

# Jacob Reinhold

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## EXPERIENCE

<b>Meta</b>	<i>Research scientist</i>	2022 – 2023
<ul style="list-style-type: none"><li>• Conducted rigorous statistical analyses to discover multiple \$20M+ revenue opportunities across Meta products</li><li>• Developed Python package to streamline causal inference with matching, doubly-robust IPW, and double ML</li><li>• Developed Python package to analytically solve for various experimental design parameters in meta-analyses</li><li>• Designed experiments to evaluate efficacy of new products combining observational and interventional data</li><li>• Developed OCaml package for performant causal structure learning that handles multi-modal/mixed data types</li></ul>		
<b>Memorial Sloan Kettering Cancer Center</b>	<i>Data scientist</i>	2021 – 2022
<ul style="list-style-type: none"><li>• Developed a DNN-based tumor segmentation pipeline for precision medicine in collaboration with clinicians</li><li>• 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)</li><li>• Developed ML monitoring methods to evaluate model performance and dataset shift in deployment</li><li>• Built, developed, and deployed MLOps tools (MLFlow) and workflows to coordinate a team of data scientists</li><li>• Established style guide and code review process on team of data scientists; wrote and deployed CI/CD pipelines</li></ul>		
<b>Johns Hopkins University</b>	<i>Graduate research assistant</i>	2017 – 2021
<ul style="list-style-type: none"><li>• 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</li><li>• 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</li><li>• Improved in-house MS lesion segmentation by researching, developing, and packaging a state-of-the-art DNN</li><li>• Developed course material/held office hours for graduate-level course in information theory</li><li>• Co-authored a peer-reviewed conference paper at a top speech-processing conference on emotion in speech</li></ul>		
<b>Applied Research Laboratories</b>	<i>Engineering scientist associate</i>	2014 – 2017
<ul style="list-style-type: none"><li>• 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</li></ul>		
<b>US Marine Corps Reserves</b>	<i>Platoon Sergeant</i>	2010 – 2018
<ul style="list-style-type: none"><li>• Meritoriously promoted to Sergeant; led 20+ junior marines (15+ junior enlisted, 5+ non-commissioned officers)</li></ul>		

## EDUCATION

<b>Johns Hopkins University</b>	M.S.E., Electrical and Computer Engineering	2019
<b>University of Texas at Austin</b>	B.S., Electrical Engineering	2016

**TECHNICAL** Python (PyTorch, scikit-learn), R, C++, OCaml, SQL, deep learning, computer vision, machine learning, graph/network data, causal inference, experimental design, statistics, cloud computing

## 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

**Other Activities:** [Writer for “Towards Data Science”](#) (three articles with over 40K reads, 90K views); [Writer for Innolitics](#) (three articles about [GANs](#), [image segmentation](#), [self-supervised learning](#); made front page of Hacker News); [project developer for Manning Publications](#) (created course on deep learning for medical image analysis).

Created and maintained open-source software for medical image analysis (400+ stars on [GitHub](#))