

Julia Ebert

Software Engineer · Robotics Researcher · Boston, MA

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Skills

Computer Science

Algorithm development · C++ · Python · Linux · Docker · Robot Operating System (ROS) · Git/version control · ZMQ · Protobuf · MATLAB · JavaScript · HTML/CSS

Engineering

Computer-aided design (OnShape) · 3D printing · Basic PCB design · Laser cutting

Experience

Boston, MA
2023 –

Fleet Robotics

Autonomy Lead

- › Architect and implement the software system from the ground up, including hardware selection, communication protocols (ZMQ, protobuf), DevOps (Docker, CI/CD pipeline), and user interface development, enabling Fleet's first on-ship robot demonstrations.
- › Manage a team of three software engineers and supervise high school through PhD student interns.
- › Design and implement robot control systems, safety mechanisms, and a robust logging system.
- › Develop robust path planning and execution systems for autonomous underwater navigation on 3D curved steel surfaces, addressing challenges of limited sensing and harsh operating conditions.
- › Lead software project planning, collaborating with product management and executives to align goals, manage timelines, and mitigate risks.

Brighton, CO
2022 – 2023

Outrider

Software Engineer, Mission Planning (Remote)

- › Spearheaded design and development (C++, ROS) of new multi-robot planning for Outrider's of autonomous distribution yard trucks.
- › Led cross-functional project teams to create new robot behaviors toward product goals.
- › Supported test site and customer deployments of the mission planning system.

Cambridge, MA
2016 – 2022

Harvard University Self-Organizing Systems Research Group, Prof. Radhika Nagpal

Doctoral Researcher

- › Developed collective spatial decision-making algorithms for simulated and physical robot collectives. Includes bio-inspired and Bayesian decision and movement algorithms.
- › Created open-source Kilosim (C++) to simulate hundreds of robots at up to 1000x real time.
- › Collaborated with MIT Media Lab to create heterogeneous robot swarm for inspection on space stations, including algorithm development and hardware testing in microgravity (Zero-G flights).
- › Supervised undergraduate and masters student research projects, and taught robotics and digital fabrication courses.

Livermore, CA
Summer 2018

Lawrence Livermore National Laboratory, Dr. Michael Schneider

Computational Science Research Intern

- › Programmed, refactored, and documented research codebase (Python) for space situational awareness (SSA), since used extensively by researchers at LLNL and in review for JOSS publication.
- › Developed a simulator and visualization tools (Python) for orbit observation by low earth orbit satellites.

Education

Cambridge, MA
2022

Harvard University

PhD in Computer Science

- › Thesis: *Distributed Decision-making for Inspection by Autonomous Robot Collectives*
- › Department of Energy Computation Science Graduate Fellow (DOE CSGF) · Siebel Scholar

London, UK
2016

Imperial College London

Master of Research (MRes) in Bioengineering, with Distinction

- › Marshall Scholar · Thesis: *Assisting Balance Recovery with a Lower Limb Exoskeleton*

Boston, MA
2015

Northeastern University

BS in Behavioral Neuroscience, Minor in Computer Science

Select Publications

J Ebert et al. (2022) A Hybrid PSO Algorithm for Multi-robot Target Search and Decision Awareness. *IROS 2022*. [🔗](#)

J Ebert et al. (2020) Bayes Bots: Collective Bayesian Decision-Making in Decentralized Robot Swarms. *ICRA 2020*. [🔗](#)

J Ebert et al. (2018) Multi-feature collective decision making in robot swarms. *AAMAS 2018*. [🔗](#)