Matthew Hull

Ph.D. Student (ML + Simulation)

I am a Ph.D. student in Machine Learning at Georgia Tech advised by Duen Horng (Polo) Chau. My research focuses on adversarial machine learning and simulation with differentiable rendering. I've also been a professional pilot for 20+ years and currently captain the Boeing 767 at FedEx.

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Education

May. 2023 —	**Ph.D. in Machine Learning** Georgia Institute of Technology, Atlanta, GA
Jan. 2015 — May 2018	**M.S. in Computer Science** Georgia Institute of Technology, Atlanta, GA
Aug. 2000 — May 2004	**B.M. in Piano Performance** Samford University, Birmingham, AL

Academic Research Experience

June 2023 — Present	**Georgia Institute of Technology**, Atlanta, GA *PhD Researcher* PhD Researcher working on machine learning and data visualization projects.
May 2021 — May 2023	**Georgia Institute of Technology**, Atlanta, GA *Instructional Associate Researcher* Instructional Associate Researcher supporting teaching and research efforts.
May 2021 — May 2023	**Georgia Institute of Technology**, Atlanta, GA *Instructional Associate* Instructional Associate assisting in large-scale courses and academic projects.

Industry Experience

Aug. 2016 — Present	**FedEx Express**, Cologne, Germany | Oakland, CA *Pilot - Captain, Boeing 767 Aircraft* Captain on the Boeing 767 aircraft, responsible for international and domestic flight operations.

ExpressJet Airlines, Atlanta, GA

Manager - Advanced Qualification Program

Manager for the Advanced Qualification Program, overseeing pilot training data and compliance.

May 2007 — Dec. 2013
ExpressJet Airlines, Houston, TX

Lead Ground and Simulator Instructor

Lead Ground and Simulator Instructor for the Embraer 145 Aircraft, providing training for new and current pilots.

May 2006 — Aug. 2016
ExpressJet Airlines, Houston, TX

Pilot - Captain, Embraer 145 Aircraft

Captain on the Embraer 145 aircraft, responsible for regional airline operations.

Honors and Awards

2023
Google Research Award

Co-authored winning proposal for scaling up educators' capacities by automating visualization assessment via generative AI

2022
Outstanding Instructional Associate - Georgia Tech, College of Computing

As co-head TA of CSE 6242 - Data and Visual Analytics

2021
Best Poster Award at IEEE VIS Conference

For "Towards Automatic Grading of D3.js Visualizations"

Publications

Journal

J1
VisGrader: Automatic Grading of D3 Visualizations

Matthew Hull, Vivian Pednekar, Hannah Murray, Nimisha Roy, Emmanuel Tung, Susanta Routray, Connor Guerin, Justin Chen, Zijie J. Wang, Seongmin Lee, Mahdi Roozbahani, and Duen Horng Chau

IEEE Transactions on Visualization and Computer Graphics (TVCG), Melbourne, Australia, 2023.

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Conference

C1
RenderBender: A Survey on Adversarial Attacks Using Differentiable Rendering

Matthew Hull, Haoran Wang, Matthew Lau, Alec Helbling, Mansi Phute, Chao Zhang, Zsolt Kira, Willian Lunardi, Martin Andreoni, Wenke Lee, and Duen Horng Chau

International Joint Conference on Artificial Intelligence (IJCAI), Montréal, Canada, 2025.

🔗 Project   📄 PDF

C2 **Robust Principles: Architectural Design Principles for Adversarially Robust CNNs**
ShengYun Peng, Weilin Xu, Cory Cornelius, **Matthew Hull**, Kevin Li, Rahul Duggal, Mansi Phute, Jason Martin, and Duen Horng (Polo) Chau
British Machine Vision Conference (BMVC), Aberdeen, UK, 2023.

Project PDF Video Poster Code

C3 **Argo Lite: Open-Source Interactive Graph Exploration and Visualization in Browsers**
Siwei Li, Zhiyan Zhou, Anish Upadhayay, Omar Shaikh, Scott Freitas, Haekyu Park, Zijie J Wang, Susanta Routray, **Matthew Hull**, and Duen Horng Chau
Conference on Information and Knowledge Management (CIKM), Virtual, 2020.

Project PDF Code

Workshop

W1 **3D Gaussian Splat Vulnerabilities**
Matthew Hull, Haoyang Yang, Pratham Mehta, Mansi Phute, Aeree Cho, Haoran Wang, Matthew Lau, Wenke Lee, Willian Lunardi, Martin Andreoni, and Duen Horng Chau
CVPR Workshop on Neural Fields Beyond Conventional Cameras (NFBCC), Nashville, TN, 2025.

Project PDF Poster Code

Poster

P1 **Revamp: Automated Simulations of Adversarial Attacks on Arbitrary Objects in Realistic Scenes**
Matthew Hull and Zijie J. Wang and Duen Horng Chau
International Conference on Learning Representations (Tiny Papers at ICLR), Vienna, Austria, 2024.

Project PDF Video Code

P2 **LLM Self Defense**
Mansi Phute, Alec Helbling, **Matthew Hull**, ShengYun Peng, Sebastian Szyller, Cory Cornelius, and Duen Horng Chau
International Conference on Learning Representations (Tiny Papers at ICLR), Vienna, Austria, 2024.

Project PDF Code

P3 **Towards Automatic Grading of D3.js Visualizations**
Matthew Hull, Connor Guerin, Justin Chen, Susanta Routray, Duen Horng (Polo) Chau
IEEE Visualization Conference (VIS), Virtual, 2021.

Project PDF Video Poster

Preprint

P1   **ComplicitSplat: Downstream Models are Vulnerable to Blackbox Attacks by 3D Gaussian Splat Camouflages**
Matthew Hull, Haoyang Yang, Pratham Mehta, Mansi Phute, Aeree Cho, Haoran Wang, Matthew Lau, Wenke Lee, Willian Lunardi, Martin Andreoni, and Duen Horng Chau
arXiv, 2025.

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Talks

RenderBender: A Survey on Adversarial Attacks Using Differentiable Rendering

Aug. 2025   International Joint Conference on Artificial Intelligence

Oct. 2024   Georgia Tech Ph.D. Qualifying Oral Exam

REVAMP: Automated Simulations of Adversarial Attacks on Arbitrary Objects in Realistic Scenes

Feb. 2024   2nd Workshop on Deployable AI (DAI) at AAAI

VisGrader: Automatic Grading of D3 Visualizations

Oct. 2023   IEEE Visualization

Flying Cargo During the COVID-19 Pandemic

Sep. 2022   Palo Alto University Rotary Club, Palo Alto, CA, USA

Line Oriented Evaluation Design

Oct. 2015   Advanced Qualification Program Working Group, Las Vegas, NV, USA

Tactical Reporting of Advanced Qualification Program Training Data

Apr. 2015   World Airline Training Symposium, Orlando, FL, USA

Reason Code & Instructor Comments Data Analysis Methodology

Feb. 2015   Advanced Qualification Program Working Group, Dallas, TX, USA

Teaching

Aug. 2019 - Present   **Georgia Institute of Technology**, Atlanta, GA
Head Teaching Assistant / Instructional Associate — Data and Visual Analytics (CSE 6242)
Served as Head Teaching Assistant and Instructional Associate for Data and Visual Analytics (CSE 6242), coordinating course logistics, managing teaching staff, and supporting 1200+ students each semester.

Aug. 2018 - May 2019   **Georgia Institute of Technology**, Atlanta, GA
Teaching Assistant / Instructional Associate — Data and Visual Analytics (CSE 6242)

Served as Teaching Assistant and Instructional Associate for Data and Visual Analytics (CSE 6242), supporting 900+ students each semester with assignments, office hours, and project mentoring.

Jan. 2018 - May. 2018   **Georgia Institute of Technology**, Atlanta, GA
Graduate Teaching Assistant — Data and Visual Analytics (CSE 6242)
Graduate Teaching Assistant for Data and Visual Analytics (CSE 6242), mentoring student teams, holding office hours, and assisting with coursework for 800+ students.

Jan. 2016 - Aug. 2016   **ExpressJet Airlines**, Houston, TX
Simulator Instructor — Embraer 145 Aircraft
Simulator Instructor for the Embraer 145 Aircraft, conducting training sessions for pilots on flight operations and procedures.

Jan. 2012 - Dec. 2013   **ExpressJet Airlines**, Houston, TX
Lead Ground Instructor — Embraer 145 Aircraft
Lead Ground Instructor for the Embraer 145 Aircraft, overseeing curriculum development and conducting classroom training for pilot trainees.

Jul. 2007 - Dec. 2012   **ExpressJet Airlines**, Houston, TX
Ground Instructor — Embraer 145 Aircraft
Ground Instructor for the Embraer 145 Aircraft, delivering ground school lessons on aircraft systems and operations.

Service

Reviewer

Conference on Vision and Pattern Recognition (CVPR) (**CVPR**) 2026

International Joint Conference on Artificial Intelligence (IJCAI) (**IJCAI**) 2025

ACM International Conference on Information & Knowledge Management (CIKM) (**CIKM**) 2020

Member

2021 — Present   Institute of Electrical and Electronics Engineers (**IEEE**)

Certifications

Boeing 757 / 767 Type Rating

Boeing 737 Type Rating

Embraer 135/145 Type Rating

Airline Transport Pilot

Certified Flight Instructor - Single Engine, Multi Engine, Instrument

Remote Pilot - Small Unmanned Aircraft Systems

References

Dr. Polo Chau, Professor
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Dr. Mahdi Roozbahani, Lecturer
School of Computational Science and Engineering
Georgia Institute of Technology
cse.gatech.edu/people/mahdi-roozbahani/

James Barbour, Director - Flight Standards and Training
Flight Standards and Training
Avelo Airlines