JACOB REINHOLD

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EDUCATION

Johns Hopkins University	M.S.E., Electrical and Computer Engineering GPA: 3.74/4.00	December 2019
The University of Texas at Austin	B.S., Electrical Engineering GPA: 3.75/4.00	December 2016

PROGRAMMING SKILLS: Proficient with Python (PyTorch, scikit-learn, numpy); Experience with C/C++, OCaml, SQL

EXPERIENCE

Image Analysis and Communication Lab, JHU ***Research Assistant*** Jan. 2018 – Present

- Used probabilistic programming language to implement a novel framework for asking counterfactual (causal) questions about multiple sclerosis (MS) images; improved MS lesion segmentation method with new deep network
- Developed novel unsupervised deep learning techniques to detect and segment anomalies in CT and MR images by quantifying uncertainty in an image-to-image translation task; resulted in two peer-reviewed conference papers
- Developed course material/held office hours for graduate-level course in information theory; completed coursework in high-dimensional statistics, Bayesian nonparametrics, machine learning, medical image analysis
- Created and maintained open-source software for medical image processing (180+ stars, 45+ forks on Github)
- Participating in competitive PhD program; qualified by completing oral and written technical tests

Neural Systems Analysis Lab, JHU ***Research Assistant*** Aug. 2017 – Dec. 2017

- Co-authored a peer-reviewed conference paper at a top speech-processing conference
- Collected a novel emotion-in-speech dataset and investigated ways to computationally alter emotional affect

Applied Research Laboratories, UT Austin ***Engineering Scientist Associate*** Nov. 2014 – Jun. 2017

- Initiated the development of a new software package which improved geolocation performance in dynamic atmospheric conditions using statistical array processing techniques on high-dimensional radio data
- Created mathematical models to analyze airplane and boat traffic from vehicle-emitted radio transmissions; techniques laid groundwork for new funding and research directions in the organization
- Analyzed scientific dataset by creating statistical software tools which resulted in a peer-reviewed conference presentation; visualizations were used in presentations delivered to funders and stakeholders

Biomedical Informatics Lab, UT Austin ***Research Assistant*** May 2016 – Aug. 2016

- Published two peer-reviewed papers on lesion detection in mammography images with a computational model

Advanced Mirco Devices, Inc. ***Co-op Engineer*** May 2014 – Aug. 2014

- Deployed tests to validate the functionality of processor memory on an in-development microprocessor
- Informed quality assurance team and management on a weekly basis by presenting test results in group meetings

United States Marine Corps Reserves ***Platoon Sergeant*** Jan. 2010 – Jan. 2018

- Meritoriously promoted to Sergeant; led 20+ junior marines (15+ junior enlisted, 5+ non-commissioned officers)
- Managed communication systems on 10+ convoy operations to outposts during a six-month tour in Afghanistan

SELECTED PUBLICATIONS

[1] J. Reinhold, et al. "A Structural Causal Model of MR Images of Multiple Sclerosis." arXiv:2103.03158 *(under review).*

[2] J. Reinhold, et al. "Validating uncertainty in medical image translation." IEEE ISBI 2020.

[3] J. Reinhold, et al. "Finding novelty with uncertainty." SPIE Medical Imaging 2020

[4] J. Reinhold, et al. "Evaluating the impact of intensity normalization on MR image synthesis." SPIE MI, 2019.

ADDITIONAL INFORMATION

Honors & Awards: Ferdinand Hamburger Jr. Fellowship, Raytheon-SVA Scholarship, Frederic and Julia Weigl Scholarship, Jean Perkins Combat Veteran Scholarship, Jerry A. and Martha Lel Hawkins Endowed Scholarship, nominated for Texas Exes Presidential Leadership award, invited member of IEEE Eta Kappa Nu (honor society)

Other Activities: Writer for "Towards Data Science" (three articles with over 25K reads, 58K views); project developer for Manning Publications (created educational deep learning course for medical image analysis)

Interests: Writing, open-source software, probabilistic programming languages, markets, reading non-fiction books

Work Eligibility: US Citizen; **Languages**: English Native, Basic French