Jean-Baptiste Bouvier

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Work Experience

Jan 2024	**Postdoctoral Scholar,** ICON Lab at UC Berkeley ○ Trained generative AI using diffusion transformers for robot trajectories in **PyTorch** and on hardware robots (DDAT). Published at RSS 2025. ○ Mentoring 3 PhD students on safe RL, LLM curriculum learning, and multi-agent diffusion.
June 2023 Dec 2023	**Postdoctoral Research Associate,** ICON Lab at University of Illinois Urbana-Champaign (UIUC) ○ Safe RL (POLICEd RL) implemented with DDPG, DDQN, TD3, PPO in **PyTorch**. Published at RSS 2024. ○ Mentored 1 PhD student working on safe RL and optimal robotic assembly planning.
May 2023 Aug 2019	**Research Assistant,** Control and Autonomy Lab at UIUC ○ Lyapunov stability of a model-based policy in **PyTorch**. ○ Resilience of autonomous systems enduring loss of control in **MATLAB**. ○ Teaching Assistant for the Structures and Control Lab and the Aerospace Dynamical Systems class.
July 2021 Dec 2021	**PhD Intern in Optimization and Control,** at Pacific Northwest National Laboratory ○ Guaranteed distributed transient safety of electrical networks in **Julia**.
Feb 2019 July 2019	**Intern in Flight Dynamics,** at CNES: French Space Agency ○ Contributed to a high fidelity satellite constellation simulator in **C++**.
Aug 2017 Dec 2018	**Research Assistant,** Space System and Optimization Lab at UIUC ○ Optimized low-thrust low-energy interplanetary trajectories in **MATLAB**.

Education

May 2023	**Ph.D. in Aerospace Engineering,** University of Illinois Urbana-Champaign Thesis: Guaranteed Resilience of Autonomous Systems to Loss of Control Authority over Actuators
Dec 2018	**Masters of Science in Aerospace Engineering,** University of Illinois Urbana-Champaign Thesis: Orbit Control for a Spacecraft around a Splitting Contact Binary Asteroid
June 2017	**Masters of Science in Aerospace Engineering,** ISAE-Supaéro, France

Latest Publications

2025	**JB. Bouvier**, K. Ryu, K. Nagpal, Q. Liao, K. Sreenath, N. Mehr. DDAT: Diffusion Policies Enforcing Dynamically Admissible Robot Trajectories. *Robotics: Science and Systems* (RSS), 2025.
2024	**JB. Bouvier**, K. Nagpal, N. Mehr. POLICEd RL: Learning closed-loop robot control policies with provable satisfaction of hard constraints. *Robotics: Science and Systems* (RSS), 2024
	JB. Bouvier, K. Nagpal, N. Mehr. Learning to provably satisfy high relative degree constraints for black-box systems. *63rd IEEE Conference on Decision and Control* (CDC), 2024.

Proposals

2025	**NSF Cyber-Physical Systems (CPS)** CPS-Small: Provable Enforcement of Hard Constraints in Reinforcement Learning-Based Controllers for Safety-Critical CPS. Funded at $600K.
2025	**IRB Protocol** Robotic Trajectory Planning in Environments Shared by Humans
2024	**Google - BAIR program** DAD: Dynamics Aware Diffusion for admissible robot trajectories. Funded at $25K.

Skills

General:	Machine Learning, Control, Optimization, Robotics
Programming:	Python (PyTorch, Numpy, SciPy, Matplotlib), ROS, Julia, MATLAB, LaTeX.