Ross Everett Altman

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Summary

Full stack machine learning scientist/engineer with 6+ years of industry experience. Computational and mathematical physicist by training. Self-starter, lifelong learner, and teller of bad puns. Driven to build interdisciplinary knowledge with people of diverse experience to deliver impactful results. Solving hard problems through data, algorithms, teamwork, and strong research fundamentals.

Work Experience

Inari Agriculture *Cambridge, MA*

Machine Learning Scientist *Jan 2019 - Present*

- Co-led a four-person team developing a BERT-based protein language model to discover novel stability-enhancing mutations for improving efficiency of CRISPR-Cas proteins for genome editing in plants.
- Developed epistasis-aware DNA and protein language models to identify and prioritize high-impact deleterious mutations in sequenced corn varieties for correction via genome editing.
- Developed an approach using an ensemble of language models and bioinformatic methods to compute zero-shot predictions of the impact of complex mutations on endogenous protein function.
- Co-led a team of co-op students to develop the first genomic language model used for predicting tissue-specific gene expression in plants.
- Implemented internal-facing pipelines for non-computational lab scientists to run AlphaFold2/3 on proprietary protein sequences.
- Implemented a transfer learning approach to enrich single-cell RNA-seq data in data-poor species via joint embeddings with related species, and then infer tissue-specific gene regulatory networks.
- Developed a method for discovering causal interventions for trait improvement in soybean by scaling up AlphaFold2 for many-by-many protein-protein interaction screening.
- Mentored 8+ junior colleagues and interns, attended multiple conferences, facilitated meetings with scientific advisors, filed 5+ patents.

Insight Data Science *Boston, MA*

Fellow *Sept 2018 - Dec 2018*

- Implemented a Word2Vec model to enhance Wikipedia page previews by displaying the most relevant information to the current page.
- Used Wikipedia's bi-directional clickstream data to validate a 17% increase in relevance over default page previews.
- Built a Chrome browser extension served using a jQuery/Flask/AWS stack to achieve high performance on real-time, client-side data.

Northeastern University *Boston, MA*

Graduate Research Assistant *Sept 2011 - May 2017*

- Designed a modular, distributed algorithm in C++/Python to systematically compute type-IIB string theory vacuum states on an HPC cluster.
- Compiled the world's largest database of 10^5 string theory vacua, resulting in discovery of candidate universes extending the Standard Model.
- Estimated the number of vacua ($> 10^{(10^4)}$) in the string landscape using deep neural networks using specialized "equation learner" layers.
- Built and maintained a queryable web UI with MongoDB backend based on feedback from stakeholders in the string theory community.
- Co-founded the String Data group for ML applied to string theory, leading to international conferences and collaboration with industry.

Education

Northeastern University *Boston, MA*

PhD in Physics *Sept 2011 - May 2017*

- **Focus:** String theory/phenomenology, high-dimensional geometry, topology, computational methods, machine learning.

Cornell University *Ithaca, NY*

MEng in Applied Physics *Sept 2010 - May 2011*

Cornell University *Ithaca, NY*

BSc in Applied & Engineering Physics *Sept 2005 - May 2009*

Skills

Programming Languages Python, C/C++, Shell, HTML/CSS, JavaScript.
Machine Learning PyTorch, TensorFlow, Scikit-learn, Huggingface, Lightning, MLFlow.
Engineering Stack AWS, Docker, Kubernetes, Airflow, Flask/FastAPI, Terraform, MongoDB.
Technical Skills NLP, Computer Vision, Network Analysis, Statistics, Geometry/Topology, Bioinformatics, CICD.
Soft Skills Cross-functional Collaboration, Scientific Communication, Team/Project Leadership, Rapid Prototyping.

References available upon request.