Taylor Faucett

Senior Machine Learning Engineer / Physicist

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Professional Summary

Senior Machine Learning Engineer and physicist specializing in computer vision, 3D spatial data, and robotics applications. Build research-grade models and infrastructure that carry ideas from exploratory analysis to reliable, real-time deployment on robotic hardware, owning the full pipeline from data generation through model design, evaluation, and edge deployment. Combine an academic background in machine learning for high-energy physics with industry experience to deliver interpretable, production-ready systems for complex, sensor-rich environments.

Education

2015 - 2021 | **University of California, Irvine**, Irvine, CA
Ph.D. in Physics

2011 - 2015 | **Univerity of Hawaii, Manoa**, Honolulu, HI
M.S. in Physics

2005 - 2009 | **Westminster College**, Salt Lake City, UT
B.S. in Physics, Minor in Mathematics and Music

Professional Experience

06/2022 - Present | **Machina Labs**
Senior Machine Learning Engineer
- Lead end-to-end ML for industrial robotic sheet-metal forming, from data collection and labeling to model design, evaluation, and deployment on edge devices.
- Develop real-time models for anomaly detection, geometry augmentation, and trajectory planning using time-series and 3D sensor data.
- Design data and experimentation infrastructure (data warehousing, ETL, metrics, dashboards) to support rapid iteration and robust monitoring of ML systems in production.
- Collaborate with robotics, controls, and software teams to integrate ML into safety-critical systems, including CI/CD and infrastructure-as-code for on-prem hardware.

06/2015 - 06/2022 | **University of California, Irvine**
Graduate Research Assistant & Postdoctoral Researcher
- Researched deep learning and computer vision methods for particle-physics detectors, focusing on robust classification, reconstruction, and anomaly detection under real-world constraints.
- Developed techniques for interpreting ML models and relating learned features to underlying physical mechanisms, improving trust and scientific insight.
- Built end-to-end ML pipelines for large simulated and experimental datasets, covering data generation, preprocessing, feature engineering, model design, hyperparameter optimization, and uncertainty-aware evaluation.
- Collaborated across international experimental collaborations and communicated ML results to both domain experts and non-specialists.

08/2011 - 05/2015 | **University of Hawaii, Manoa**
Graduate Research Assistant
- Designed and implemented numerical simulations of Bose–Einstein condensates for a DoD-funded lattice-gas quantum computing experiment, bridging physics models and high-performance code.
- Integrated analysis and trigger software with FPGA-based readout for a neutrino telescope, working across hardware, firmware, and scientific analysis teams.

09/2009 - 05/2011 | **Northrop Grumman Aerospace**

Systems Engineer
- Designed and deployed secure precision-time (PTP) radio networks for U.S. Air Force installations, focusing on reliability, timing accuracy, and security.
- Served as primary point of contact for network operations and reliability, tracking performance metrics and coordinating fixes with Air Force stakeholders.
- Held an active Secret security clearance.

Publications

1. Faucett, T. Decoding Black Box Models to Find New Physics at the LHC. Ph.D. Dissertation, University of California, Irvine (2021). https://escholarship.org/uc/item/63x9r13b
2. Faucett, T., Hsu, SC. & Whiteson, D. Learning to identify semi-visible jets. J. High Energ. Phys. 2022, 132 (2022). https://doi.org/10.1007/JHEP12(2022)132
3. Faucett, T., Thaler, J., Whiteson, D. Mapping machine-learned physics into a human-readable space. Phys. Rev. D 103, 036020 (2021). https://doi.org/10.1103/PhysRevD.103.036020
4. Collado, J., Faucett, T., Witkowski, E. et al. Learning to isolate muons. J. High Energ. Phys. 2021, 200 (2021). https://doi.org/10.1007/JHEP10(2021)200
5. Collado, J., Faucett, T., Howard, J. et al. Learning to identify electrons. Phys. Rev. D 103, 116028 (2021). https://doi.org/10.1103/PhysRevD.103.116028
6. Baldi, P., Cranmer, K., Faucett, T. et al. Parameterized neural networks for high-energy physics. Eur. Phys. J. C 76, 235 (2016). https://doi.org/10.1140/epjc/s10052-016-4099-4

Technical Skills

Languages	Python	●●●	Rust	●●○
	SQL	●●○	Bash/Shell	●●○
	C++	●○○		
ML/DL	PyTorch	●●●	NumPy	●●●
	Pandas/Polars	●●●	scikit-learn	●●●
	TensorFlow/Keras	●●○	ONNX	●●○
	MLflow	●●○	TensorBoard	●●○
Computer Vision	3D Point Cloud/Mesh	●●●	Image Processing	●●●
	Object Detection	●●○	OpenCV	●●○
	Material Modeling	●●○		
Robotics	ROS2	●●●	Edge/Embedded ML	●●○
	Real-time Systems	●●○		
Data & Cloud	Azure/Azure Gov	●●●	ETL Pipelines	●●●
	Kafka/RabbitMQ	●●●	Databricks	●●●
	PySpark	●●○	InfluxDB	●●○
DevOps	Docker	●●●	Kubernetes	●●○
	Terraform	●●○	CI/CD	●●●
	Linux/Unix	●●●	Git	●●●

Honors & Awards

2020 | **Chateaubriand Fellowship**, Chateaubriand Fellowship
Prestigious fellowship awarded by the French Embassy to support research in machine learning and AI at a leading French institution.

2016-2018 | **NRT-DESE: Team Science for Integrative Graduate Training in Data Science and Physical Science**, National Science Foundation
2 year NSF research grant for work in the interdisciplinary field of machine learning and the physical sciences.