

PROGRAMMING

Proficient

Python [SciPy stack | sk-learn
| sk-image | Tensorflow | Keras
| PsychoPy | PyQt], Matlab

Familiar

C++, C#, SQL, HTML/CSS,
Fortran, Java, Javascript,
Labview

FEM AND MODELING

Abaqus, Ansys, CIVA

CLASSES

- Deeplearning.ai Bootcamp (July 2018)
- Coursera: Deeplearning.ai specialization
- CSCI 497J: Deep Learning, Western Washington Univ.
- CS231n: Convolutional Neural Networks, Stanford
- Coursera: Finite Element Method, Univ. of Michigan
- Re-wrote assignments for Coursera Machine Learning MOOC in python.

TEACHING

- ECE 416: Digital Control, *Michigan State University*, Spring 2014
- ECE 230: Intro to C++, *American University of Beirut*, Fall 2004 - Spring 2006

ACADEMIC SERVICE

Session co-chairperson

- Review of QNDE Conf, 2014
- ASC Annual Conf, 2015

Peer review:

- Structural Health Monitoring
- Trans. on Vehicular Tech
- Journal of NDE
- Materials Evaluation Journal
- Ultrasonics Journal
- J. Reinf. Plast. Compos
- Measurement Journal
- IEEE Int Conf on PHM

AWARDS

- Full tuition scholarship, Carnegie Mellon University
- ASNT Fellowship Award 2011 (\$20,000)

EDUCATION

- *Ph.D., Electrical Engineering* *July 2014*
Michigan State University, East Lansing, MI
- *Master of Science in Information Networking* *May 2009*
Carnegie Mellon University, Pittsburgh, PA
- *Bachelor of Engineering in Computer and Communication* *June 2007*
American University of Beirut, Beirut, Lebanon

PROFESSIONAL EXPERIENCE

Pacific Northwest National Laboratory *Scientist* | Aug 2017 - Sept 2018
Research Associate | Sept 2014 - July 2017

- Developed in Python a Brain Computer Interface (BCI) using portable EEG headsets for image triaging rapid image labeling.
- Used signal processing and deep learning techniques for EEG signal classification and artifact detection.
- Statistical sensitivity analysis for validating acoustic simulation models used for material characterization. Funded by US Nuclear Regulatory Commission (NRC) and used for setting regulatory guides.
- Conducted ultrasound measurements and computer simulations for material characterization. Feature extraction and signature discovery from ultrasound spatio-temporal data for quantifying material degradation.
- Developed two python libraries **utkit** (extends pandas) and **scipandas** (extends xarray) for easily handling and performing common operations on ultrasound spatio-temporal data.

Michigan State University *Research Assistant* | Aug 2009 - July 2014

- Formulated a physics-based approach to feature extraction and machine learning in structural health monitoring with acoustic guided waves.
- Developed stochastic models for estimating performance and reliability of structural health monitoring under degrading sensor quality and varying environmental conditions.
- Combined electromagnetic (eddy-current) data analysis scripts in Matlab into a machine learning pipeline with a GUI. Enhanced performance by using mixed signals for noise clutter removal. Tested and tuned pipeline using field data from nuclear power plants.
- Written pre-processing and post-processing interfaces to a finite element method in Matlab for efficient large-scale parametric studies.
- Modeled and designed a novel electromagnetic sensor for eddy current inspection of aircrafts, funded by Boeing and US Air Force Research Laboratory.

Indian Institute of Technology, Madras *Intern* | May - July 2010

- Designed circuits for interfacing high frequency acoustic sensors with wireless sensors.
- Programmed motes in TinyOS/nesC for circuit board drivers and mote control. Implemented base-station in Matlab for network control and data visualization.

Carnegie Mellon University *Research Assistant* | Sept 2008 - April 2009

- Developed a physical layer model for the 5.9 GHz vehicle-to-vehicle (V2V) wireless communication channel based on empirical data collected in multiple environments.
- Developed a method for efficient implementation of the model in a discrete event simulator. Implemented the model in Network Simulator 2 (NS-2).

University of California at Berkeley *Intern* | June - Aug 2006

- Setup a WiMax network for transferring roadside data to base-station at data-center.
- Numerical modeling for optimizing highway sensors positioning for accurate estimates of travel times.

RECENT PUBLICATIONS (see website for a full list)

- **G. Dib**, O. Karpenko, et al., Ensembles of Novelty Detection Classifiers for Structural Health Monitoring using Guided Waves, Smart Materials and Structures (2017).
- **G. Dib** and L. Udpa. Design and Performance of Optimal Detectors for Guided Wave Structural Health Monitoring. In: Structural Health Monitoring 15.1 (2016).