



# Julia Ebert

PhD Candidate • Robotics Researcher

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## Education

Cambridge, MA 2016 –	<b>Harvard University</b> PhD Candidate in Computer Science Advisor: Prof. Radhika Nagpal
London, UK 2016	<b>Imperial College London</b> Master of Research in Bioengineering, with Distinction Advisors: Prof. Etienne Burdet, Dr. Ildar Farkhatdinov Thesis: <i>Assisting Balance Recovery with a Lower Limb Exoskeleton</i>
Boston, MA 2015	<b>Northeastern University</b> BS in Behavioral Neuroscience, Minor in Computer Science GPA: 3.98 / 4.0, summa cum laude Honors Thesis: <i>Asymmetric Learning in an Asymmetric Bimanual Task</i>

## Research

Cambridge, MA 2017 – 2016 –	<b>Harvard University Self-Organizing Systems Research Group</b> Prof. Radhika Nagpal <ul style="list-style-type: none"><li>› LARVAbot: Locomotion of autonomous robots via aggregation</li><li>› Multi-feature perception and decision making in robot collectives</li></ul>
Livermore, CA 2018 –	<b>Lawrence Livermore National Laboratory</b> Dr. Michael Schneider <ul style="list-style-type: none"><li>› Collaborative Autonomy for Space Situational Awareness</li></ul>
London, UK 2015 – 2016	<b>Imperial College Human Robotics Group</b> Prof. Etienne Burdet and Dr. Ildar Farkhatdinov <ul style="list-style-type: none"><li>› Co-control of balance recovery in a lower limb exoskeleton</li></ul>
Boston, MA 2014 – 2015 2012 – 2015 2011 – 2012	<b>Northeastern University Action Lab</b> Prof. Dagmar Sternad <ul style="list-style-type: none"><li>› Prediction and stability in control of objects with complex dynamics</li><li>› Learning and long-term retention of an asymmetric bimanual task</li><li>› Effects of central fatigue on cognitive and motor performance</li></ul>
Nahant, MA May – Aug. 2015	<b>Northeastern University Marine Science Center</b> Prof. Joseph Ayers <ul style="list-style-type: none"><li>› Neuro-inspired rheotaxis and antenna design in a robotic lobster</li></ul>
Watertown, MA July – Sept. 2014	<b>Interactive Motion Technologies</b> <ul style="list-style-type: none"><li>› Integrated stroke assessment software in rehabilitation robotics</li></ul>
Tübingen, DE July – Dec. 2013	<b>Max Planck Institute for Intelligent Systems</b> Prof. Stefan Schaal <ul style="list-style-type: none"><li>› Learning and exploration in a novel dimensionality-reduction task</li></ul>

## Grants and Scholarships

2016	Department of Energy Computational Science Graduate Fellowship (DOE CSGF)
2015	Marshall Scholarship

2014	Northeastern Provost Undergraduate Advanced Research Award
2013	Barry Goldwater Scholarship
2013	Northeastern Provost Undergraduate Research Award
2013	DAAD Undergraduate Scholarship
2013	Northeastern Presidential Global Scholarship
2010	Northeastern National Merit Scholarship

## Awards

2016	Finalist, Hertz Fellowship
2016	Honorable Mention, National Science Foundation Graduate Research Fellowship Program (NSF GRFP)
2015	Northeastern University Honors Program Distinction
2015	Northeastern Honors in Behavioral Neuroscience
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

## Papers

**Ebert J.**, Gauci M., Nagpal R., "Multi-feature collective decision making robot swarms", in *Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems*, International Foundation for Autonomous Agents and Multiagent Systems, 2018, pp. 1711–1719.

Bazzi S., **Ebert J.**, Hogan N., Sternad D., "Stability and Predictability in Dynamically Complex Physical Interactions", in *2018 IEEE International Conference on Robotics and Automation (ICRA)*, 2018, pp. 5540–5545.

Bazzi S., **Ebert J.**, Hogan N., Sternad D., "Stability Analysis of Human Movement: Contraction Theory as a New Tool", 2018, Accepted to *Chaos*.

Farkhatdinov I., **Ebert J.**, van Oort G., van Asseldonk E., Burdet E., "Experiments on Human Balancing Co-Control in Standing", 2018, Submitted to *IEEE RA-L*.

Park S., **Ebert J.**, Sternad D., "Asymmetric Learning in an Asymmetric Bimanual Task", In preparation.

## Conference Abstracts and Posters

**Ebert J.**, Meyers J., Dawson W., Schneider M., "Collaborative Autonomy for Space Situational Awareness", 2018, Poster at: *Lawrence Livermore National Laboratory Summer Student Poster Symposium*, 8 August 2018, Livermore, CA.

**Ebert J.**, Gauci M., Nagpal R., "Multi-Feature Collective Decision Making in Robot Swarms", 2018, Poster at: *DOE CSGF Program Review*, 15–19 July 2018, Washington, DC.

**Ebert J.**, Teeple C., Steinhardt E., Ramanathan S., "Infotaxis in a Multi-agent Sensor Network", 2018, Poster at: *DOE CSGF Program Review*, 24–27 July 2017, Washington, DC.

Farkhatdinov I., **Ebert J.**, van Oort G., van Asseldonk E., Burdet E., "Human Balance Augmentation with Lower Limb Exoskeleton Robot", 2017, Extended abstract and poster at: *RehabWeek 2017 workshop: Towards a next generation of wearable robotic devices for human-oriented assistance and therapy*, 17 July 2017, London, UK.

**Ebert J.**, Farkhatdinov I., van Oort G., van Asseldonk E., Burdet E., "Preliminary Study on Assisting Balance Recovery with Lower Limb Exoskeleton", 2016, Work in progress paper and poster at: *EuroHaptics 2016*, 4–7 July 2016, London, UK.

Sternad D., Mukovskiy A., **Ebert J.**, Dijkstra T., "Dynamic Stability in the Control of Complex Objects", 2016, Poster at: *Biomechanics and Neural Control of Movement 2016*, 12–17 June 2016, Mt. Sterling, OH.

**Ebert J.**, Park S., Sternad D., "Asymmetric Learning in an Asymmetric Bimanual Task", 2015, Poster at: *Society for the Neural Control of Movement 25th Annual Meeting*, 20–24 April 2015, Charleston, SC.

**Ebert J.**, Mukovskiy A., Dijkstra T., Sternad D., "Why You Don't Spill Your Coffee", 2015, Poster at: *Northeastern University Research, Innovation, and Scholarship Expo (RISE)*, 9 April 2015, Boston, MA.

**Ebert J.**, Kim S., Sternad D., Schaal S., "Learning and exploration in a novel dimensionality-reduction task", 2014, Poster at: *Society for the Neural Control of Movement 24th Annual Meeting*, 20–25 April 2014, Amsterdam, NL.

**Ebert J.**, Park S., Sternad D., "Asymmetric Learning in an Asymmetric Bimanual Task", 2014, Poster at: *Northeastern University Research, Innovation, and Scholarship Expo (RISE)*, 10 April 2014, Boston, MA.

**Ebert J.**, Park S., Sternad D., "Asymmetric Learning in an Asymmetric Bimanual Task", 2013, Poster at: *Northeast Undergraduate Research and Development Symposium*, 2–3 March 2013, Biddeford, ME.

**Ebert J.**, Park S., Griffen L., O'Neil Pirozzi T., Sternad D., "Central Fatigue in Cognitive and Motor Performance", 2012, Poster at: *Northeastern University Research, Innovation, and Scholarship Expo (RISE)*, 29 March 2012, Boston, MA.

## Teaching

### Cambridge, MA

Fall 2018  
Spring 2018

### Harvard University

- › **Teaching Staff**, How To Make (Almost) Anything, Harvard section
- › **Teaching Fellow**, CS 189: Autonomous Robot Systems

### Boston, MA

2014 – 2015  
2012 – 2014  
2011 – 2013

### Northeastern University

- › **Teaching Assistant**, CS 2510: Fundamentals of Computer Science (2 semesters)
- › **Tutor**, CS 2510: Fundamentals of Computer Science (3 semesters)
- › **Undergraduate Mentor**, Proactive Recruitment in Science and Mathematics (PRISM)

## Outreach and Service

2018	Guest, <i>Brains On!</i> science podcast live show
2017, 2018	Volunteer, Boston Public Schools Science Fair
2016	Volunteer, EuroHaptics 2016
2010 – 2015	Volunteer, Northeastern Civic Engagement Program
2014	Tutor team leader, TechBoston Academy
2011 – 2013	Volunteer, Brigham and Women's Hospital
2010 – 2011	Mentor, Massachusetts General Hospital Youth Program

## Skills

### Programming

Python (including Django, NumPy) · MATLAB · C/C++ (including OpenMP, AVR, Arduino) · HTML/CSS · LaTeX · JavaScript · Java

### Fabrication

Laser cutting · 3D printing · Vinyl cutting · CNC milling, ShopBot · Electronics design (Eagle) and production · Soldering · Sewing · Molding and casting

### Other

Computer-aided design (OnShape) · Database design · Linux · Embedded programming · 3D motion capture · Kinematic and EEG data collection in human subjects

## Relevant Coursework

### Computer Science

Biologically-inspired Multi-agent Systems · Distributed Systems · Machine Learning · Network Algorithms · Computational Neurodynamics · Artificial Intelligence · Robotics

### Science and Engineering

How to Make (Almost) Anything · Biomimetics · Comparative Neurobiology · Human Neuroanatomy · Biochemistry · Genetics and Molecular Biology · Organic Chemistry

### Mathematics

Biological Signal Processing · Statistics and Data Analysis · Multivariable Calculus · Linear Algebra · Differential Equations