Tobias Kreiman

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Education

UC Berkeley: PhD in Computer Science (August 2023 - Present)
- UC Berkeley Chancellor Fellowship 2023-2024

Columbia University: BA Computer Science and Physics (Graduation: May 2023) GPA: 3.99/4.0
- Dean's List 2019 - 2023
- Tamer Center Social Enterprise Summer Fellow 2020

Newton North High School (Graduation: June 2019) GPA: 4.859/5.0 (Weighted)

Relevant Courses: Multivariable Calculus, Linear Algebra, Discrete Math, Quantum Mechanics I and II, Thermal and Statistical Physics, Quantum Simulation and Computing, Data Structures and Algorithms, Computer Science Theory, Machine Learning, Computational Learning Theory, Geometric Data Analysis (Unsupervised and Manifold Learning), Computer Vision

Experience

TEACHING ASSISTANT, COLUMBIA UNIVERSITY (SEPTEMBER 2023 - MAY 2023)

1. **Recitation Instructor For John Parsons' Introduction to Electricity and Magnetism (PHYS 1602)**
   - Teaching and guiding students through problems and derivations about Electric Field and Potential, Gauss's law, circuits, magnetic fields, and more.
2. **TA for Professor Rocco Servedio's Computational Learning Theory (COMS 4252)**
   - Taught and guided students through proofs about PAC learning, VC dimension, Online Mistake Bounded Learning, Statistical Query Learning, AdaBoost, learning in the presence of noise, and more

MACHINE LEARNING INTERN, GOOGLE – (JUNE 2022 - AUGUST 2022)
- Embedded videos using multimodal joint audio-text model to learn musical genre
- Developed an online learning binary classifier to improve music autoplay recommendations on YouTube based on embeddings
- Integrated novel and advanced features into current training pipeline to increase accuracy and efficacy of models

MACHINE LEARNING RESEARCHER, COLUMBIA CIOCARLIE LAB – (SEPTEMBER 2021 - MAY 2023)

- Developed deep reinforcement neural networks to solve problems of robotic grasping and in hand manipulation
- Worked on novel Hardware as Policy techniques to co-optimize hardware and computational policy

MACHINE LEARNING INTERN, FACEBOOK – (JUNE 2021 - AUGUST 2021)

- Trained novel machine learning models based on multimodal features and billions of data points to recommend new podcast content
- Engineered features from visual, audio, and natural language text data
- Created new feature extraction pipeline that improved efficiency by 10x based on previous approaches

MACHINE LEARNING INTERN, SUPPORTIV – (JUNE 2020 - AUGUST 2020)

- Created both supervised and unsupervised machine learning models to classify and summarize text
- Analyzed modern literature dealing with transformer models and used transfer learning to improve accuracy on conversational dataset
- Constructed a Name Entity Recognition (NER) model to accelerate knowledge extraction pipeline

MACHINE LEARNING RESEARCH INTERN, MIT CENTER FOR BRAINS MINDS AND MACHINES – (SUMMER 2017, 2018)

- Developed new reinforcement learning algorithms to tackle "catastrophic forgetting" in neural networks, resulting in publication in peer reviewed journal
- Created efficient convolutional based neural networks to tackle the problem of object detection and feature point extraction on a mobile device
- Constructed a mobile application that created a 3D map around the user and communicated via vibrations, allowing a blind person to navigate

Skills

Machine Learning	Main Programming Languages
- Tensorflow (C++, Python), Pytorch, Keras	- Python (ML, Mujoco)
- Reinforcement Learning: DQN, PPO, In hand manipulation and grasping, Hardware as Policy	- Swift (iOS app development) - C++ - C

- Natural Language Processing: BERT Transformer for Named Entity Recognition, Multimodal embedding

- Computer Vision: Convolutional neural networks for realtime object detection and feature point extraction on phone, CNN for classification of recyclable objects

- Transfer Learning

- Java
- C# (Unity)

Languages

- English (Fluent)
- Spanish (Fluent)
- French (Proficient)

Publications

Kreiman T, Sasaki T, Bosch X. Artificial Intelligence Networks Towards Learning Without Forgetting. Journal of Emerging Investigators, 2018.

Honor and Fellowships

- UC Berkeley Chancellor Fellowship 2023-2024
- Dean's List at Columbia University 2019-2023
- Tamer Center Social Enterprise Summer Fellowship 2020
- Bausch and Lomb Honorary Science Award, 2018