

## Experience

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### **Vice President of Machine Learning** - [ArthurAI](#) - 2020 to Present

- At Arthur, we've built the first model monitoring platform for the enterprise. Joined at seed stage, and helped build Arthur's capabilities and success with Fortune 50 customers. Helped grow company from 5 employees to over 50, from seed stage through Series B.
- Lead product strategy and the development of ML capabilities focused on Data Drift, Explainable AI, and Algorithmic Fairness and Bias Mitigation. Lead ML research, development of IP portfolio, and product integration.
- Built out teams and best practices for ML Sales Engineering and Customer Success. Work closely with our sales organization throughout the account lifecycle and engage with enterprise executive stakeholders as well as practitioner product users.

### **Director of Machine Learning Research** - Capital One - 2018 to 2020

- Built and led the ML Research team within the Center for Machine Learning. Worked with a phenomenal team to develop novel applications of ML in critical financial services areas such as [Explainable AI](#), [Graph Representation Learning](#), and [Computer Vision](#).
- Established and demonstrated the strategic importance of ML Research at Capital One by delivering publications at top conference and workshops, strong patent portfolio, and release of open source projects. Developed strong partnerships with business lines and oversaw the production deployment of novel ML systems in areas such as fraud, marketing, and security.

### **Machine Learning Engineer, Senior Manager** - Capital One - 2017 to 2018

- Led technical projects and provided modeling guidance in domains including time series anomaly detection, malware detection, and digital marketing using techniques such as Bayesian Multi-arm Bandits, Gaussian Process Regression, and convolutional networks.
- Worked with leadership team on the development and strategy of Capital One's Center for Machine Learning. Helped grow the Center from 10 employees to over 150 through recruiting, interviewing, and mentoring engineers and data scientists.

### **Co-founder and Chair** - CAMLIS - 2017 to Present

- The [Conference on Applied Machine Learning for Information Security](#) is an annual conference for discussing new developments in machine learning as applied to problems in cybersecurity and defense. The conference meets annually with ~200 person attendance, with hundreds more on live stream.
- Coordinate efforts in executing our annual event and serving our community. This includes securing corporate sponsorship, venue, program and speakers, and event management.

### **Data Scientist** - IronNet Cybersecurity - 2015 to 2017

- Worked with a team of brilliant data scientists and developers to build powerful algorithms for anomaly detection on computer networks.

### **Data Scientist** - L3 Data Tactics - 2014 to 2015

- Worked on DARPA program to build large-scale machine learning applications for cyber defense and anomaly detection.

# Education

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## University of Texas at Austin

PhD in Neuroscience, 2014

Doctoral Advisor: Richard W. Aldrich

## Washington and Lee University

BS in Physics, *magna cum laude*, 2009

# Teaching Experience

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## Adjunct Assistant Professor - Georgetown University - 2017 to 2021

- Develop and teach graduate coursework in Georgetown's [Masters in Data Science](#) program.
- *ANLY-512 Statistical Learning Theory*: topics include classification and regression, model evaluation, parametric and nonparametric methods, regularization, and unsupervised methods.
- *ANLY-590 Neural Networks and Deep Learning*: topics include artificial neural networks, optimization and gradient descent, backpropagation, convolutional neural networks, recurrent neural networks, autoencoders, embeddings, generative methods.

## Instructor - General Assembly - 2016 to 2017

- Lead instructor for GA's 12-week Data Science part-time course.
- Developed and taught course content surveying fundamental concepts in the Python data science ecosystem. Topics included software skills and git, scikitlearn and machine learning, model evaluation, natural language processing, clustering, neural networks, and distributed computing.

# Select Publications

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[Google Scholar](#)

Kwegyir-Aggrey, K, J. Dai, J. Dickerson, **K. Hines**. 2022. Achieving Downstream Fairness with Geometric Repair. *In Submission*. <https://arxiv.org/abs/2203.07490>

Kumar, I. E., **K. Hines**, J. Dickerson 2022. Equalizing Credit Opportunity in Algorithms: Aligning Algorithmic Fairness Research with U.S. Fair Lending Regulation. *AIES*.

Verma, S., **K. Hines**, J. Dickerson 2021. Amortized Generation of Sequential Counterfactual Explanations for Black-box Models AAAI. <https://arxiv.org/abs/2106.03962>

Verma, S., J. Dickerson, **K. Hines** 2020. Counterfactual Explanations for Machine Learning: A Review. *NeurIPS RSA Wkshp*. <https://arxiv.org/abs/2010.10596>. Best Paper Award.

C.B. Bruss, A. Khazane, J. Rider, R. Serpe, A. Gogoglou, **K. Hines** 2019. Embedding Graphs of Financial Transactions. *IEEE ICMLA*. <https://arxiv.org/pdf/1907.07225.pdf>. Spotlight Talk.

R. Sarshogh and **K. Hines**. 2019. A Multitask Network for Localization and Extraction of Text From Images. *IEEE ICDAR*. <https://arxiv.org/pdf/1906.09266.pdf>

**Hines, K.** 2015. A Primer On Bayesian Inference For Biophysical Systems. *Biophysical Journal*. 108(9) 2103-2113.

**Hines, K.**, J. Bankston, R. Aldrich. 2015. Analyzing Single Molecule Time Series Via Nonparametric Bayesian Inference. *Biophysical Journal*. 108(3) 540-556.

**Hines, K.**, T. Middendorf, R. Aldrich. 2014. Determination of Parameter Identifiability in Nonlinear Biophysical Models: A Bayesian Approach. *Journal of General Physiology*. 143(3):401-416.

**Hines, K.** 2013. Inferring Subunit Stoichiometry from Single Molecule Photobleaching. *Journal of General Physiology*. 141(6):737-746.