Colton Stearns

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EDUCATION

Stanford University **September 2020 - TBD**

- Candidate for Ph.D. in Computer Science

Massachusetts Institute of Technology **September 2016 – May 2020**

- Bachelor of Science in Computer Science
- GPA: 4.9/5.0
- Relevant Coursework:
  - Applied Theory - Machine Learning (Graduate), Machine Learning (Undergrad), Shape Analysis (Graduate), Computer Graphics, Intro to Inference
  - Theory - Linear Algebra, Differential Equations, Probability, Discrete Mathematics, Multivariate Calculus
  - Computation - Design and Analysis of Algorithms, Computer Systems Engineering, Software Construction

INDUSTRY EXPERIENCE

Toyota Research Institute **June 2021 – August 2021**
Research Intern Los Altos, CA

- Researched new methods for 3D object tracking in autonomous vehicles
- Worked with the machine learning research team, spanning interests in simulation, real-time vision, and robotics planning

Second Genome **June 2020 – August 2020**
Research Intern South San Francisco, CA

- Researched machine learning in multi-omics data to predict the efficacy of PD-1 inhibitor drugs on melanoma skin cancer
- Surveyed and reproduced state-of-art methods for feature-cost-efficient-learning (weighted feature selection)
- Built an internal tool that utilizes feature-cost-efficient-learning in gradient boosted tree ensembles and SVMs

Nvidia **June 2019 – August 2019**
Computer Vision Intern Santa Clara, CA

- Worked on the Camera Localization team tasked with localizing a vehicle to an HD MAP with centimeter accuracy
- Collaborated to analyze, improve, and debug the camera localization algorithm in the production Driveworks SDK
- Gained experience with real time development in C++/CUDA, computational geometry, and probabilistic modeling

Aptiv (formerly Delphi Automotive) **June 2018 – August 2018**
Software Systems Intern Mountain View, CA

- Worked on the HD Mapping Team tasked with integrating map data into highway-autonomous vehicles
- Analyzed HD map latency, throughput, and accuracy bottlenecks; used my findings to help architect HD map data flow
- Gained experience with computational geometry, GNSS + IMU systems, and network communication protocols

RESEARCH EXPERIENCE

The Picower Institute for Learning and Memory **January 2019 - Present**
Alzheimer's Undergraduate Researcher Cambridge, MA

- Currently working on the human trials team in the Tsai Laboratory; we are tasked with evaluating the new Alzheimer's treatment GENUS (Gamma Entrainment Using Sensory Stimuli) in human subjects

- Developed computer vision software to track human compliance during the daily stimulations; my software uses machine learning eye-tracking methods to quantify human engagement with second-by-second granularity

MIT Media Lab: Fluid Interfaces **October 2017 – April 2018**
Augmented Reality Undergraduate Researcher Cambridge, MA

- Helped research, design, and build an augmented reality app for IOS devices and the Microsoft HoloLens
- Researched and applied constructionist learning techniques to intuitively teach introductory Newtonian physics

Koch Institute for Integrative Cancer Research **February 2017 – June 2017**
Computational Biology Undergraduate Researcher Cambridge, MA

- Collaborated in developing a Markov Chain Monte Carlo (MCMC) model to infer the rate of cell death, growth, apoptosis, and un-adherence given fluorescent data; observed successful convergence on experimental data

TOY PROJECTS

Term Project - Spline Parameter Estimation **September 2019 – December 2019**
Computer Graphics (6.837) Cambridge, MA

- Implemented substantial parts of a recent computer graphics paper that uses deep learning to estimate quadratic spline parameters of an image of a letter
- Reproduced the paper's results and verified that its proposed loss function performed as expected

Term Project - Generalizable Non-Rigid Registration **February 2019 – May 2019**
Advanced Topics in Computer Graphics: Shape Analysis (6.838) Cambridge, MA

- Implemented a research paper advocating multivariate kernel regression as a generalizable means of non-rigid registration
- Identified the paper's shortcomings in large 3D point clouds and presented an analysis on such failings

Term Project – Image Semantic Segmentation for Drivable Areas **September 2018 – December 2018**
Graduate Machine Learning (6.867) Cambridge, MA

- Developed a model to segment the Berkeley DeepDrive Dataset images into drivable and non-drivable area
- Model made use of a fully convolutional neural network for attribute recognition, a prior distribution to bias pixel-location, and a conditional random field for post processing and smoothing the drivable-area output

PATENTS

20200122738: *Vehicle System and Method for Steep Slope Pick-up and Drop-Off Site Avoidances* **October 19, 2018**

- Helped architect a vehicle system to alleviate fully autonomous vehicle drop off and pick up in steep-slope terrain

LANGUAGES / SKILLS

Computer Languages *(most to least fluent)*
Python, C++, Java, C#, MATLAB, Unity, Julia, LaTex, CUDA (familiar)

Languages
English *(first language)*, Spanish *(proficient)*

Skills *(most to least experienced)*
Machine Learning, Computational Geometry, Probabilistic Modeling, Machine Vision, Computer Graphics, Software Systems

FUN EXPERIENCES

NCAA Division III Men's Volleyball **September 2016 – October 2019**
Varsity Athlete Cambridge, MA

- Member of the varsity MIT men's volleyball team; I played outside hitter and libero