

EDUCATION

PENNSYLVANIA STATE UNIVERSITY

PHD IN ELECTRICAL ENGINEERING, ADVISED BY DR. VISHAL MONGA

Thesis: *Tailored Algorithms for Synthetic Aperture Image Formation & Analysis*

STATE COLLEGE, PA

JAN 2015 - JUN 2018

ARIZONA STATE UNIVERSITY

MASTERS IN APPLIED MATHEMATICS, ADVISED BY DR. YUN KANG

TEMPE, AZ

JAN 2013- DEC 2014

UNIVERSITY OF PITTSBURGH

B.S. WITH MAJORS IN PURE MATHEMATICS & AFRICANA STUDIES (3.7 GPA, 3.8 MATH GPA)

PITTSBURGH, PA

AUG 2008 - MAY 2012

RESEARCH INTERESTS

- Strategies for neural networks with limited training.
- Dynamic mathematical & statistical modeling of social phenomenon.
- Assessment & design of reliable, predictable deep learning architectures for real-world deployment.

EMPLOYMENT

INDIGO AG

IMAGING SCIENTIST II

- Tasked with heading effort to employ neural network models for hyperspectral image classification.
- Both designing novel architectures and productionizing networks using Amazon Web Services.
- Collaboratively devising statistical models for limited data crop field performance assessment.
- Aiding in managing imaging pipeline for automated data collection.

BOSTON, MA

DEC 2019 - PRESENT

APPLIED RESEARCH LABORATORY, PENNSYLVANIA STATE UNIVERSITY

GRADUATE RESEARCHER (AUG '17 - JUL '18)/RESEARCH & DEVELOPMENT ENGINEER (AUG '18 - NOV '19)

- Designed deep learning architectures for training-starved image classification settings.
- Devised motion estimation solutions for state-of-the-art sonar imaging systems.
- Collaboratively tasked to build and maintain python application for modular testing of classification networks.
- Designed machine learning strategies for raw acoustic and radar processing problems.

STATE COLLEGE, PA

AUG 2017 - NOV 2019

NAVAL RESEARCH LABORATORY

PATHWAYS RESEARCH INTERN

- Developed a coherent approach for noise and blur robust image classification by exploiting sparse optimization.
- Designed a stochastic approach to dramatically speed up a hierarchical Bayesian method for compressive sensing.

WASHINGTON, DC

JUN-AUG 2015, JAN-APR 2017

MANAGEMENT SCIENCE ASSOCIATES

BUSINESS ANALYST

- Developed & managed a Java-based agent based model for understanding consumer behavior relating to social media.
- Collaborated on statistical mixed marketing models for assessing social media's impact on CPG advertising campaigns.
- Collaborated on designing hierarchical clustering method for Twitter user segmentation.

PITTSBURGH, PA

MAY-DEC 2012

PUBLICATIONS

DISCRIMINATIVE SPARSITY FOR SONAR ATR

J. MCKAY, R. RAJ, V. MONGA, & J. ISAACS, *OCEANS 2015 - MTS/IEEE Washington*

LOCALIZED DICTIONARY DESIGN FOR GEOMETRICALLY ROBUST SONAR ATR

J. MCKAY, V. MONGA, R. RAJ, *IGARSS 2016*

ROBUST SONAR ATR WITH POSE CORRECTED SPARSE RECONSTRUCTION-BASED CLASSIFICATION

J. MCKAY, V. MONGA, R. RAJ, *OCEANS 2016 - MTS/IEEE Monterey*

STUDENT POSTER FINALIST

USING FRAME THEORETIC CONVOLUTIONAL GRIDDING FOR ROBUST SYNTHETIC APERTURE SONAR IMAGING

J. MCKAY, ANNE GELB, V. MONGA, R. RAJ, *OCEANS 2017 - MTS/IEEE Anchorage*

STUDENT POSTER FINALIST

WHAT'S MINE IS YOURS: PRETRAINED CNNs FOR LIMITED TRAINING SONAR ATR

J. MCKAY, ISAAC GERG, V. MONGA, R. RAJ, *OCEANS 2017 - MTS/IEEE Anchorage*

FAST STOCHASTIC HIERARCHICAL BAYESIAN MAP FOR TOMOGRAPHIC IMAGING

J. MCKAY, R. RAJ, V. MONGA, *Asilomar 2017*

ROBUST SONAR ATR THROUGH BAYESIAN POSE CORRECTED SPARSE CLASSIFICATION

J. MCKAY, V. MONGA, R. RAJ, *IEEE Transactions on Geoscience and Remote Sensing*, 2017

BRIDGING THE GAP: SIMULTANEOUS FINE TUNING FOR IMBALANCED DATA

J. MCKAY, I. GERG, V. MONGA, *IGARSS 2018*

COUPLING RENDERING & GENERATIVE ADVERSARIAL NETWORKS FOR ARTIFICIAL SAS IMAGE GENERATION

A. REED, I. GERG, J. MCKAY, D. BROWN, D. WILLIAMS, S. JAYASURIYA, *OCEANS 2019 - MTS/IEEE Seattle*

GRANTS

LEARNED FREQUENCY DOMAIN MASKS FOR TRAINING-SIZE-ROBUST SONAR AUTOMATIC TARGET RECOGNITION

AMOUNT: 390K

OFFICE OF NAVAL RESEARCH, PI: J. MCKAY, CO-PI: I. GERG

6/19-12/20

IN-AIR CIRCULAR SAS PLATFORM FOR ATR DATA GENERATION

AMOUNT: 10K

INTERNAL RESEARCH & DEVELOPMENT, PI: THOMAS BLANFORD, CO-PI: J. MCKAY & D. BROWN

1/19-7/19

PROGRAMMING SKILLS

HIGHLY PROFICIENT

Python INCLUDING PANDAS, TENSORFLOW, KERAS
R INCLUDING MOST STANDARD STATS PACKAGES, Matlab

PROFICIENT

Java, C++,
SAS (STATISTICS), Bash, SQL

TEACHING

PSU	EE 353 SIGNALS AND SYSTEMS: CONTINUOUS AND DISCRETE-TIME LINEAR SYSTEMS (INSTRUCTOR) <ul style="list-style-type: none">DESIGNED CURRICULUM & TAUGHT CONVOLUTIONS, FOURIER TRANSFORMS, & SAMPLING.EARNED 6.18/7 RATING FROM STUDENT EVALUATIONS (90 STUDENTS, 27 RESPONDED).	SPRING 2019
PSU	EE 350 CONTINUOUS LINEAR SYSTEMS (TA, 2 SECTIONS)	FALL 2015
PSU	EE 350 CONTINUOUS LINEAR SYSTEMS (TA, 2 SECTIONS)	SPRING 2015
ASU	MATH 270 CALCULUS 1 (TA, 3 SECTIONS)	FALL 2014
ASU	J. BUSTOZ MATH-SCIENCE HONORS PRGM INTRO TO MATH BIO (TA, 1 SECTION)	SUMMER 2014
ASU	MATH 270 CALCULUS 1 (TA, 2 SECTIONS)	SPRING 2014
ASU	PROGRAM TA MATHEMATICAL & THEORETICAL BIOLOGY INSTITUTE	SUMMER 2013
PITT	MATH 0010 COLLEGE ALGEBRA (TA, 2 SECTIONS)	FALL 2010

MENTORING & VOLUNTEER WORK

- Mentored ASU undergrad Christy Contreras in epidemiological modeling under Western Alliance to Expand Student Opportunities program from 2014-15. We worked towards and ultimately presented at an applied mathematics conference in 2015.
- Volunteered with the Salt River Project in 2015 to tutor Native American high school students in math and stats. Instruction involved teaching topics in abstract algebra, elementary mathematical modeling, & general mathematics deemed interesting.
- Mentored PSU undergraduates Neil Ashtkar & Michael O'Donnell concerning machine learning projects for radar time series data from summer 2018 until now. We focused on sequential algorithms in python to process the time series data.
- Recruited & advised ASU PhD student Albert Reed regarding physically-realistic GAN work in summer 2019. We worked towards complex-valued GAN architectures and published a conference paper regarding this work..