Ángel Alexander Cabrera

I am a PhD student in the Human Computer Interaction Institute (HCII) at Carnegie Mellon University, advised by Adam Perer and Jason Hong. My research focus is broadly **human-centered AI,** specifically in applying techniques from **HCI** and **visualization** to help people better understand and improve their machine learning models. I am supported by a NSF Graduate Research Fellowship.

Before CMU, I graduated with a B.S. in Computer Science from Georgia Tech where I worked with Polo Chau and Jamie Morgenstern. I've spent time at Microsoft Research and a few summers as a software engineering intern at Google working on Google Maps, Cloud Dataflow, and Android Auto.

cabreraalex.com

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GitHub

Google Scholar

Education

August 2019 - Present

PhD in Human-Computer Interaction (HCI)
Carnegie Mellon University
Advised by Adam Perer and Jason Hong.
Data Interaction Group

August 2015 - May 2019

B.S. in Computer Science
Georgia Institute of Technology
Concentration in intelligence and modeling/simulation.
Minor in economics.

Fall 2017

Sciences Po - Paris, France
Exchange program with a focus on economics and political science.

Work Experience

May 2020 - August 2020

Microsoft Research
Research Intern
Worked on behavioral model understanding with Steven Drucker and Marco Tulio Ribeiro.
VIDA Group

May 2018 - August 2018

Google
Software Engineering Intern
Researched and prototyped improvements for automated driver assistance systems and hyperlocal weather prediction for the next generation of Android Auto.
WSJ Article

May 2017 - August 2017

Google
Software Engineering Intern
Created an anomaly detection and trend analysis system for Google's data processing pipelines.

May 2016 - August 2016

Google
Engineering Practicum Intern
Built an analytics platform for monitoring and catching erroneous edits to Google Maps.

Awards

May 2019

National Science Foundation Graduate Research Fellowship (NSF GRFP)
Three-year graduate fellowship for independent research. Full tuition with an annual stipend of $34,000.
Website

May 2019

Love Family Foundation Scholarship
Co-awarded the $10,000 scholarship for the undergraduate with the most outstanding scholastic record.
Announcement

August 2015 - May 2019

Stamps President's Scholar
Georgia Tech and the Stamps Family Charitable Foundation
Full ride scholarship with $15,000 in extracurricular funding awarded to 10 incoming students.
Website

February 3, 2018

The Data Open Datathon
Correlation One and Citadel Securities
Placed third and won $2,500 for creating a ML system to predict dangerous road areas.
Press Release

Refereed Publications

December 2020

Regularizing Black-box Models for Improved Interpretability
Gregory Plumb, Maruan Al-Shedivat, **Ángel Alexander Cabrera**, Adam Perer, Eric Xing, Ameet Talwalkar
Conference on Neural Information Processing Systems (NeurIPS). Vancouver, 2020.
PDF Website

October 2020

Designing Alternative Representations of Confusion Matrices to Support Non-Expert Public Understanding of Algorithm Performance
Hong Shen, Haojian Jin, **Ángel Alexander Cabrera**, Adam Perer, Haiyi Zhu, Jason Hong
ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW). Virtual, 2020.
PDF Website

October 2019

FairVis: Visual Analytics for Discovering Intersectional Bias in Machine Learning
Ángel Alexander Cabrera, Will Epperson, Fred Hohman, Minsuk Kahng, Jamie Morgenstern, Duen Horng (Polo) Chau

IEEE Conference on Visual Analytics Science and Technology (VAST). Vancouver, Canada, 2019.

PDF Blog Video Demo Code Website

Workshops, Demos, Posters, and Preprints

May 2020 **"Public(s)-in-the-Loop": Facilitating Deliberation of Algorithmic Decisions in Contentious Public Policy Domains**
Hong Shen, **Ángel Alexander Cabrera**, Adam Perer, Jason Hong
Fair & Responsible AI Workshop at CHI. Hawaii, USA, 2020.

PDF Workshop Website

May 2019 **Discovery of Intersectional Bias in Machine Learning Using Automatic Subgroup Generation**
Ángel Alexander Cabrera, Minsuk Kahng, Fred Hohman, Jamie Morgenstern, Duen Horng (Polo) Chau
Debugging Machine Learning Models Workshop (Debug ML) at ICLR. New Orleans, Louisiana, USA, 2019.

PDF Workshop Website

June 2018 **Interactive Classification for Deep Learning Interpretation**
Ángel Alexander Cabrera, Fred Hohman, Jason Lin, Duen Horng (Polo) Chau
Demo at IEEE Computer Vision and Pattern Recognition (CVPR). Salt Lake City, Utah, USA, 2018.

PDF Video Demo Code Website

Teaching

Fall 2016
Spring 2017
Spring 2018 **CS1332 - Data Structures and Algorithms**
Undergraduate Teaching Assistant @ Georgia Tech
Taught a 1 1/2 hour weekly recitation, graded tests and homework, and helped create assignments.

Fall 2016 **GT 1000 - First-Year Seminar**
Team Leader @ Georgia Tech
Designed a class curriculum for incoming first years and helped lead a weekly seminar class.

Mentoring

Spring 2021 - Present **Kazi Jawad**
B.S. in Statistics and Machine Learning, Carnegie Mellon
Interactive tagging of images.

Spring 2020 - Present **Abraham Druck**
B.S. in Mathematical Sciences, Carnegie Mellon
Crowdsourced discovery of ML blind spots for image captioning.

Fall 2020
Spring 2020 CMU AI Mentoring Program

Service

Student Volunteer

October 2019 IEEE Visualization (VIS)

January 2019 ACM Fairness, Accountability, and Transparency (FAT*)

Reviewer

2021 ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)

2021 ACM Conference on Human Factors in Computing Systems (CHI)

2020 IEEE Visualization (VIS)

2019, 2020 IEEE Transactions on Visualization and Computer Graphics (TVCG)

2019 ACM Transactions on Interactive Intelligent Systems (TiiS)

Press

2020 "New forecasting data could help public health officials prepare for what's next in the coronavirus pandemic" - *CNN*

2020 "Facebook and Google Survey Data May Help Map Covid-19's Spread" - *Wired*

2020 "Carnegie Mellon Unveils Five Interactive COVID-19 Maps" - *Carnegie Mellon*

2020 "Visualizing Fairness in Machine Learning" - *Data Stories Podcast*

2019 "Alex Cabrera Wins Love Family Foundation Scholarship" - *GT SCS*

2019 "Georgia Tech Satellite Successfully Launched Into Space " - *Georgia Tech*

2018 "Datathon Challenges Students to Create Solutions to Real-World Problems" - *GT SCS*

Projects

Spring 2020 **COVIDCast Visualization of COVID Symptoms**

An interactive visualization for multiple indicators of COVID symptoms collected by the CMU Delphi research group.

Website

Fall 2018 **ICLR'19 Reproducibility Challenge**

Generative Adversarial Models for Learning Private and Fair Representations

Implemented and reproduced an ICLR'19 submission using GANs to decorrelate sensitive data.

GitHub

Spring 2018 **Georgia Tech Bus System Analysis**

System that combines Google Maps and graph algorithms to enable navigation for GT buses.

Poster Class

September 2015 - May 2017

PROX-1 Satellite

Flight Software Lead and Researcher

Led a team of engineers in developing the software for a fully undergraduate-led satellite mission.

In space! Website Press release

Spring 2014

CTF Resources

Guide and resources for capture the flag (CTF) competitions with over 1,000 stars on GitHub.

Website GitHub

Selected Classes

PhD

Causality and Machine Learning
Human Judgement and Decision Making
Applied Research Methods

B.S.

Deep Learning
Data and Visual Analytics
Machine Learning
Computer Simulation
Honors Algorithms