

# Dan Blustein

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## EDUCATION

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- 2015 - *Present* Postdoctoral Research Fellow, INSTITUTE OF BIOMEDICAL ENG., **University of New Brunswick**  
Project: "Human motor control for neuroprosthetic applications"
- 2015 Ph.D. in BIOLOGY, **Northeastern University**  
Dissertation: "Biomimetic lobster control with a synthetic nervous system"
- 2006 BA in BIOLOGY, **Kalamazoo College**

## EMPLOYMENT

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- 2017 - *Present* Contract Academic Instructor DEPARTMENT OF BIOLOGY **University of New Brunswick**

## FELLOWSHIPS, GRANTS & HONORS

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NEW BRUNSWICK HEALTH RESEARCH FOUNDATION	<b>Rising Star Researcher</b>	2017
NATIONAL SCIENCE FOUNDATION	<b>Graduate Research Fellowship</b>	2009-2012
AAAS/IEEE	<b>Mass Media Science &amp; Engineering Fellowship</b>	2013
NORTHEASTERN UNIV. PROVOST'S OFFICE	<b>Dissertation Completion Fellowship</b>	2014
NORTHEASTERN UNIV. VENTURE ACCELERATOR	<b>Prototype Fund Award (x2)</b>	2014
MARINE TECHNOLOGY SOCIETY	<b>Graduate Student Scholarship</b>	2011-12

## PEER-REVIEWED PUBLICATIONS

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- Blustein, D**, A Wilson, J Sensinger. 2018. Assessing the quality of supplementary sensory feedback using the crossmodal congruency task. *Scientific Reports*. DOI: [10.1038/s41598-018-24560-3](https://doi.org/10.1038/s41598-018-24560-3)
- Marasco, P, J Hebert, J Sensinger, C Shell, J Schofield, Z Thumser, R Nataraj, D Beckler, M Dawson, **D Blustein**, S Gill, B Mensh, R Granja-Vazquez, M Newcomb, J Carey, B Orzell. 2018. Illusory movement perception improves motor control for prosthetic hands. *Science Translational Medicine*. DOI: [10.1126/scitranslmed.aao6990](https://doi.org/10.1126/scitranslmed.aao6990)
- Blustein, D**, J Sensinger. 2017. Validation of a constrained-time movement task for use in rehabilitation outcome measures. *International Conference on Rehabilitation Robotics (ICORR)*. DOI: [10.1109/ICORR.2017.8009410](https://doi.org/10.1109/ICORR.2017.8009410)
- Wilson, A, **D Blustein**, J Sensinger. 2017. A third arm - Design of a bypass prosthesis enabling incorporation. *International Conference on Rehabilitation Robotics (ICORR)*. DOI: [10.1109/ICORR.2017.8009441](https://doi.org/10.1109/ICORR.2017.8009441)
- Blustein, D**, RC Anderson. 2016. Localization of octopus drill holes on cowries. *American Malacological Bulletin*. DOI: [10.4003/006.034.0101](https://doi.org/10.4003/006.034.0101)
- Westphal, A, **D Blustein**, J Ayers. 2013. A biomimetic neuronal network-based controller for guided helicopter flight. *Int. Conf. on Biomimetic and Biohybrid Systems*, London, UK. DOI: [10.1007/978-3-642-39802-5\\_26](https://doi.org/10.1007/978-3-642-39802-5_26)
- Blustein, D**, N Rosenthal, J Ayers. 2013. Designing and implementing nervous system simulations on LEGO robots. *J Visualized Experiments*. DOI: [10.3791/50519](https://doi.org/10.3791/50519)
- Ayers, J, **D Blustein**, A Westphal. 2012. A conserved biomimetic control architecture for walking, swimming and flying robots. *Int. Conf. on Biomimetic and Biohybrid Systems*, Barcelona, Spain. DOI: [10.1007/978-3-642-31525-1\\_1](https://doi.org/10.1007/978-3-642-31525-1_1)
- Ayers, J, A Westphal, **D Blustein**. 2011. A Conserved Neural Circuit-based Architecture for Ambulatory and Undulatory Biomimetic Robots. *Marine Technology*. DOI: [10.4031/MTSJ.45.4.17](https://doi.org/10.4031/MTSJ.45.4.17)
- Blustein, D**, RC Anderson. 2011. Octopuses drill crab chelae on the inside (oral side). *The Festivus*, **43(1):6-7**.

- Blustein, D**, J Ayers. 2010. A conserved network for control of arthropod exteroceptive optical flow reflexes during locomotion. *Int. Conf. on Simulation of Adaptive Behavior*, Paris, France. DOI: [10.1007/978-3-642-15193-4\\_7](https://doi.org/10.1007/978-3-642-15193-4_7)
- Blustein, D**, RC Anderson. 2010. Cone shell found in an octopus midden in Bonaire. *The Festivus*, **42(10)**:131-132.
- Anderson, RC, **D Blustein**. 2006. Smart octopus? *The Festivus*, **38(1)**:7-9.
- Blustein, D**, N Hinkle, A Smith. 2005. Evaluation of a quaternary ammonium salt as an antimicrobial surface treatment. *Gravitational and Space Biology*, **18(2)**:81-2.

## FORTHCOMING PUBLICATIONS

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- Blustein, D**, K Englehart, J Sensinger. Analyzing trial-by-trial adaptation of human movements using a Bayesian estimator. In revision at *PLoS Computational Biology*.
- Gill, S, **D Blustein**, A Wilson, J Sensinger. The crossmodal congruency effect, a tool incorporation metric, suffers from a learning effect with repeated exposures. In revision at *PLoS ONE*. Preprint DOI: [10.1101/186825](https://doi.org/10.1101/186825)

## RESEARCH EXPERIENCE

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|--------------------------------|--|
| April 2015 -<br><i>Present</i> | UNIVERSITY OF NEW BRUNSWICK<br><i>Postdoctoral researcher</i> . Design prosthesis assessment metrics using a computational motor control framework and study human sensorimotor processing. Work funded by DARPA and NIH.          |
| 2008 - 2015                    | NORTHEASTERN UNIVERSITY<br><i>Research assistant during Ph.D.</i> Designed, built and tested biomimetic robots for neuroscience investigation. Work funded by the NSF, Office of Naval Research and Schlumberger.                  |
| 2013, 2011<br>2010, 2003       | SEATTLE AQUARIUM<br><i>Field research assistant</i> . Conducted octopus behavioral studies in the laboratory and on Caribbean reefs.   |
| SUMMER 2005                    | MASSACHUSETTS INSTITUTE OF TECHNOLOGY<br><i>Science Intern at the Mars Gravity Biosatellite Program</i> . Developed and tested microbial safety levels in self-contained mouse life support systems for space flight applications. |
| JAN. - FEB. 2005               | TIPUTINI BIODIVERSITY STATION, <i>Ecuador</i><br><i>Ecology intern</i> . Conducted field experiments investigating invertebrate diversity in a tropical rainforest.  |
| SUMMER 2004                    | NASA KENNEDY SPACE CENTER<br><i>Spaceflight and Life Sciences Trainee</i> . Tested antimicrobial surface treatments for use within spacecraft.   |

## PROFESSIONAL TRAINING

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|-------------|---|
| FALL 2017   | DIPLOMA IN UNIVERSITY TEACHING<br>Instructional training program at the Univ. of New Brunswick's Centre for Enhanced Teaching & Learning.   |
| 2016        | SUMMER SCHOOL IN COMPUTATIONAL SENSORY-MOTOR NEUROSCIENCE<br>Attended cross-disciplinary training course in mathematical modeling techniques in neuroscience at the University of Minnesota. Funded by NIH and Brain Canada.  |
| FALL 2008   | EXPERIENCE IN COLLEGE TEACHING COURSE<br>Studied teaching pedagogy and best practices and conducted a teaching and learning research project through a 2-credit graduate level course at Northeastern University (BIOL 6380). |
| 2004 - 2005 | ENVIRONMENT AND ECOLOGY PROGRAM IN ECUADOR<br>Studied environmental science and the ecology of Ecuador at the Universidad San Francisco de Quito.   |

## PROFESSIONAL SERVICE

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- 2015 - *Present* | REVIEWER  
Review journal submissions for *PLOS Computational Biology*, *PLOS ONE*, *Journal of Neural Engineering*, *Sensors*, and *Transactions on Neural Systems and Rehabilitation Engineering*. [Publons review record](#).
- 2017 - *Present* | FACULTY FOCUS GROUP MEMBER  
Member of teaching resources network funded by UNB's Teaching and Learning Priority Fund.
- 2015 - *Present* | AAAS MASS MEDIA FELLOWSHIP SELECTION COMMITTEE MEMBER  
Review applications for the AAAS Science and Engineering Fellows Program.
- 2015 - 2017 | CONFERENCE ORGANIZING COMMITTEE MEMBER  
Planned and organized MEC17, a triennial symposium focusing on upper limb prosthetics and myoelectric control.
- 2011 - 2014 | CONSERVATION COMMISSIONER AT THE CITY OF REVERE  
Oversaw the compliance and enforcement of the Massachusetts Wetlands Protection Act.
- 2010 - 2014 | COMMUNITY OUTREACH REPRESENTATIVE AT THE MYSTIC RIVER WATERSHED ASSOCIATION  
Coordinated community events related to the nonprofit organization's events in and around the City of Revere.
- 2012 - 2013 | CO-FOUNDER AND CHAIR OF MARINE TECHNOLOGY SOCIETY STUDENT SECTION  
Organized Northeastern University student group educational and outreach activities.
- 2011 - 2012 | MATH TUTOR AT HARRIETT TUBMAN HOUSE  
Instructed adult GED students in basic mathematics concepts.
- 2014, 2011  
2009 | TEAM MENTOR AT THE MUSEUM OF SCIENCE (Boston, MA)  
Supervised and mentored high school teams competing in the MIT-Lemelson Design Competition.

## PUBLISHED ABSTRACTS AND CONFERENCE PRESENTATIONS

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P = Poster presentation; O = Oral presentation; C = Co-author presentation

- Blustein, D.** 2017. Think-Pair-Tweet: Active Learning Techniques for Large Classes. Kaleidoscope: UNB's Teaching Showcase. Fredericton, NB, Canada.<sup>O</sup>
- Blustein, D,** S Gill, and J Sensinger. 2017. The Control Bottleneck Index: a novel outcome metric providing generalizable and actionable assessment of upper-limb prosthetic systems. MEC17. Fredericton, NB, Canada.<sup>P</sup>
- Wilson, A, S Gill, **D Blustein**, and J Sensinger. 2017. Prosthesis incorporation: an outcome metric to assess tool incorporation of a prosthetic limb. MEC17. Fredericton, NB, Canada. <sup>P-C</sup>
- Blustein, D,** A Wilson, and J Sensinger. 2017. A novel outcome metric providing actionable assessments of upper-limb prosthetic systems. 22nd Annual Nursing Research Day. UNB. Fredericton, NB, Canada.<sup>P</sup>
- Sensinger, J, **D Blustein**, A Wilson, and S Gill. 2017. Novel upper-limb outcome measures for bi-directional upper-limb neural prostheses. International Society for Prosthetics and Orthotics World Congress. Cape Town, South Africa.<sup>O-C</sup>
- Blustein, D,** and J Sensinger. 2016. Extending a Bayesian estimation approach to model human movements. Program No. 486.10. 2016 Neuroscience Meeting Planner, Society for Neuroscience. Washington, DC.<sup>O</sup>
- Gill, S., **D Blustein**, A Wilson and J Sensinger. 2016. Human movement assessment to improve upper-limb prosthetic technologies. 8th Annual Health Research Conference, NB Health Research Foundation. Fredericton, NB.<sup>P</sup>
- Blustein, D,** A Wilson and J Sensinger. 2015. A comprehensive and modular assessment tool for upper-limb prostheses. 7th Annual Health Research Conference, NB Health Research Foundation. Fredericton, NB.<sup>P</sup>

- Blustein, D**, A Westphal and J Ayers. 2014. CPG-driven locomotion of a robotic lobster. Program No. 471.07. 2014 Neuroscience Meeting Planner, Society for Neuroscience. Washington, DC.<sup>P</sup>
- Ratliff, J, **D Blustein**, A Westphal and J Ayers. 2014. Corollary discharge in an embodied nervous system simulation. Program No. 181.01. 2014 Neuroscience Meeting Planner, Society for Neuroscience. Washington, DC.<sup>P-C</sup>
- Blustein, D**, K Schultheis and J Ayers. 2013. Using LEGO robots for bioengineering research and instruction. Northeastern University Research, Innovation and Scholarship Expo. ID 14.<sup>P</sup>
- Blustein, D**, A Westphal and J Ayers. 2012. Building the brain for a robotic bee. Northeastern University Research, Innovation and Scholarship Expo. ID 342.<sup>P</sup>
- Blustein, D**, K Schultheis and J Ayers. 2011. Building nervous systems for robots: an interactive and collaborative neuroscience curriculum. National Science Teachers Association. National Conference, San Francisco, CA.<sup>O</sup>
- Blustein, D** and J Ayers. 2010. Simulation of sensory fusion of optical and hydrodynamic flow in the lobster. Program No. 308.14. 2010 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience.<sup>P</sup>
- Blustein, D** and J Ayers. 2010. A conserved network for control of arthropod exteroceptive optical flow reflexes during locomotion. 11th International Conference on Simulation of Adaptive Behavior, SAB 2010. Paris, France.<sup>O</sup>
- Blustein, D**, TRF Fulford-Jones and E Wagner. 2005. Ensuring Long-Term Environmental Stability of Rodent Food Substrates within an Autonomous Life Support Module. Pew Midstates Undergraduate Symposia, Washington University, St. Louis, MO.<sup>O</sup>
- Fulford-Jones, TRF, N Steber, HB Laird and **DH Blustein**. 2005. Ensuring long-term environmental stability of rodent food substrates within an autonomous life support module. Gravitational and Space Biology. 19:20. [American Society for Gravitational and Space Biology 21st Annual Meeting. Reno, NYV.<sup>P-C</sup>]
- Blustein, D**, N Hinkle and A Smith. 2004. Evaluation of a Quaternary Ammonium Salt as an Antimicrobial Surface Treatment. Gravitational and Space Biology. 18(1):7. [American Society for Gravitational and Space Biology 20th Annual Meeting. 2004. New York, NY.<sup>P</sup>]

## INVITED TALKS

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MAY 2018	<b>Emerging Technologies Conf. - Bionics Workshop</b>	Whistler, BC	<i>Research talk</i>
FEB. 2018	<b>DARPA PI Meeting</b>	Charleston, SC	<i>Research talk</i>
JULY 2017	<b>University of Giessen</b>	Giessen, Germany	<i>Academic seminar</i>
JAN. 2015	<b>Okinawa Institute of Science and Technology</b>	Okinawa, Japan	<i>Academic seminar</i>
AUGUST 2014	<b>D'Amore-McKim School of Business (NEU)</b>	Boston, MA	<i>Classroom lecture</i>
MARCH 2014	<b>Swampscott Public Library</b>	Swampscott, MA	<i>Public lecture</i>
MARCH 2014	<b>India Institute for Technology</b>	Kanpur, India	<i>Tech expo exhibition</i>
JULY 2012	<b>Museum Institute for Teaching Science</b>	Buzzards Bay, MA	<i>Teacher workshop</i>
JULY 2012	<b>Univ. of Rhode Island Metcalfe Institute</b>	Narragansett, RI	<i>Panelist speaker</i>
APRIL 2012	<b>MA Marine Educators Association Conference</b>	Woods Hole, MA	<i>Keynote lecture</i>
SEP. 2010	<b>Harvard University Robobee Symposium</b>	Cambridge, MA	<i>Public lecture</i>
AUG. 2010	<b>Univ. of Hannover School of Veterinary Medicine</b>	Hannover, Germany	<i>Academic seminar</i>

2006 -  
*Present*

Many presentations to K-12 groups including: World's Unbound Camp (NB), Leo Hayes High School (Fredericton, NB), Bliss Carman Middle School/Brilliant Labs (Fredericton, NB), Girls Inc. (Lynn, MA), Lincoln School (Brookline, MA), Buckingham Browne and Nichols School (Cambridge, MA), MIT Museum (Cambridge, MA), NEU Marine Science Center Outreach (Nahant, MA), St. Francis Indian School (South Dakota), Mazapan School (La Ceiba, Honduras), Bright Star Secondary Charter Academy (Los Angeles, CA)

## TEACHING EXPERIENCE

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<u>Semester</u>	<u>Course</u>	<u>Institution</u>	<u>Role</u>
WINTER 2018	<b>Principles of Biology, Part II</b>	University of New Brunswick	<i>Instructor (2 sections)</i>
SUMMER 2017	<b>Principles of Biology, Part I</b>	University of New Brunswick	<i>Instructor</i>
FALL 2014	<b>Neuroethology</b>	Northeastern University	<i>Lab curriculum developer</i>
FALL 2008	<b>Neuroethology</b>	Northeastern University	<i>Teaching assistant</i>
FALL 2005	<b>Organism Diversity</b>	Kalamazoo College	<i>Teaching assistant</i>

## STUDENT MENTORSHIP

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<u>Student</u>	<u>Student's institution</u>	<u>Experience</u>	<u>Location</u>	<u>Date</u>
OSCAR A.	<b>University of New Brunswick (UNB)</b>	MASTER'S	UNB	2018 - present
MORITZ N.	<b>University of Osnabrück</b>	INTERNSHIP	UNB	2017
MATTHEW S.	<b>University of New Brunswick</b>	INTERNSHIP	UNB	2017
VIVIEN G.	<b>Ontario On-line Coop Program</b>	COOP	Online	2016 - 2017
CHRIS F.	<b>University of New Brunswick</b>	INTERNSHIP	UNB	2015
MARISSA S.	<b>Northeastern University (NEU)</b>	Coop	NEU	2014
JACOB R.	<b>Northeastern University</b>	Coop	NEU	2014
CLINT V.	<b>Northeastern University</b>	Coop	NEU	2013 - 2014
PHILIP B.	<b>Kalamazoo College</b>	EXTERNSHIP	NEU/Bonaire	2013
ANGELICA G.	<b>Northeastern University</b>	DIRECTED STUDY	NEU	2012
VANESSA S.	<b>Northeastern University</b>	DIRECTED STUDY	NEU	2012
ALEX G.	<b>Northeastern University</b>	COOP	NEU	2012
ANDY V.	<b>Lynn Vocational High School</b>	COOP	NEU	2012 - 2013
RICKY R.	<b>Lynn Vocational High School</b>	COOP	NEU	2011 - 2012
NIKOLAI R.	<b>Bremen University</b>	INTERNSHIP	NEU	2011 - 2012
THANH L.	<b>Northeastern University</b>	COOP	NEU	2011
ALLISON C.	<b>Northeastern University</b>	COOP	NEU	2011
BEN D.	<b>Muhlenburg College</b>	INTERNSHIP	NEU	2011 & 2013
CHRIS B.	<b>Lynn Vocational High School</b>	COOP	NEU	2010 - 2011
FALLON S.	<b>Northeastern University</b>	COOP	NEU	2010
CHRIS W.	<b>Northeastern University</b>	COOP	NEU	2010
KELSEY M.	<b>Northeastern University</b>	DIRECTED STUDY	NEU	2010
REBECCA L.	<b>Northeastern University</b>	COOP	NEU	2008

## SELECTED POPULAR SCIENCE PUBLICATIONS

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Dozens of science-related newspaper articles including:

"Diary of a 2013 Mass Media Fellow"	IEEE - USA IN ACTION	Winter 2013
"Oyster revival in the works"	RALEIGH NEWS & OBSERVER	8/19/2013
"DNA computing used to ID cancer cells"	CHARLOTTE NEWS & OBSERVER	8/12/2013
"Moving objects with your mind"	RALEIGH NEWS & OBSERVER	6/21/2013
"Bird feeding, let's leave it to the birds"	REVERE JOURNAL	1/20/2012

Dozens of science-related blog posts including:

"Robolobster goes to India"	INSOLUTION: NEU'S RESEARCH BLOG	3/20/2014
"Can a bee brain control a helicopter?"	NEU GRAD STUDENT RESEARCH BLOG	7/15/2012
"Sports and research: united by randomness"	NEU GRAD STUDENT RESEARCH BLOG	2/2/2012

## SCIENCE MEDIA EXPERIENCE

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Grant-funded research videos, CENTER FOR OCEAN SCIENCE EDUCATION EXCELLENCE	2014
Grant-funded science fieldtrip videos, LINCOLN & THERESE FILENE FOUNDATION	2014
Twitter Ambassador, NORTHEASTERN UNIVERSITY COLLEGE OF SCIENCE	JAN. 2013 - DEC. 2014
Science Reporter/AAAS Fellow, RALEIGH NEWS AND OBSERVER	JUNE - AUG. 2013
Creating Our Futures Video Contest Finalist, NATIONAL SCIENCE FOUNDATION	2012