



Julia Ebert

PhD Candidate • Robotics Researcher

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Education

Cambridge, MA 2016 – 2019	Harvard University <ul style="list-style-type: none">› PhD Candidate in Computer Science› MS in Computer Science Advisor: Prof. Radhika Nagpal
London, UK 2016	Imperial College London <ul style="list-style-type: none">› Master of Research in Bioengineering, with Distinction Marshall Scholar Advisors: Prof. Etienne Burdet, Dr. Ildar Farkhatdinov Thesis: <i>Assisting Balance Recovery with a Lower Limb Exoskeleton</i>
Boston, MA 2015	Northeastern University <ul style="list-style-type: none">› BS in Behavioral Neuroscience, Minor in Computer Science GPA: 3.98, summa cum laude Honors Thesis: <i>Asymmetric Learning in an Asymmetric Bimanual Task</i>

Peer-Reviewed Publications

- J Ebert**, M Gauci, F Mallmann-Trenn, and R Nagpal. 2020. Bayes Bots: Collective Bayesian Decision-Making in Decentralized Robot Swarms. In *2020 IEEE International Conference on Robotics and Automation (ICRA)*, 7186–7192. [🔗](#)
- I Farkhatdinov, **J Ebert**, G van Oort, M Vlutters, E van Asseldonk, and E Burdet. 2019. Assisting Human Balance in Standing with a Robotic Exoskeleton. *IEEE Robotics and Automation Letters*, 4, 2, 414–421. [🔗](#)
- J Ebert**, M Gauci, and R Nagpal. 2018. Multi-feature collective decision making in robot swarms. In *Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems*, 1711–1719. Stockholm, Sweden. [🔗](#)
- S Bazzi, **J Ebert**, N Hogan, and D Sternad. 2018. Stability and Predictability in Dynamically Complex Physical Interactions. In *2018 IEEE International Conference on Robotics and Automation (ICRA)*, 5540–5545. [🔗](#)
- S Bazzi, **J Ebert**, N Hogan, and D Sternad. 2018. Stability and predictability in human control of complex objects. *Chaos*, 28, 10. [🔗](#)

Grants and Scholarships

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| 2020 – 2021 | Siebel Scholar, Class of 2021 🔗 |
| 2016 – 2020 | Department of Energy Computational Science Graduate Fellowship (DOE CSGF) 🔗 |
| 2015 – 2016 | Marshall Scholarship 🔗 |
| 2014 | Northeastern Provost Undergraduate Advanced Research Award |
| 2013 – 2015 | Barry Goldwater Scholarship |
| 2013 | Northeastern Provost Undergraduate Research Award |
| 2013 | DAAD Undergraduate Scholarship |
| 2013 | Northeastern Presidential Global Scholarship |

Awards

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| 2018 | Certificate of Distinction in Teaching, Harvard University Bok Center 🔗 |
| 2016 | Finalist, Hertz Fellowship 🔗 |
| 2016 | Honorable Mention, National Science Foundation Graduate Research Fellowship Program (NSF GRFP) 🔗 |

- 2015 Northeastern Honors in Behavioral Neuroscience (for thesis) [🔗](#)
- 2015 Northeastern University Honors Program Distinction (for coursework) [🔗](#)
- 2015 Northeastern Alex Skavenski Award for Behavioral Neuroscience
- 2015 Northeastern Sears B. Condit Award for academic achievement
- 2010 – 2015 Northeastern Dean's List (6 semesters) [🔗](#)
- 2015 Finalist; Rhodes, Fulbright, and Mitchell Scholarships

Research

Cambridge, MA	Harvard University Self-Organizing Systems Research Group Prof. Radhika Nagpal
2016 –	<ul style="list-style-type: none"> › Perception and decision making in robot collectives <i>Developing a framework for collective spatial decision-making in both simulation and physical robot platforms, including developing a parallelized, high-throughput robot simulator.</i>
2017 –	<ul style="list-style-type: none"> › LARVAbot: Locomotion of autonomous robots via aggregation <i>Designing and manufacturing a collective of 3D-printed robots to perform aggregate locomotion, inspired by the movement of sawfly larvae.</i>
Livermore, CA	Lawrence Livermore National Laboratory Dr. Michael Schneider
2018 –	<ul style="list-style-type: none"> › Collaborative Autonomy for Space Situational Awareness <i>Designing multi-agent algorithms for orbit tracking and maneuver detection with satellite constellations.</i>
May – Aug. 2018	<ul style="list-style-type: none"> › Internship: Simulating Space Situational Awareness <i>Developed a simulator for testing collective orbit observation by low earth orbit satellite constellations.</i>
London, UK	Imperial College Human Robotics Group Prof. Etienne Burdet and Dr. Ildar Farkhatdinov
2015 – 2016	<ul style="list-style-type: none"> › Co-control of balance recovery in a lower limb exoskeleton <i>Developed algorithms for human-robot co-control of the LOPES exoskeleton in both standing a walking balance recovery, and tested with human participants.</i>
Boston, MA	Northeastern University Action Lab Prof. Dagmar Sternad
2014 – 2015	<ul style="list-style-type: none"> › Prediction and stability in control of objects with complex dynamics <i>Programmed HapticMaster robot (C++) for human-subject experiments and conducted pilot experiments.</i>
2012 – 2015	<ul style="list-style-type: none"> › Learning and long-term retention of an asymmetric bimanual task <i>Designed and programmed experiments to assess ability of humans to learn a motor task with rhythmic and discrete components. Conducted multi-month data collection (including with EEG) and analysed results (Matlab) for Honors thesis.</i>
2011 – 2012	<ul style="list-style-type: none"> › Effects of central fatigue on cognitive and motor performance <i>Analyzed data (Matlab) to assess the effect of a prolonged motor experiment on cognitive fatigue in human subjects.</i>
Nahant, MA	Northeastern University Marine Science Center Prof. Joseph Ayers
May – Aug. 2015	<ul style="list-style-type: none"> › Neuro-inspired rheotaxis and antenna design in a robotic lobster <i>Contributed to development of flex-sensing antennae for lobster-inspired robot. Developed neuron-based biomimetic control (LabView) for using antennae to adjust robot control in response to water currents.</i>
Watertown, MA	Interactive Motion Technologies
July – Sept. 2014	<ul style="list-style-type: none"> › Integrated stroke assessment software in rehabilitation robotics <i>Developed a backend and interface (Python + Django) for integrating clinical stroke assesment tools into a rehabilitation robot.</i>
Tübingen, DE	Max Planck Institute for Intelligent Systems Prof. Stefan Schaal
July – Dec. 2013	<ul style="list-style-type: none"> › Learning and exploration in a novel dimensionality-reduction task <i>Designed a learning task in which subjects learned to map high-dimensional hand joint movements to move a 2D cursor, and conducted pilot experiments.</i>

Conference Abstracts and Posters

- J Ebert**, M Gauci, and R Nagpal. 2019. Bayes Bots: Bayesian Decision-Making for Robot Swarms. Poster at *DOE CSGF Program Review* (14–18 July 2019). Washington, DC. [↗](#)
- J Ebert**, J Meyers, W Dawson, and M Schneider. 2018. Collaborative Autonomy for Space Situational Awareness. Poster at *Lawrence Livermore National Laboratory Summer Student Poster Symposium* (8 August 2018). Livermore, CA. [↗](#)
- J Ebert**, M Gauci, and R Nagpal. 2018. Multi-Feature Collective Decision Making in Robot Swarms. Poster at *DOE CSGF Program Review* (15–19 July 2018). Washington, DC. [↗](#)
- J Ebert**, C Teeple, E Steinhardt, and S Ramanathan. 2017. Infotaxis in a Multi-agent Sensor Network. Poster at *DOE CSGF Program Review* (24–27 July 2017). Washington, DC. [↗](#)
- I Farkhatdinov, **J Ebert**, G van Oort, E van Asseldonk, and E Burdet. 2017. Human Balance Augmentation with Lower Limb Exoskeleton Robot. Poster at *RehabWeek 2017 workshop: Towards a next generation of wearable robotic devices for human-oriented assistance and therapy* (17 July 2017). London, UK.
- J Ebert**, I Farkhatdinov, G van Oort, E van Asseldonk, and E Burdet. 2016. Preliminary Study on Assisting Balance Recovery with Lower Limb Exoskeleton. Poster at *EuroHaptics 2016* (4–7 July 2016). London, UK. [↗](#)
- D Sternad, A Mukovskiy, **J Ebert**, and T Dijkstra. 2016. Dynamic Stability in the Control of Complex Objects. Poster at *Biomechanics and Neural Control of Movement 2016* (12–17 June 2016). Mt. Sterling, OH.
- J Ebert**, S Park, and D Sternad. 2015. Asymmetric Learning in an Asymmetric Bimanual Task. Poster at *Society for the Neural Control of Movement 25th Annual Meeting* (20–24 April 2015). Charleston, SC. [↗](#)
- J Ebert**, A Mukovskiy, T Dijkstra, and D Sternad. 2015. Why You Don't Spill Your Coffee. Poster at *Northeastern University Research, Innovation, and Scholarship Expo (RISE)* (9 April 2015). Boston, MA.
- J Ebert**, S Kim, D Sternad, and S Schaal. 2014. Learning and exploration in a novel dimensionality-reduction task. Poster at *Society for the Neural Control of Movement 24th Annual Meeting* (20–25 April 2014). Amsterdam, NL. [↗](#)
- J Ebert**, S Park, and D Sternad. 2014. Asymmetric Learning in an Asymmetric Bimanual Task. Poster at *Northeastern University Research, Innovation, and Scholarship Expo (RISE)* (10 April 2014). Boston, MA. [↗](#)
- J Ebert**, S Park, and D Sternad. 2013. Asymmetric Learning in an Asymmetric Bimanual Task. Poster at *Northeast Undergraduate Research and Development Symposium* (2–3 March 2013). Biddeford, ME. [↗](#)
- J Ebert**, S Park, L Griffen, T O'Neil Pirozzi, and D Sternad. 2012. Central Fatigue in Cognitive and Motor Performance. Poster at *Northeastern University Research, Innovation, and Scholarship Expo (RISE)* (29 March 2012). Boston, MA. [↗](#)

Teaching and Mentoring

Cambridge, MA	Harvard University
Summer 2019	› REU mentor for Kilobot research and outreach project
Fall 2018, Fall 2019	› Teaching staff , How To Make (Almost) Anything, Harvard section
Fall 2018, Fall 2019	› Guest lecture , CS 289: Biologically-inspired Multi-agent Systems
Spring 2018	› Teaching fellow , CS 189: Autonomous Robot Systems ↗
Boston, MA	Northeastern University
2014 – 2015	› Teaching assistant , CS 2500: Fundamentals of Computer Science (2 semesters)
2012 – 2014	› Tutor , CS 2500: Fundamentals of Computer Science (3 semesters)
2011 – 2013	› Undergraduate mentor , Proactive Recruitment in Science and Mathematics (PRISM)

Outreach and Service

- 2017, 2018, 2020 Volunteer, Boston Public Schools Science Fair
2019 Marshall Scholarship Reading Committee

2018, 2019 Robot Design Judge, FIRST LEGO League
 2018 Speaker, Science in the News fall lecture series: "Brains and Bodies: How to Make Smart Robots" [@](#)
 2018 Guest, *Brains On!* science podcast live show [@](#)
 2016 Volunteer, EuroHaptics 2016
 2010 – 2015 Volunteer, Northeastern Civic Engagement Program
 2014 – 2015 Student Ambassador, Northeastern College of Science
 2014 Tutor team leader, TechBoston Academy
 2014 Teacher, NEU Splash Program. Class: "This is your Brain"
 2011 – 2013 Volunteer, Brigham and Women's Hospital
 2010 – 2011 Mentor, Massachusetts General Hospital Youth Program

Skills

Programming	Python (including NumPy, Pandas, Django) · MATLAB · C/C++ (including OpenMP, AVR, Arduino) · HTML/CSS · LaTeX · JavaScript (including Vue.js) · Java
Fabrication	Laser cutting · 3D printing · Vinyl cutting · CNC milling · Electronics design (Eagle) and production · Soldering · Sewing · Molding and casting
Other	Computer-aided design (OnShape) · Database design · Linux · 3D motion capture · Kinematic and EEG data collection in human subjects