Julia Ebert

Software Engineer • Robotics Researcher • Boston, MA

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Experience

Golden, CO
2022 –

Outrider
Software Engineer, Mission Planning (Remote)
- Implement mission planning software (C++, ROS) for autonomous trucks in a distribution yard.
- Develop algorithms for single- and multi-vehicle truck missions.

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 SSA, since used extensively by SSA researchers at LLNL.
- Developed a simulator and visualization tools (Python) for orbit observation by low earth orbit satellites.

London, UK
2015 – 2016

Imperial College Human Robotics Group, Prof. Etienne Burdet and Dr. Ildar Farkhatdinov
Post-graduate Research Assistant
- Developed algorithms for human-robot co-control of the LOPES exoskeleton in standing a walking balance recovery. Tested with human participants and modeled in Simulink.

Skills

Computer Science
Algorithm development • Python • C/C++ (including embedded programming and Arduino) • Robot Operating System (ROS) • Linux • Git/version control • MATLAB • JavaScript

Engineering
Computer-aided design (OnShape) • Electronics design (Eagle) • 3D printing • Laser cutting

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

Interests & Activities

Outreach
NPR *Brains On* podcast guest • FIRST Lego League judge • Harvard *Science in the News* public lecture

Personal
Curling (Harvard club curling team) • Web design & development • Open source 3D print models

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*.

I Farkhatdinov, **J Ebert** et al. (2019) Assisting Human Balance in Standing with a Robotic Exoskeleton. *IEEE RA-L*.

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