

# Joseph P Robinson

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## Education

### PHD RESEARCH ASSISTANT | MAY 2019 | NORTHEASTERN UNIVERSITY

**Major:** Computer Engineering

**Thesis:** *Applied machine vision with primary on automatic face and human body understanding in security, social context, and furthered human-computer interactive technologies. Emphasis put on constructing Big Data resources and experimental design.*

**COE Graduate Student Liaison,** Center for Advancing Teaching and Learning Through Research

**ECE Representative,** PhD Council

**Related coursework:** Pattern Recognition (I & II), Advanced Computer Vision, Human-Computer Interaction, Assistive Robotics, NLP, 2D Signal & Image Processing, Parallel Processing for Data Analytics, GPGPU Computing, Applied Probability and Stochastic Processing.

### INSTRUCTOR | SPRING 2018 | NORTHEASTERN UNIVERSITY

Designed and taught EECE2300 Computational Methods for Data Analytics as part-time faculty.

### BS | MAY 2014 | NORTHEASTERN UNIVERSITY

**Major:** Electrical and Computer Engineering

**Capstone:** *Designed and built a semi-autonomous robot for MassDOT that does tunnel inspections from a PC in the office. Main contributions were in the interfacing (components, GUI), communications (live media streaming, system and camera controls), image processing, Raspberry Pi configuration, database design. Won 1st in ECE Department Capstone competition.*

**Related coursework:** Computer Vision, Digital Image Processing, Found Visualization, Robotics, Optimization Methods, Algorithms & Data Structures, Noise and Stochastic Processes

## Related Experiences

### PHD RESEARCH ASSISTANT | SYSTEMS AND TECHNOLOGY RESEARCH (STR) | 05/16-09/17

[IARPA's JANUS Project](#) (Phase II): Implemented Product Quantization & NN search via an Inverted File Structure for a 200x speedup and negligible drop in accuracy; Developed C++ clustering toolbox (i.e., K-Means, GMM, Spectral, Rank-Order) that was used to generate results for NIST data call. [IARPA's Odin Program](#) (Phase I): Designed & implemented Python API for adversary attacks on ML models; Baselined adversary attacks (*blackbox* regime) using various CNNs for face recognition.

### ENGINEERING INTERN | MIT LINCOLN LABS | 05/14-08/14

Led joint team (i.e., NEU-SMILE/MIT-LL) in our debut participating in NIST's annual [TRECVID](#) workshop series. Features from 2 pre-trained DCNNs—1,000 objects and 360 scenes—we fused features and trained SVMs on top to ultimately rank 3rd in the challenging Multimedia Event Detection ([MED'15](#)) task, which aims to detect complex events in large corpuses of video data.

### DSP ENGINEERING CO-OP | BBN TECHNOLOGIES | 01/13-09/13

Worked on Helicopter Alert and Threat Termination-Acoustic System—A small arms detection system installed on helicopters. Worked alongside colleague (co-op) to design JAVA tool to analyze sound clips, which led to discovering a simple mean-based template matching to boost accuracy from 86% to 92%.

### EE IMAGE RECONSTRUCTION CO-OP | ANALOGIC CORPORATION | 01/12-09/12

Focus directed on SW components: critical image processing algorithms & detection functionalities integrated in CT airport bag-scanners. My work was on product transitioning from single- to dual-energy CT system. Most notably, optimized image correction & reconstruction algorithms with GPGPU & Intel Vector library to reduce HW requirements (3-to-2 computers).

### UNDERGRADUATE RESEARCH ASSISTANT | NORTHEASTERN UNIVERSITY | 07/10-12/13

Joined Optical Science Lab as visiting student for 2010 Research Experience for Undergraduate (REU), an NSF supported summer internship. As NEU full-time I continued in lab, including a 2<sup>ND</sup> REU (2011). Focused on 2 main tracks. [3-Photon Fluorescence for preliminary skin cancer detection in-vivo](#): Installed on a dual-wedge confocal microscope Implemented as additional imaging modality; Selected, characterized, aligned optical components (laser, lenses, filters); Built and characterized electronics (amplifiers & voltage controls); Calibrated the system to capture Melanin in hair specimen; Processed images. [FDTD Algorithm to simulate light propagating in lung tissue](#): Optimized FDTD algorithm; Used MATLAB Parallel Toolbox for multicore processing; Used Linux cluster distributed computing and automated via shell scripts; inquired feasible analysis for transition to GPU; Implemented on GPU; Collaborated inter-department to accurately model lung.

## Credentials

### PUBLICATIONS

- **Joseph P Robinson**, Ming Shao, Hongfu Liu, Yue Wu, Timothy Gillis, and Yun Fu. "Visual Kinship Recognition of Families In the Wild" IEEE TPAMI Special Edition: Computational Face (2018).
- Lichen Wang, Bin Sun, **Joseph P Robinson**, Taotao Jing, and Yun Fu. "A Multi-Modal Action Dataset." ACM Conference on Multimedia (2018). [submitted]
- Yue Wu, Zhengming Ding, Hongfu Liu, **Joseph P Robinson**, Yun Fu. "Kinship Classification through Latent Adaptive Subspace." IEEE Conference on Automatic Face and Gesture Recognition (2018)

- **Joseph P Robinson**, Ming Shao, Handong Zhao, Yue Wu, Timothy Gillis, and Yun Fu. "Recognizing Families In the Wild (RFIW): Data Challenge Workshop" in conjunction with ACM MM 2017" ACM Conference on Multimedia. RFIW'17 (2017).
- Shuyang Wang\*, **Joseph P Robinson**\*, and Yun Fu. "Kinship Verification on Families in the Wild with Marginalized Denoising Metric Learning." IEEE Conference on Automatic Face and Gesture Recognition (2017). \*EQUAL CONTRIBUTION
- **Joseph P Robinson**, Ming Shao, Yue Wu, and Yun Fu. "Families In the Wild (FIW): large-scale kinship image database and benchmarks." ACM Conference on Multimedia (2016).
- **Joseph P Robinson** and Yun Fu. "Pre-trained D-CNN models for detecting complex events in unconstrained videos." SPIE Commercial + Scientific Sensing & Imaging (2016).
- **Joseph P Robinson**, Edward Scott, Kevin Brady, Charlie K Dagli, and Yun Fu. "NEU- MITLL @ TRECVID 2015: Multimedia Event Detection by Deep Feature Learning." In Proceedings of TRECVID 2015, NIST, USA (2015).
- Yair Mega, Josef Kerimo, **Joseph P Robinson**, Ali Vakili, Nicolette Johnson, and Charles A DiMarzio. "Three-photon fluorescence imaging of melanin with a dual- wedge confocal scanning system." SPIE BiOS. International Society for Optics and Photonics (2012).
- Tristan Swedish, **Joseph P Robinson**, Maricris Silva, Andrew Gouldstone, David Kaeli, Charles DiMarzio, "Computational model of optical scattering by elastin in lung." Three-Dimensional & Multidimensional Microscopy: Image Acquisition & Processing XVIII (2011).

## COMMITTEES / E-BOARDS

- Hosting and Organizing Chair of [8th Workshop on AMFG](#) held in conjunction with 2018 CVPR
- Hosting and Organizing Chair of Workshop on [Faces in Multimedia](#) held in conjunction with 2018 ICME
- Program Committee (PC) for the 2018 IEEE Conference on Automatic Face and Gesture Recognition (FG 2018)
- Hosting and Chair for [Recognizing Families In the Wild \(RFIW\) Data Challenge](#) held in conjunction with FG 2018
- Hosting and Organizing Chair for [2017 New England Computer Vision](#) workshop at NEU (NECV 2017)
- PC for 2nd Big Data Transfer Learning workshop in conjunction with 2017 IEEE Big Data Conference (BDTL 2017)
- PC for International Conference on Advances in Multimedia (MMEDIA 2018)
- TPC Member for the 1st IEEE International Conference on Multimedia Information Retrieval and Processing (MIRP 2018)
- Workshop Host and Chair for [RFIW Data Challenge Workshop](#) held in conjunction with 2017 ACM MM 2017
- PC for the IEEE's FG 2017
- Relations Officer, IEEE R1 Student Activities Committee Region, 2-4 North American (01/14-01/17)
- Lead Research Ambassador, Student Research Engagement Committee, NU (12/12-01/17)
- Student President, IEEE, Northeastern University (12/13-05/14)
- Student Representative, Activity Committee (SAC), Northeastern University (09/12-12/13)
- Student Representative, SAC, College of Engineering (10/12-12/13)
- Student Senator, Student Government Association (SGA), Northeastern University (10/12-12/13)
- Committee Member, Academic Affairs, Northeastern University (10/12-12/13)
- Vice President, Phi Theta Kappa Honor Society, Northern Essex Community College (09/10-12/10)

## AWARDS

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|---|--|
| ALERT DHS HS-STEM Career Development Program RA-ship      | ECE Department Senior Capstone Competition (1st Place)   |
| Northeastern University's 'Huntington 100' Awardee        | CDSP Research Workshop Award for Best Poster             |
| IEEE and ECE Department Winner for T-shirt Design Contest | Student Government Association's Senator of the Month    |
| Outstanding Student Research, Engineer & Tech, RISE2012   | ECE Department remote control design contest (1st Place) |
| Investing in Tomorrow's Engineer Leaders Scholarship, NSF | Dean's Achievement Award (10 semesters)                  |

## LISCENSES AND CERTIFICATES

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| Certificate: Gordon Engineer Leadership Program, CENSSIS | Computer Aided Drafting Certificate, NECC              |
| Home Improvement Contractor License, Commonwealth of MA  | MA Construction Supervisor's License, Merrimac College |

## RELEVANT SKILLS

MATLAB, Python, JAVA, C++, C, Git (version control), Latex, CUDA, Bash

## PERSONAL

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|--|---|
| Demonstrated ability working on research projects & tasks      | Excellent interpersonal, problem-solving, analytical skills |
| Exceptional hands-on: wired circuits, woodwork, part assembly  | Confident public speaker, regardless of the audience        |
| Self-taught historian; lives in the moment; anticipates future | Contributing team member; proven team leader                |

## HOBBIES

Traveling                      Ice Hockey                      Skiing                      Cooking                      Boating & Fishing

<https://www.twitter.com/jrobvision>

<https://www.linkedin.com/in/jrobby/>

