Jacob Reinhold

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EDUCATION

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

TECHNICAL Python (PyTorch, numpy), OCaml, SQL, causal inference, experimental design, statistics, probability

EXPERIENCE

Meta *Research scientist* *Jun 2022 – Present*

- Developed OCaml package for performant causal structure learning that handles multi-modal/mixed data types
- Designed experiments to estimate causal effects of various products on business value and revenue
- Implemented observational causal inference methods to estimate effects when experiments were infeasible

Memorial Sloan Kettering Cancer Center *Data scientist* *Jul 2021 – Jun 2022*

- Developed a DNN-based tumor segmentation pipeline for precision medicine in collaboration with clinicians
- Used agile strategies to create pipeline infrastructure for training and deploying ML models (PyTorch, ONNX, OpenVINO) on AWS (e.g., EC2, S3, SageMaker, Lambda, ECS, RDS) with Docker, Packer, CloudFormation (CDK)
- Developed ML monitoring methods to evaluate model performance and dataset shift in deployment
- Built, developed, and deployed MLOps tools (MLFlow) and workflows to coordinate a team of data scientists

Image Analysis and Communication Lab, JHU *Graduate research assistant* *Jan 2018 – May 2021*

- Used probabilistic programming language to implement a novel causal model of disease for multiple sclerosis (MS) in MR images; provided machine learning expertise to large multi-disciplinary team of researchers
- Developed novel unsupervised anomaly detection technique in CT and MR images by quantifying uncertainty in an image-to-image translation task for an industry partner; resulted in two peer-reviewed conference papers
- Improved in-house MS lesion segmentation by researching, developing, and packaging a state-of-the-art DNN
- Developed course material/held office hours for graduate-level course in information theory

Neural Systems Analysis Lab, JHU *Graduate research assistant* *Aug 2017 – Dec 2017*

- Co-authored a peer-reviewed conference paper at a top speech-processing conference on emotion in speech

Applied Research Laboratories *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

US Marine Corps Reserves *Platoon Sergeant* *Jan 2010 – Jan 2018*

- Meritoriously promoted to Sergeant; led 20+ junior marines (15+ junior enlisted, 5+ non-commissioned officers)

SELECTED PUBLICATIONS

[1] J. Reinhold, et al. "A Structural Causal Model of MR Images of Multiple Sclerosis." MICCAI 2021.
[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

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

Other Activities: Writer for "Towards Data Science" (three articles with over 32K reads, 75K views); Writer for Innolitics (three articles about machine learning and medical imaging; made front page of Hacker News); project developer for Manning Publications (created educational deep learning course for medical image analysis);

Created and maintained open-source software for medical image analysis (**375+ stars on Github**)