Bradon Thymes

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EDUCATION

Cornell University   Expected graduation: May 2027
Ph.D. Student in Computer Science   Ithaca, NY

Howard University, GPA: 3.74 (Magna Cum Laude)   Aug. 2018 – May 2022
Bachelor of Science in Computer Science   Washington, DC

PUBLICATIONS & PREPRINTS

Publications

- W. Guo, A. Wang, **B. Thymes**, T. Joachims. 2024. Ranking with Slot Constraints. In Proceedings of the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '24). Association for Computing Machinery, New York, NY, USA, 956967. https://doi.org/10.1145/3637528.3672000
- N. Scott, **B. Thymes**, J. Salisbury (2023). Statistical Modelling of Air-Ground Remotely Sensed Geo-Intelligence Information Using Naïve Bayesian Classification: A Decision-Making Approach. 10.11159/mvml23.102.
- N. Scott, **B. Thymes**, J. Salisbury (2023). Dempster-Shafer Evidential Theory Belief Amalgamation and Dynamic Programming Supporting Soldier Squadron Adversarial Engagement: Simulation-Based Decision-Making. 10.11159/mvml23.103.
- J. Lee, **B. Thymes**, J. Zhou, T. Joachims, R. Kizilcec, Augmenting Holistic Review in University Admission using Natural Language Processing for Essays and Recommendation Letters   https://arxiv.org/abs/2306.17575
- M. Munje, L. Teran, **B. Thymes**, J. Salisbury, TEAM3 Challenge: Tasks for Multi-Human and Multi-Robot Collaboration with Voice and Gestures   https://dl.acm.org/doi/10.1145/3568294.3580049
- L. Van Dammen, N. Barnett, R. Conrady, L. Wright, **B. Thymes**, E. Shirtcliff. Evoking Stress Reactivity in a Virtual Dance Competition. Advances in Simulation and Digital Human Modeling, vol. 1206, 2020, pp. 4855., https://par.nsf.gov/servlets/purl/10224738.

Preprints

- S. Dooley, R. Downing, G. Wei, N. Shankar, **B. Thymes**, G. Thorkelsdottir, T. Kurtz-Miott, R. Mattson, O. Obiwumi, V. Cherepanova, M. Goldblum, J. Dickerson, T. Goldstein. Comparing Human and Machine Bias in Face Recognition. *ArXiv.org*, Cornell University, 25 Oct. 2021, https://arxiv.org/pdf/2110.08396v2.pdf.

RESEARCH EXPERIENCE

Cornell University   Aug. 2022 – Present
Graduate Research Assistant   Ithaca, NY

- Multilabel Classification of Student Admission Essays
  - ∗ Designed and implemented a multilabel classification system to extract attributes from student admission essays, utilizing T5 for generating tags.
  - ∗ Troubleshot and addressed challenges with imbalanced labeling across 30 attributes, where only 5 labels were significantly represented.
  - ∗ Analyzed and optimized preprocessing techniques to improve label representation and mitigate imbalanced data issues.
  - ∗ Gained valuable experience in handling imbalanced datasets and understanding the practical challenges of applying NLP to real-world problems.
- Speaker-Aware Video Understanding
  - ∗ Currently developing a speaker diarization and name attribution pipeline as a foundational component of a larger speaker-aware video understanding system.

* Implemented a pipeline using WhisperX for generating transcripts with sentence-level timestamps, enabling alignment of speech with visual and audio features.
* Designed a clustering-based approach utilizing ECAPA-TDNN for speaker embeddings, combined with CNN-based facial feature extraction to match speakers to their visual representations.
* Collaborating on the creation of a video question-answering dataset structured to challenge LLMs with questions requiring either audio information, visual information, or both.

Riverside Research   May 2022 – Aug. 2022
Machine Learning Intern (GEM Fellow)   Lexington, MA

Worked on research project involving human-robot collaboration using the game TEAM3.

* Created a dataset for the TEAM3 blocks placed in different orientations
* Finetuned a pretrained ResNet50 model to detect TEAM3 blocks in different orientations
* Contributed to a set of path planning algorithms for Sawyer robotic arm to build block towers

Amazon Voice FAQ   Sep. 2021 – May 2022
Research Intern   Washington, DC

Joint research project with Howard University and Amazon which seeks to assess cognitive decline through vocal prosody and facial expressions

* Utilized PyAudio to record audio from the users
* Reduced noise in audio by utilizing SciPy to create a high-pass filer
* Utilizing the SpeechBrain toolkit to detect intonation of the users

University of Maryland Combinatorics and Algorithms for Real Problems (REU-CAAR)June 2021 – May 2022
Research Intern   Remote

Worked on two separate research projects over the course of the summer:

Bias in Facial Recognition:

* S. Dooley, R. Downing, G. Wei, N. Shankar, **B. Thymes**, G. Thorkelsdottir, T. Kurtz-Miott, R. Mattson, O. Obiwumi, V. Cherepanova, M. Goldblum, J. Dickerson, T. Goldstein. Comparing Human and Machine Bias in Face Recognition. *ArXiv.org*, Cornell University, 25 Oct. 2021, https://arxiv.org/pdf/2110.08396v2.pdf.
* Conducted research to gain a better understanding of what biases facial recognition models have compared to human biases
* Participated in curating a dataset from the Labeled Faces in the Wild and Celeb A facial recognition datasets
* Labelled each individuals Fitzpatrick skin type, country of origin, birth date, as well as, their gender presentation
* Worked on a Flask application to test human users accuracy and biases compared to facial recognition systems
* Worked on user verification test, where a person would compare two images to one another and determine if that person was the same individual
* Worked on the user details section, where the participant identified their age, gender presentation, and Fitzpatrick skin type
* Worked on website organization, using Flask sessions to route user to the verification, identification and user-details pages

Organizational Team Formation:

* Worked on formulating a problem statement
* Reviewed psychology team formation literature to determine the best way to optimize teams in a real-world environment
* Reworking original formulation in order to apply a reinforcement learning approach to the original problem

Howard University College of Engineering and Architecture   Aug. 2021 – May 2022
Teaching Assistant   Washington, DC

* Teaching Assistant for the course entitled, Introduction to Computer Science - CSCI-100 with Alex Krentsel
* Duties include grading papers, tutoring, hosting office hours, assisting in creating and delivering learning material, contributing input on exam content, proctoring exams and lecturing occasional classes

Iowa State University SPIRE-EIT   May 2019 – Aug. 2019
Virtual Reality Research Intern   Ames, IA

Through a Research Experiences for Undergraduates (REU) program, I worked with the Stress Physiology Investigative Team (SPIT) Lab at Iowa State University. Our task was to create a stress response in virtual reality:

* L. Van Dammen, N. Barnett, R. Conrady, L. Wright, **B. Thymes**, E. Shirtcliff. Evoking Stress Reactivity in a Virtual Dance Competition. Advances in Simulation and Digital Human Modeling, vol. 1206, 2020, pp. 4855., https://par.nsf.gov/servlets/purl/10224738.
* Oversaw the experiment on all eighteen participants, including confirming data accuracy by running a control task
* Researched psychology publications to identify and determine causes of increased cortisol levels
* Programmed the music manager, light manager and audience in C# to create a task where the user has to perform a dance in virtual reality meant to trigger a stress response in virtual reality
* Implemented dancing animations and scripts using Unity animator controllers
* Analyzed physiological data such as heart rate variability (HRV) and respiratory sinus arrhythmia (RSA) using MindWare Technologies software

RELEVANT PROJECTS

evn, Group Project (Bison Hacks 2021)
* Created a React application designed to remove unconscious bias from the hiring process such as race, gender, physical attributes, etc.
* Built the user interface utilizing the react-bootstrap library
* Created a presentation outlining our value proposition, streams of revenue, and channels of growth
* Designed the user interface mockup in Figma

CopiKat, Group Project (Google DC Hack)
* Won 2nd Place Prize in the main track of the Hackathon
* Allowed the user to utilize the Android camera, so that they could take a picture to access the image recognition feature of the app, by using the CameraKit API and Java

CaloriKat, Group Project (Bison Hacks 2019)
* Won 3rd place prize for the main track of the Hackathon
* Used Android studio to develop an application that determines the type of food the user took a picture of, and gives the calorie count of that object
* Built the user interface for the application using Java and XML
* Helped to develop the website that proposed our business model

SKILLS

Python, PyTorch, C++, C#, JavaScript, HTML/CSS, Java, LaTeX

VOLUNTEERING, FELLOWSHIPS, AWARDS, AND INTERESTS

Cornell SoNIC Program   June 2024
RA & TA
* Program designed to help students learn about a variety of state-of-the-art computing research directions happening at Cornell University and beyond, and get an opportunity to conduct a short research project.
* Introduced students to multimodal LLMs and gave guidance on the direction of their projects.

Cornell University CS Visit Day   Mar. 2024
Volunteer

CodeAfrique   Jan. 2024
Mentor
* Program designed to help students in Ghana gain a window into the field of Computer Science
* Taught students the fundamentals of Python and HTML, going over concepts such as functions, variables, loops and if-else statements

GEM Fellowship   Aug. 2022
Recipient

Cornell University Hopper Dean/Bowers CIS Deans Excellence Fellowship   Aug. 2022
Recipient

International Conference on Applied Human Factors and Ergonomics (AHFE) 2020 Best Paper   Jul. 2020
Winner
  * Awarded Best Paper of 2020 for research paper *Evoking Stress Reactivity in a Virtual Dance Competition*
  * Written at Iowa State University during Summer 2019 internship

Karsh STEM Scholars Program
Member
  * Selected to be one of 29 students to be a part of the second cohort of Howard University's research PhD track development program
  * Participated in a summer bridge program on college success, research, and public speaking seminars
  * Engaged in activities that promoted group collaboration skills

Tau Beta Pi   May 2022 – Present
Member   Washington, DC

Upsilon Pi Epsilon   Mar. 2021 – Present
Member   Washington, DC

National Society of Black Engineers (NSBE)   Fall 2018 – Present
Member   Washington, DC

NSBE Jr.   Sep. 2018 – May 2019
Mentor   Washington, DC
  * Mentor for Tri-Math-a-Lon, VEX Robotics, and First Lego League
  * Dedicated to mentoring and tutoring young Black students in the greater D.C. area

Microsoft Code Academy   Dec. 2018 – May 2019
Mentor   Washington, DC
  * Taught a bimonthly class of secondary school students the principles of programming with the help of Microsoft employees
  * Provided mentoring and guidance to students outside the classroom

Association for Computing Machinery   Fall 2019 – Present
Member   Washington, DC