Alina Jade Barnett

alina.barnett@duke.edu
https://alinajadebarnett.github.io/

RESEARCH INTERESTS

I build interpretable deep learning systems with applications in computer vision and clinical medicine. I have published papers in NeurIPS spotlight, CVPR, Nature Machine Intelligence, and SPIE Medical Imaging. I was PI for a $19,831 grant from the Duke Incubation Fund for interdisciplinary work on interpretable mammogram analysis. I have many academic awards, and a long history of service positions.

EDUCATION

Duke University — Durham, NC
Postdoctoral Research Associate (Advisor: Cynthia Rudin) — 2023 – current

Duke University — Durham, NC
Ph.D. in Computer Science (Advisor: Cynthia Rudin) — 2017 – 2023
M.S. in Computer Science (in passing)

McMaster University — Hamilton, ON, Canada
H.B.Sc. in Physics with co-op (summa cum laude) — 2012 – 2017

PUBLICATIONS

(* indicates co-first /co-senior authors, equal contribution)

[1] **Alina Jade Barnett**, Fides Regina Schwartz, Chaofan Tao, Chaofan Chen, Yinhao Ren, Joseph Lo, Cynthia Rudin. "A Case-based Interpretable Deep Learning Model for Classification of Mass Lesions in Digital Mammography."
*Nature Machine Intelligence (**NMI**)*, 2021.

[2] Jon Donnelly, **Alina Jade Barnett**, Chaofan Chen. "Deformable ProtoPNet: An Interpretable Image Classifier Using Deformable Prototypes."
*Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. (**CVPR**)*, 2022.

[3] Yanchen Jessie Ou*, **Alina Jade Barnett***, Anika Mitra*, Fides Regina Schwartz, Chaofan Chen, Lars Grimm, Joseph Lo, Cynthia Rudin. "A User Interface to Communicate Interpretable AI Decisions to Radiologists."
*Medical Imaging: Image Perception, Observer Performance, and Technology Assessment (**SPIE**)*, 2023.

[4] **Alina Jade Barnett**, Vaibhav Sharma, Neel Gajjar, Jerry Fang, Fides Regina Schwartz, Chaofan Chen, Joseph Lo, Cynthia Rudin. "Interpretable Deep Learning Models for Better Clinician-AI Communication in Clinical Mammography."
*Medical Imaging: Image Perception, Observer Performance, and Technology Assessment (**SPIE**)*, 2022.

[5] **Alina Jade Barnett**, Fides Regina Schwartz, Chaofan Tao, Chaofan Chen, Yinhao Ren, Joseph Lo, Cynthia Rudin. "Interpretable Mammographic Image Classification using Cased-Based Reasoning and Deep Learning."
***IJCAI**-21 Workshop on Deep Learning, Case-Based Reasoning, and AutoML: Present and Future Synergies*, 2021.

[6] Chaofan Chen*, Oscar Li*, Chaofan Tao, **Alina Jade** Barnett, Jonathan Su, Cynthia Rudin. "This Looks Like That: Deep Learning for Interpretable Image Recognition."
*Advances in Neural Information Processing Systems 32 (**NeurIPS Spotlight**)*, 2019.

[7] Dennis Tang, Frank Willard, Ronan Tegerdine, Luke Triplett, Jon Donnelly, Luke Moffett, Lesia Semenova, **Alina Jade Barnett**, Jin Jing, Cynthia Rudin, Brandon

Westover. "ProtoEEGNet: an interpretable approach for detecting interictal epileptiform discharges." *Medical Imaging meets NeurIPS workshop,* 2023.

UNDER REVIEW

[8] **Alina Jade Barnett***, Zhicheng Guo*, Jin Jing*, Wendong Ge, Brandon Westover, Cynthia Rudin. "Improving Clinician Performance in Classification of EEG Patterns on the Ictal-Interictal-Injury Continuum using Interpretable Machine Learning." 2023.

[9] Jon Donnelly, Luke Moffett, **Alina Jade Barnett,** Hari Trivedi, Fides Schwartz, Joseph Lo*, Cynthia Rudin*. "AsymMirai: Interpretable Breast Cancer Risk Prediction from Mammograms." 2023.

[10] Vaibhav Sharma, Sangwook Cheon, Giyoung Kim, Julia Yang, **Alina Jade Barnett**, Neal Hall, Avivah Wang, Fides Regina Schwartz, Chaofan Chen, Lars Grimm, Joseph Lo Cynthia Rudin. "Active Learning and Pseudo Labeling for Breast Mass Segmentation in 2D Digital Mammography." 2023.

GRANTS

PI: PI for $19,831.00 Duke Incubation Fund Award from the Duke Innovation & Entrepreneurship Initiative. A multi-department interdisciplinary project for superior interpretability on neural networks that analyze mammograms. 2019–2021

INVITED TALKS

JSM IOL Tutorial (jointly)	2023
INFORMS Annual Meeting	2022
Responsible Machine Learning	2021
Energy Data Analytics Symposium	2020
Canadian Undergraduate Physics Conference (1st place poster award)	2016
Canadian Association of Physicists Congress	2014
Canadian Undergraduate Physics Conference (2nd place talk award)	2014
Annual Soft-Condensed Matter and Biophysics Retreat	2013

SELECTED AWARDS

AI for Art, Duke University $2500: A competition for art made using AI	2019
TRIPODS Fellowship	2021
Energy Data Analytics Fellowship	2019–2021
SAMSI Fellowship	2019
Ph.D. Fellowship, Duke Computer Science	2017–2018
NSERC IUSRA Natural Sciences & Engineering Research Council Industrial Undergraduate Student Research Award	2015
NSERC USRA Natural Sciences & Engineering Research Council Undergraduate Student Research Award	2014
The Catherine & Albert Roeder Memorial Scholarship (highest cumulative average in Honours Physics)	2014

TEACHING

Co-Instructor, Graduate Theory and Algorithms for Machine Learning 671D	Fall 2023
TA, Graduate Artificial Intelligence	Fall 2018
TA, Undergraduate Artificial Intelligence	Spring 2018
TA, Physics for the Life Sciences	Fall 2014
Private Tutoring	2010–2016, 2020– present

MENTORING

Yanchen Jessie Ou (now at Meta)
Jon Donnelly (now PhD student at Duke)
Chaofan (Daniel) Tao (now at Meta)
Lei Chen (now at HP Labs)
Satvik Kishore (now at Cargill)
Julia Yang

CS+ Mentoring 2020–2023:
Vaibhav Sharma
Anika Mitra
Jerry Fang
Neel Gajjar
Celeste A'Brassard

Frankie Willard
Dennis Tang
Rohan Bhansali
Ronan Tegerdine
Zhicheng Guo

SELECTED SERVICE

Reviewer: CVPR 2023, WACV 2023, ICCV, AIES, various other journals, several interpretability/explainability workshops	2018–2023
CS+ Speaker and Mentor	2020–2023
Graduate Student Affairs Student Liaison	2018–2023
Panel Member for Women in Computer Science Events	2018–2023
CS Social Committee: Co-chair; Chair; Alcohol Coordinator	2018–2021
Hiring Committee for Department Administrative Staff Members	2018; 2021
Office of Institutional Equity: Harassment Grievance Appeals Board Member; Harassment Grievance Board Member	2017–2020
Graduate and Professional School Council Special Parking Task Force	2019–2020
Mentor for LLC Ladies Learning Code	2017
Physics Talk Judge for Canadian Undergraduate Physics Conference	2017
Physics Outreach Volunteer, Lab Demonstrator	2013–2017
Science & Engineering Fair Judge	2014

PROFESSIONAL EXPERIENCE

Kitware Inc. — Clifton Park, NY
Research Internship — 05/2019 – 08/2019
DARPA XAI Explanations for content-based image retrieval.

Government of Canada — Ottawa, ON
Software Systems Developer Internship — 09/2016 – 12/2016

McMaster University, Brockhouse Institute of Materials Research — Hamilton, ON
Undergraduate Researcher — 04/2016 – 08/2016

Sidense Corp. — Kanata, ON
Research & Development Internship — 05/2015 – 08/2015

E-One Moli Energy — Maple Ridge, BC
NSERC IUSRA Researcher — 01/2015 – 04/2015

University of Toronto, Icicle Growth Lab — Toronto, ON
NSERC USRA Researcher — 04/2014 – 08/2014