

AHSAN I. NAWROJ

B.S., M.S., M.Phil., PhD (expected 2017)

Yale University
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EDUCATION

Yale University, New Haven, CT

PhD Candidate, Engineering and Applied Science (Robotics); Advisor: Aaron Dollar May 2017 (expected)
Dissertation: Design of an articulated, network-robot for constructing discrete structures.

M.Phil., Engineering and Applied Science (Robotics) 2014

M.S., Engineering and Applied Science (Robotics) 2013

Design of a size-invariant, bulk-conductive polymer using embedding of metallic cells.

Lafayette College, New Haven, CT

B.S., Electrical and Computer Engineering with Honors 2008 – 2012

Minor: Computer Science

Summa cum laude, GPA: 3.89

Honor thesis: Design of remote rover teleoperated through a brain-computer interface.

Test Scores:

GRE: Verbal (590), Math (800), Analytical (4.5)

SAT: Critical Reading (760), Math (750), Writing (730)

LEADERSHIP EXPERIENCE

- **Yale Graduate Consulting Club (YGCC) Case Competition** Mar. 2016
 - Proposed a growth and recovery strategy for a large electronics retailer facing competition from online stores
 - Performed price modeling and return-on-investment for implementing revised digital in-store experience
- **Mechanical Engineering Introduction to Design Lab** 2014 – 2017
 - Led ~30 students for 4 semesters through various mechanical design laboratories
 - Coached students in design intuition, mathematical analysis, simulation development
 - Developed and implemented lab exercise in vibration analysis to append to curriculum
- **President of the Reeder St. Fellows** 2011 – 2012
 - Led a house of 12 individuals in organizing campus-wide intellectual discussions with attendance of 20-30/week
 - Managed weekly budget for events ~\$200/week
- **IEEE Student Branch Training Leadership Workshops (SLTW), Ohio State University** 2012
 - Region II Facilitator for the Lehigh Valley, organized workshop for ~50 attendees
- **Tau Beta Pi Pennsylvania Epsilon Chapter Leadership Board** 2011 – 2012
 - As Treasurer managed ~\$5,000 budget per semester
- **Lafayette College International Student Orientation Leader** 2010
 - Travel logistics, Tours and Organizing Social Activities for ~60 students

HONORS & AWARDS

- Albert P. Gagnebin Fellowship (Yale University) for \$64,950/yr 2014 – 2015
 - Finalist (top 4), Student Best Hardware Demonstration, ASME Smart Materials, Adaptive Structures, and Intelligent Systems Conference (SMASIS); Monetary award \$400 Sept. 2014
 - Lafayette College Reeder St. Fellowship 2009 – 2012
 - Lafayette College Dean's List (8 semesters) 2008 – 2012
 - Lafayette College Diversity Award 2008
 - GCSE O'Level Academic Distinction (Highest national score: Math, Pure Math, Geography) 2006
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SELECT PUBLICATIONS & PATENTS

Peer-Reviewed Journals

- J4** A. I. Nawroj, J. P. Swensen, and A. M. Dollar, "Towards Modular Active-Cell Robots (MACROs): SMA Cell Design and Modeling of Compliant, Articulated Meshes", *IEEE Transactions in Robotics* (accepted)
- J3** J. P. Swensen, A. I. Nawroj, P. E. I. Pounds, and A. M. Dollar, "Active cells for redundant and configurable articulated structures," *Smart Materials and Structures*, Oct. 2014.
- J2** L. F. Schettino, A. Pallottie, C. Borland, S. Nessa, A. I. Nawroj, and Y.-C. Yu, "The organization of digit contact timing during grasping," *Expt. Brain Research. Experimentelle Hirnforschung. Expérimentation cérébrale*, Jun. 2013.
- J1** A. I. Nawroj, J. P. Swensen, and A. M. Dollar, "Electrically conductive bulk composites through a contact-connected aggregate," *PLoS One*, Jan. 2013.

Peer-Reviewed Conferences

- C4** A. I. Nawroj, J. P. Swensen, and A. M. Dollar, "Design of Mesoscale Active Cells for Networked, Compliant Robotic Structures," *Intelligent Robots and Systems (IROS)*, 2015. (Oral Presentation, Session Chair)
- C3** J. P. Swensen, A. I. Nawroj, P. E. I. Pounds, and A. M. Dollar, "Simple, scalable active cells for articulated robot structures," in *2014 IEEE International Conference on Robotics and Automation (ICRA)*, 2014.
- C2** A. I. Nawroj, M. Toneva, H. Admoni, and B. Scassellati, "An Exploration of Social Grouping in Robots: Effects of Behavioral Mimicry, Appearance, and Eye Gaze," *Cognitive Science Society*, 2014. (Presentation, Hardware demo)
- C1** Y.-C. Yu, S. Shrestha, A. I. Nawroj, M. Sotomayor, and R. Koplin, "Microprocessor control of an ultrasonic scanning device," in *Programmable Devices and Embedded Systems*, 2012.

Patents

- P1** Shrestha, Shailesh (Bremen, DE), Nawroj, Ahsan (Easton, PA, US), Yu, Yih-Choung (Easton, PA, US), Sotomayor, Marcos (New York, NY, US), Koplin, Richard (New York, NY, US), 2012
Ultrasonic Scanning Probe With a Tuning Fork-Type Oscillator and Feedback Control Thereof (United States).
Control number: 20120236258.

TEACHING EXPERIENCE & MENTORSHIP

Teaching Fellow, Yale University, New Haven, CT

Introduction to Mechanical Design (ME 185: Design and prototyping laboratory assignments) 2014 – 2016

Peer tutor, Lafayette College, Easton, PA

Introduction to Computer Science (CS101: Programming concepts) 2010 – 2012

Introduction to Computer Science (CS103: Data structures and implementation) 2011 – 2012

Electrical Engineering (ECE323: Signals and Systems analysis) 2012

SKILLS

Technical:

- **Software Programming:** Python, Lisp, Matlab, Simulink, Java, C, C++, Objective-C, Javascript, HTML/CSS/PHP, Linux, Mac OS X, Windows environments, Robot Operating System (ROS), Arduino, Processing
- **Hardware programming and simulation:** Verilog, Spice
- **Hardware Fabrication:** Mill, Lathe, Drill press, Rapid prototyping (3D printers, Laser cutter, Molding techniques)
- **Other:** Autodesk Inventor, SolidWorks, Adobe Illustrator, Adobe Photoshop, Latex

Non-Technical:

- **Languages:** English (Fluent), Bengali (Native), Spanish (Conversational)

PROFESSIONAL AFFILIATIONS

Engineer-in-training (EIT), Pennsylvania (License # ET017823) 2012

Institute of Electrical and Electronics Engineers (IEEE): Student Member From 2011

American Society of Mechanical Engineers (ASME): Student Member From 2012

Phi Beta Kappa: Academic Honor Society From 2011

Eta Kappa Nu: Electrical Engineering Honor Society From 2011

Tau Beta Pi: Engineering Honor Society From 2011

Sigma Xi: Research Honor Society From 2011

ACTIVITIES & CLUBS

Yale University Student Technology Collaborative (Ruby-on-Rails Development Team)	2015 – Present
Lafayette Robotics Club	2011 – 2012
ACM International Collegiate Programming Contest Team (Lafayette)	2010 – 2012
Lafayette ECE Departmental Demo Development (Brain-Computer Interface, Balancing controller, etc.)	2009 – 2012
Lafayette Model UN Club	2008 – 2009

RESEARCH PROJECTS

Yale University (GRABLab); Advisor: Dr. Aaron Dollar	2014 – Present
<i>PhD thesis project: MACROS</i>	
<ul style="list-style-type: none">Investigating a method of using a novel smart-actuator called Active Cells to completely re-envision mechanical design for highly robust, deformable robotic mechanisms and structures.	
Yale University (Social Robotics Lab); Advisor: Dr. Brian Scassellati	2014 – 2015
<i>NSF Expedition in Computing on Socially Assistive Robots (Yale, MIT, USC, Stanford)</i>	
<ul style="list-style-type: none">Modified the toy robot “MyKeepon” for use in controlled social robotics experiments (at the Yale Social robotics lab as well as partner institutions of the Expedition).	
Yale University (Social Robotics Lab); Advisor: Dr. Brian Scassellati	2014 – 2015
<ul style="list-style-type: none">Studied the human perception of social grouping using randomized online experiments on Amazon Mechanical Turk.	
Yale University (GRABLab); Advisor: Dr. Aaron Dollar, Supervisor: Dr. John Swensen	2012 – 2013
<ul style="list-style-type: none">Investigated a simple embedding of conductive elements in a polymer to create a bulk conductive composite without significantly affecting the polymer stiffness properties.	
Lafayette College (ECE, Neuroscience); Advisors: Dr. Yih-Choung Yu, Dr. Lisa Gabel	2011 – 2012
<ul style="list-style-type: none">Developed an EEG-based brain-computer interface to use human thought to control a remote robot.	
Lafayette College (ECE), New York Eye Ear Infirmary;	2009 – 2011
Advisors: Dr. Yih-Choung Yu, Dr. Richard Koplín (MD)	
<ul style="list-style-type: none">Developed a first prototype for a variable-scan ultrasonic eye-imaging probe that leverages low-amplitude controlled oscillation of the probe to perform scanning of different regions of the eye.	
Lafayette College (ECE); Advisor: Dr. Ge (Frank) Xia	Summer 2009
<ul style="list-style-type: none">Studied Delaunay triangulations of arbitrary communication node layouts, experimenting with unusual configurations to attempt to experimentally reduce the upper bound on the stretch factor.	
Lafayette College (ECE); Advisor: Dr. John Greco	Summer 2008
<ul style="list-style-type: none">Implemented mapping, navigation and maze-traversal of a Micromouse and AmigoBot rover for an arbitrary-maze-solving competition.	

INTERESTS & HOBBIES

Playing squash: Recreational level; teaching squash to beginners (3 so far, excluding my wife)
Designing DIY gadgets: Made an array of gifts and tabletop displays (best seen in photos on my website)
Listening to podcasts: 99% Invisible, Welcome to Night Vale
Reading for pleasure: Dresden Files (new discovery!), “Rationality”-literature
