

LENA BARTELL

[linkedin.com/in/lenabartell](https://www.linkedin.com/in/lenabartell)

EDUCATION

- 2011 – 2017 **Cornell University** – Ph.D. in Applied Physics, Biomedical Engineering minor, 3.90 / 4.00 (expected)
2007 – 2011 **Penn State University** – B.S. with Honors in Physics, Biomedical Engineering & Mathematics minors, 3.97 / 4.00

SKILLS

- TECHNIQUES Data analysis • Image analysis • Computer vision • Linear regression modeling • Logistic regression modeling • Data visualization • Science communication • Microscopy • Mechanical testing • Sterile dissection & culture
LANGUAGES, ETC. MATLAB (computer vision, statistical models, data visualization) • Python (NumPy, Matplotlib, Pandas, SciPy) • Inkscape (vector graphics) • Autodesk Inventor (3D CAD) • MS Office • HTML & CSS • LaTeX • GitHub • Tableau

RESEARCH PROJECTS

- 2012 – PRESENT **Custom tools and techniques to study orthopedic mechanobiology**
Cornell University, Ithaca, NY
 - Designed and built custom mechanical testing stage that interfaces with 1,000 FPS imaging
 - Developed broadly-applicable image segmentation algorithm using MATLAB
 - Analyzed large microscopy data sets over space and time (~20 x 5 GB data sets)
 - Fit mixed effects linear regression statistical models to relate tissue mechanics with cellular dysfunction
 - Sterilely dissected and cultured whole tissue explants
 - Cultivated collaborations in biomedical engr. & veterinary medicine, to link basic science & clinical practice
- 2016 – PRESENT **Fracture mechanics of articular cartilage**
Cornell University, Ithaca, NY
 - Mentored students in experiment design, data collection, data analysis, and science communication
 - Developed new method to study crack initiation in cartilage
 - Applied MATLAB and Python algorithms to track and analyze samples over space and time
- 2015 – 2017 **4D flow behavior of glass coatings**
Corning Inc., Corning, NY & Cornell University, Ithaca, NY
 - Managed collaboration with Corning Inc., including quarterly presentations and a final report
 - Compiled and analyzed large, multi-dimensional confocal microscopy data sets using MATLAB and Python
 - Developed N-dimensional Barnes objective analysis (smoothing interpolation) in MATLAB
- 2009 – 2011 **X-ray dosimeters for diagnostic breast cancer imaging**
University of Pennsylvania, Philadelphia, PA
 - Designed, constructed, and studied the response of a custom x-ray dosimeter
 - Modeled measurement biases of existing dosimeters using MATLAB
- 2008 – 2009 **Eliminating noise from IceCube neutrino observatory data**
Penn State University, State College, PA
 - Developed level-zero filter in C++ to eliminate noise from raw neutrino detector data

DATA ANALYSIS & CODING PROJECTS

- 2017 **GUI for automated segmentation and classification of microscopy images**
 - Developed custom image segmentation algorithm based on the watershed transform
 - Implemented both segmentation and classification in a portable, user-friendly GUI
 - Created training tutorial and distributed GUI to collaborators using GitHub
 - GUI has been used for data analysis in at least three projects that will be submitted for publication soon
- 2016 **WXPN radio “A to Z” marathon playlist analysis**
 - Developed spider in Python to crawl the XPN website and scrape radio playlist metadata
 - Linked playlist metadata with MusicBrainz (open source music database) to find additional song data
 - Cleaned data and collected summary stats using Python (NumPy, Pandas)
 - Created interactive public visualization using Tableau and shared via Twitter ([click for news coverage](#))

DATA ANALYSIS & CODING PROJECTS (CONTD.)

- 2016 **N-dimensional Barnes objective analysis**
- Extended existing 2D Barnes smoothing interpolation into arbitrary N dimensions
 - Programed algorithm in MATLAB and utilized it in multiple other research projects
- 2015 **Personal website (lenabartell.com)**
- Created website using HTML and CSS
 - Managed website domain, hosting

RELEVANT COURSEWORK

- 2015 *Google's Python Class* – Free introduction to programming with Python
- 2015 *Computer Vision* – Image data acquisition and analysis with emphasis on techniques for robot vision
- 2014 *Finding Your Scientific Voice Workshop* – Intensive presentation and public speaking workshop
- 2014 *Business as a Second Language* – Introduction to business finances, marketing, etc. for engineering PhDs
- 2013 *Commercializing University Technology* – Course on bringing science to market, for MBAs and engineers

LEADERSHIP EXPERIENCE & OUTREACH

- 2016 – 2017 *Homemade microscope outreach* – Design & produce module teaching high school students about imaging
- 2015 – 2016 *Student Employee* – Cornell McGovern Center for Venture Development in the Life Sciences
- 2015 *Leadership Assessment for Managers Course* – Leadership exercises and self-assessment
- 2014 – 2015 *Advisory Board Member* – NIH Broadening Experiences for Scientific Training program at Cornell
- 2009 – 2011 *President* – Penn State University Society of Physics Students

SELECT AWARDS & FELLOWSHIPS

- 2016 - PRESENT NIH Individual F31 Predoctoral Fellowship Grant
- 2012 - 2015 NSF Graduate Research Fellowship
- 2011 - 2012 Cornell Presidential Life Science Fellowship (1 year graduate training & stipend)
- 2011 Penn State Schreyer Honors College Evans Award for Research Achievement
- 2009 Goldwater Scholarship
- 2009 American Association of Physicists in Medicine Undergraduate Fellowship
- 2010 – 2011 Penn State Department of Physics Scholarship
- 2007 - 2011 Penn State Braddock Scholarship (4 years full tuition, room & board)

RESEARCH PRESENTATIONS

- 2015, 2017 Podium presentation, Orthopaedic Research Society
- 2014, 2016 Poster presentation, Orthopaedic Research Society
- 2014 Podium presentation, Society of Rheology
- 2013 Poster presentation, Gordon Research Conference: Soft Condensed Matter Physics
- 2011 Podium presentation, International Association of Physics Students

PATENT

- 2017 “Buckling technique to determine tissue engineered construct readiness,” U.S. Provisional Application, pending.

SELECT PUBLICATIONS

- 2017 L.R. Bartell, L.J. Bonassar, I. Cohen. ArXiv Computer Vision and Pattern Recognition arXiv:1706.00815
- 2016 C.R. Henak, L.R. Bartell, L.J. Bonassar, I. Cohen. Journal of Biomedical Engineering 139, 031004
- 2015 L.R. Bartell, L.A. Fortier, L.J. Bonassar, I. Cohen. Journal of Biomechanics 48, 3400-3446
- 5 other publications, including 3 first author and 2 co-author (2 submitted, 2 in preparation)*