's group. Featured on " People of Duckietown " 🔗 .	Zurich, CH

NASA JPL Aerial Mobility group (347T) , Visiting Research Student at NASA (JPL)	May 2021 - Nov 2021 Pasadena, USA
<ul style="list-style-type: none"> Developed the first collaborative thermal-inertial odometry system for UAVs in the opensource JPL xVIO framework The system could be used for other NASA missions such as CADRE 	
ETH Zurich , Teaching Assistant - Institute of Dynamic Systems and Control	Aug 2022 - Aug 2023 Zurich, CH
<ul style="list-style-type: none"> Delivered tutorials to a class of 30 students on Docker, AR/VR, and Reinforcement Learning Contributed to the MOOC version of the course on edX, attended by over 4,000 participants, by designing control systems exercises 	

Projects

HARMEDA , Computatinal Imaging, University of Toronto, Prof. Lindell	Fall 2024 Toronto, CA
<ul style="list-style-type: none"> Developed a system that mimics the human vision system by inducing a motion pattern to an event camera to improve data association, tracking, and image reconstruction 	
Visual Odometry with semantic cues ↗ , Vision Algorithms for Mobile Robots, ETH Zurich	Fall 2020 Zurich, CH
<ul style="list-style-type: none"> Implemented a Visual Odometry Algorithm leveraging semantic segmentation to exclude moving objects from feature tracking and improve feature matching 	
Memory Card , Visualization, Simulation and Interaction - Virtual Reality I, ETH Zurich, Prof. Kunz	Win 2020 Zurich, CH
<ul style="list-style-type: none"> Developed a Mixed Reality application for iOS and Android to play the Memory card game 	
Semantic Place Recognition for Multi-Robot Applications , Semester Project in the Vision for Robotics Lab at ETH, supervised by Prof. Chli	Win 2020 Zurich, CH
<ul style="list-style-type: none"> Demonstrated how semantic descriptors enhance feature matching for loop closure under wide view changes in UAV systems 	
Duckietown Parking Area ↗ , Autonomous Mobility on demand: from car to fleet, ETH Zurich	Fall 2019 Zurich, CH
<ul style="list-style-type: none"> Participated in the limited-seat course "Autonomous Mobility on Demand: From Car to Fleet" at ETH Zurich (30 students) Contributed to the parking area team, developing solutions for a Duckiebot (3-wheeled car prototype) to park autonomously 	
Monumenta ↗	2016 Canicatti', IT
<ul style="list-style-type: none"> Developed an augmented reality app that serves as a city guide for tourists, offering tailored suggestions for organizing their journeys Collaborated with six municipalities through cultural associations to promote Sicily's archaeological and natural heritage 	
PoliAssembly ↗ , Computer Science class, Politecnico di Milano, Prof. Braga	Fall 2016 Milan, IT
<ul style="list-style-type: none"> Created a pseudo-assembly interpreter to demonstrate how registers and memory function during program execution Used as a teaching tool in computer science classes at Politecnico di Milano, used by more than 150 students 	
RomeCup , Fondazione Mondo Digitale	Feb 2016 Rome, IT
<ul style="list-style-type: none"> Designed and built a robot to detect sound, light, and gas sources in an unknown environment Achieved 3rd place and was the only participant to successfully identify sound sources 	

Awards and Competitions

Essay Competition Award ↗ , ICVSS 2022 by University of Cambridge and University of Catania	Jul 2022 Scicli, IT
<ul style="list-style-type: none"> Awarded the Best Essay Prize at the ICVSS 2022 Summer School "<i>The societal impact of AI, its dual-use, and peacebuilding capabilities: Discussed from a research and innovation perspective as part of a global research community.</i>" 	
OpenCV AI Competition 2021 Phase 1 Finalists ↗ , OpenCV - Microsoft Azure - intel	2021 Zurich, CH
<ul style="list-style-type: none"> Integrated OAK-D depth camera with on-edge computing in the Duckietown platform to enable research in Autonomous Driving Cars educational products 	
Scholarship Ida Beltrami	2018

<ul style="list-style-type: none"> Selected as one of six recipients from a competitive pool of applicants through a rigorous selection process for outstanding academic performance 	Milan, IT
Scholarship Cassa Forense	2018 to 2020 Milan, IT
<ul style="list-style-type: none"> Recognized for outstanding academic performance while having parents working in the forensics field 	
The Best Freshmen Students	2016 Milan, IT
<ul style="list-style-type: none"> Awarded for exceptional academic achievements during the first year of the bachelors degree and potential in the academic career 	
Chess championships	2009 to 2013 Agrigento, IT
<ul style="list-style-type: none"> Competed at the national and regional levels, ranked 1st for five consecutive years in the Agrigento province, Sicily, Italy 	
Math Olympic Games , Bocconi University	
<ul style="list-style-type: none"> Participated in the national round, demonstrating strong problem-solving and analytical skills, ranked in the top 5 in the regional round 	

Extracurricular courses and activities

Montreal Robotics Summer School , Mila	Jun 2024 Montreal, CA
<ul style="list-style-type: none"> Program featured presentations by leading academics and industry professionals from UdeM, Mila, McGill, Polytechnique Montréal, and Facebook Led a team of three to train a legged robot for autonomous navigation on diverse terrains and unknown environments without collisions 	
International Computer Vision Summer School (ICVSS) ↗ , University of Cambridge and Catania	Jun 2022 Scicli, IT
<ul style="list-style-type: none"> Completed a comprehensive course covering the latest research in Computer Vision, Machine Learning, and Artificial Intelligence 	
Google Developers Student Club (GDSC) Zurich , ETH Zurich	2022 Zurich, CH
<ul style="list-style-type: none"> Organized the event "Look Back in Time with NASA James Webb Space Telescope," attended by over 116 students Collaborated with Dr. Giuseppe Cataldo from NASA's Goddard Space Flight Center to provide valuable insights on space exploration and the James Webb Space Telescope 	
Getting Started with DeepStream for Video Analytics on Jetson Nano ↗ , NVIDIA DLI	2020 Zurich, CH
<ul style="list-style-type: none"> Gained hands-on experience with DeepStream plugins and architecture for video analytics on the Jetson Nano platform 	
Getting Started with AI on Jetson Nano ↗ , NVIDIA DLI	2020 Zurich, CH
<ul style="list-style-type: none"> Gained practical knowledge in AI application development with Jetson technology 	
Summer School "The Human Being Behind the Man: The Cyborg" , Torrescalla - Fondazione RUI	2018 Vienna, AT
<ul style="list-style-type: none"> Engaged in discussions on the role of cyborg technology in society and its potential impacts on human evolution and equity 	
PEoPLe@DEIB - ML for geophysical data interpretation , Politecnico di Milano	2028 Milan, IT
<ul style="list-style-type: none"> Gained an overview of analyzing geophysical data using machine learning algorithms 	
IT Consultant of the Mayor ↗ , Municipality of Burgio	2017 - 2018 Burgio, IT
<ul style="list-style-type: none"> Developed an app to connect the city council with citizens, promoting participatory democracy 	
JUMP (Job-University Matching Project) ↗ , Student Residence Torrescalla - Fondazione RUI	2016 to 2019 Milan, IT
<ul style="list-style-type: none"> Focused on enhancing technical knowledge with essential skills such as ethics, global mindset, and public speaking to develop well-rounded professionals with a strong understanding of both technical and soft skills 	