Max Spolaor, Ph.D.

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Clearance Status

- TS/SCI with C.I. polygraph. Adjudicated on 4/29/2021.

Education

Doctor of Philosophy in Astrophysics 2010
Centre for Astrophysics and Supercomputing, Swinburne University of Technology, Australia

- Developed data-intensive, high-performance simulations and advanced statistical tools (i.e., artificial intelligence/machine learning) for modeling complex astrophysical processes.
- Awarded the Faculty of Information Technologies Research Thesis Excellence Award.
- Awarded the Charlene Heisler Prize for the most outstanding Ph.D. thesis in Australia.

Bachelor of Science (Honors), Physics and Physical Technologies 2005
Department of Physics, University of Trieste, Italy

Professional Experience

Senior Project Engineer - Technical Program Management Office
The Aerospace Corporation 12/2024 - present

- Led the Missions & Ecosystems and Demonstration Infrastructure focus areas of the NASA-sponsored Consortium for Space Mobility and ISAM Capabilities (ISAM: In-Space Servicing, Assembly, and Manufacturing. COSMIC: cosmicspace.org). Developed their mission, vision, and strategy. Contributed to the development of several ISAM-related technical products.
- Engaged in partnership development and customer relations to advance ISAM research and development, prioritize the expansion of scalable ISAM capabilities, and promote collaborations across US-based companies, universities, and government agencies (NASA, DoD, IC).

Senior Engineering Specialist - Data Science/Big Data Mining and Artificial Intelligence
The Aerospace Corporation 10/2020 - 11/2024

- Provided innovative AI/ML, data science, software and systems engineering technical contributions and project management direction to 40+ interdisciplinary projects across multiple Aerospace's customers (i.e., DoD, IC, NASA) and departments.
- Contributed technical and strategic leadership for the ETG's General Managers, VP, and OCTO in designing, road-mapping, and building community and corporate efforts on the topics of: MLOps, MLSecOps, TrustedAI, Digital Fluency, Generative AI, AI at the Edge, and Autonomy.
- Supervised and mentored 40+ junior and mid-level engineers across 10+ different Aerospace departments.
- Elected chair of the Space ISAC AI/ML Community of Interest. Authored and coordinated the development of two MLSecOps-related papers at the intersection of AI and Cyber for space systems.
- Conceptualized the idea of an end-to-end V&V testbed for autonomous systems. Designed the software architecture and cloud computing infrastructure. Led the tehcnical development from "on paper" stage to final deployment and usage of the V&V testbed.

Professional Experience (continued)

Chief Scientist (01/2019 - 10/2020) **and Senior Systems Engineer** 03/2017 - 10/2020
NASA Independent Verification & Validation (IV&V), Fairmont, WV - TMC Technologies

- Designed, built, and delivered software applications using AI/ML techniques to improve hardware-in-the-loop and software-only modeling & simulation capabilities for mission assurance of spacecraft hardware and software.

- Managed and led the development of AI-enabled applications for advanced data-driven V&V testing of mission-critical spacecraft flight software, hardware, and sensors.

- Delivered an experimental AI-enabled application, deployed on a CubeSat, capable of real-time anomaly detection and autonomous command and control operations of a spacecraft's sensor.

- Contributed to the flight software (http://www.stf1.com/NOS3Website/Nos3MainTab.php) and hardware development of the NASA Simulation-to-Flight 1 (STF-1) CubeSat (http://stf1.com/).

Software Engineer III 04/2014 - 02/2017
National Radio Astronomy Observatory (NRAO), Karl G. Jansky Very Large Array, Socorro NM

- Maintained and enhanced 500,000 lines of Java, C/C++, and CUDA code used to operate and correlate large amount of data of the world's most powerful array of radio-telescope antennas.

- Utilized object-oriented and parallel programming techniques to develop code that allowed the autonomous operation of multiple sub-arrays of antennas in parallel.

- Implemented GPU-accelerated statistical software solutions for real-time monitoring and analysis of large amount of engineering and scientific data (e.g., GBps telemetry data stream).

UCLA/NASA Airborne Remote Sensing Postdoctoral Scholar 08/2011 - 04/2014
University of California Los Angeles, Department of Atmospheric and Oceanic Sciences
NASA Airborne Science Program, Armstrong Flight Research Center, Edwards Air Force Base

- Developed ground and flight software for operating autonomous remote sensing payloads of the NASA Global Hawk unmanned aerial vehicle and the NSF C-130 Hercules aircraft.

- Designed data-science-based tools for performance monitoring and real-time troubleshooting of data acquisition and processing software via satellite link.

- Created statistics-driven space physics simulations to detect and predict anomalies of mission-critical software for remote sensing payloads.

- Led software support during ground, launch, and post-mission operational phases: U.S. Air Force CONUS/OCONUS base deployments; 100+ flights, 1000+ flight hours.

Instrument Scientist and Research Fellow 06/2010 - 08/2011
Australian Astronomical Observatory, Australia

- Managed software and engineering operations of ground-based remote sensing instrumentation.

- Optimized C++ algorithms for signal processing, target detection, and big-data visualization.

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Technical Expertise

- **Aerospace:** Core Flight Software (NASA-cFS); NASA Operational Simulation for Small Satellites (NOS3); NASA OpenSatKit; SLS, ICPS and PSP flight software; SpaceX Autonomous Flight Termination System flight software (AFTS); AIT, COSMOS, and AWS ground stations; CubeSat development and operations (STF-1); NASA 42 spacecraft attitude and orbital dynamic simulator; RTOS and RTEMS fundamentals.
- **Programming Languages:** C, C++, Python, Java.
- **AI and Big-Data:** Numpy, Pandas, SciKit-Learn, TensorFlow, Keras, PyTorch, CUDA-GPU, databases (SQL, NoSQL, Vector), MLOps, MLSecOps, Docker, Kubernetes, traditional Machine Learning, Deep Learning and Reinforced Learning, Time Series Data Analysis and Anomaly Detection, Generative AI technologies (e.g., RAG, LLMs, LangChain, LangGraph) and Agentic AI (e.g., OpenAI Agents SDK, MCP, AutoGen).
- **Others:** Project management; software test and evaluation; remote sensing instrumentation development; research and development; research paper and grant-writing.

Verbal and Written Communication Skills

- Presented 100+ lectures to multi-disciplinary audiences, including project stakeholder meetings.
- Authored 100+ scientific documents, including: progress and technical reports; software technical documentation; scientific publications in international journals including Nature and Science.

Honors and Awards

- The Aerospace Corporation, PRP Award, 2025
- The Aerospace Corporation, Civil Systems Group Award, 2024
- The Aerospace Corporation, Aerospace Patent Invention Award, 2024
- The Aerospace Corporation, PRP Award, 2023
- The Aerospace Corporation, Team Achievement Award - Team AI Sandbox, 2023
- Adjunct Professor - West Virginia University, Department of Physics & Astronomy, 2022 - present
- The Aerospace Corporation, PRP Award, 2022
- The Aerospace Corporation, SPOT Award, 2021
- NASA IV&V Project Achievement Award, 2019
- NASA IV&V Excellence in Leadership Award, 2018
- NASA IV&V Excellence in Values Award, 2018
- NASA IV&V Project Achievement Award, 2018
- NASA Group Achievement Award, 2016
- Charlene Heisler Prize. Astronomical Society of Australia, 2011
- FICT Research Thesis Excellence Award. Swinburne University of Technology, 2009