Vincenzo Messina

Space Engineer. Research Associate at the Technical University of Munich (TUM).
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EDUCATION

Arizona State University (ASU) 08/2025 – 12/2025
Visiting Scholar at the Ira A. Fulton Schools of Engineering
Research on Distributed Satellite Systems for Monsoon Monitoring
Advisor: Dr. Paul Grogan

Technical University of Munich (TUM) 09/2022 – Present
PhD in Aerospace and Geodesy, Chair of Spacecraft Systems
Thesis (working title): "Collaborative Satellite Network: A cooperative method for optimizing decentralized satellite operations"
Advisor: Prof. Dr. Alessandro Golkar

Politecnico di Milano (PoliMi) 09/2019 – 09/2021
Master's in Space Engineering
Grade: 110/110

University of Southampton 01/2021 – 08/2021
Exchange Semester in M.Sc. Space Systems Engineering
Master's Thesis: "Design of a propellant delivery system for porous electrospray thrusters" in collaboration with the University of Illinois Urbana-Champaign

Politecnico di Torino (PoliTo) 09/2016 – 07/2019
Bachelor's in Aerospace Engineering
Young Talents Project: selective (top 5%) program for talented students.
ASP winter school: "The Fourth Industrial Revolution"

PUBLICATIONS

Journal Publications

1. S. Scrocciolani, **V. Messina**, R. M. García Alarcia, J. Sindermann, A. Golkar, "Advancing Satellite Network Performance: Network Analysis for Federated Satellite Systems", *IEEE Access*, 12, 2024.

Conference Publications

1. **V.Messina**, M. Camporeale, R. Vingerhoeds, and A. Golkar. 2026. The Role of Central Nodes in Multi-Task Allocation for Distributed Space-Based Observation Systems. In Appears at the International Workshop on Autonomous Agents and Multi-Agent Systems for Space Applications (MASSpace-26). Held as part of the Workshops at the 25th International Conference on Autonomous Agents and Multiagent Systems., Paphos, Cyprus, May 2026, IFAAMAS.
2. **V. Messina**, A. Golkar, "Efficient and Responsive Task Allocation in Distributed Satellite Systems: The Role of Central Nodes", *Fourteenth International Workshop on Planning & Scheduling for Space (IWPSS)*, 2025.
3. **V. Messina**, A. Golkar, "Advancing Federated Satellite Systems Performance: A Collaborative Method for Improved Object Detection in Space", *AIAA SCITECH 2025 Forum*, 2025, pp. 0588.
4. **V. Messina**, A. Golkar. "Latency optimization in Centralized and Decentralized Coordination of Time-Varying Evolutionary Satellite Networks: The Impact of packet size", *75th International Astronautical Congress*, 2024.
5. L. Schuberth, **V. Messina**, et al. "Leveraging event-based cameras for enhanced space situational awareness: a nanosatellite mission architecture study", *75th International Astronautical Congress*, 2024.
6. M. Kura, **V. Messina** et al, "Tradespace Analysis and Conceptual Design for a Lunar Navigation and Communication Constellation", *75th International Astronautical Congress*, 2024.
7. L. Kessler, **V. Messina**, A. Golkar, "Advancing Digital Twin implementation for CubeSats: Integrating theoretical insights with real-world applications", *75th International Astronautical Congress*, 2024.
8. A. Monibas, **V. Messina**, A. Golkar, "Orbital Manoeuvring Optimization Techniques for Collision Avoidance through Decentralized Algorithms", *75th International Astronautical Congress*, 2024.
9. **V. Messina**, A. Golkar, "Initial formulation of a time varying dynamic graph decentralized optimization framework for scaled satellite network infrastructure operations", *74th International Astronautical Congress*, 2023.

10. Strasser, F., **V. Messina**, A. Golkar et al, "Schedule Optimization for a Heterogeneous Earth Observation Satellite Constellation"*, 74th International Astronautical Congress*, 2023.
11. C. Ma, **V. Messina**, et al, "Plume study of an electrospray thruster using a HAN-based dual-mode ionic liquid propellant," in *Proceedings of the 37th International Electric Propulsion Conference*, 2022.
12. Ma, C., **V. Messina** et al. "Emission characterization of porous electrospray thrusters with actively controlled flow rate," in *Proceedings of the 37th International Electric Propulsion Conference*, 2022.
13. **V. Messina**, et al. "Performance evaluation of A40N hybrid thruster using green propellants for space applications", *8th edition of the 3AF International Conference on Space Propulsion,* 2022.

WORK EXPERIENCE

Technical University of Munich (TUM), Research Associate (Munich, Germany) 09/2022 – Present

- Teaching theoretical and practical-based courses in a series of topics regarding space engineering and systems engineering, and supervising master's and bachelor's students' theses.
- Conducting research to develop novel algorithms and methodologies for optimizing the operations and coordination of a decentralized federation of autonomous satellites, enabling them to achieve collective objectives while maintaining independent operation, with consideration of the limited computational capabilities and resources available on board.
- Identifying research funding calls, writing proposals, publishing papers, presenting in conferences, and writing a PhD thesis dissertation, among other research tasks.

Technical University of Munich (TUM) Asia, Lecturer of Space Mission Design (Singapore) 09/2026

University of Southampton, Research Technician in Chemical Propulsion 12/2021 – 05/2022

- Research Topic: Design, manufacturing and testing of a 50N hybrid thruster using High-Test Peroxide, as oxidizer, and paraffin or high-density polyethylene, as fuel.

TEACHING

Spacecraft Design - Fundamentals, Instructor, Grader Summer 2023 & 2024 & 2025

Space Mission Design, Instructor, Grader Winter 2023 & 2024

Introduction to Spaceflight, Instructor, Grader Winter & Summer 2024

Systems Engineering – Fundamentals, Teaching Assistant, Grader Winter & Summer 2024

Spacecraft Operations, Teaching Assistant Winter 2023

Space Systems Seminar, Teaching Assistant, Grader Summer 2023 & 2024

PROJECTS & CERTIFICATIONS

EventSat CubeSat Mission, Design Lead for ADCS and Thermal Control 2023 - Present

- Serve as design lead for the attitude determination and control subsystem and thermal control subsystem for a 6U CubeSat Mission for object detection in space using Event Cameras. Supporting the project management.

ESA Academy's Online Space Debris Training Course 2021 05/2021

Introductory Certificate in Project Management, IPMA Italy 2021

SKILLS

Programming, Design and Analysis: Python, MATLAB, C, SolidWorks, Simulink, STK, GMAT, LabView, NASA CEARUN, ESA MASTER, ESA DRAMA

Languages: Italian (Native), English (C1), Spanish (B2), German (B1), Sicilian (Native)

Other: Type B European Driving License

HONORS

Project Management Championship Italy 2021, Winning Team	2021
Young Talent Recognition, Politecnico di Torino	2019

VOLUNTEERING

TUM Science Hackathon 2023, Moderator of the Autonomous Spacecraft Challenge	2023
Space Day 2024, Supporting Team	2024
Space Day 2025, Supporting Team	2025