

AMAN BHATTA

18083 Bulla Rd ◇ SouthBend ◇ IN ◇ 46637
662-380-6700 ◇ abhatta@nd.edu ◇ [Personal Website](#)

RESEARCH INTERESTS

My primary research interest is in the broader field of explainable/responsible AI, where the main goal is to understand why deep-learning networks behave the way they do and how to mitigate their adversarial outcomes before deployment at scale. Currently, My research work is focused on face recognition where I try to understand the causes behind the accuracy differentials across different demographic groups and try to mitigate them.

EDUCATION

The University of Notre Dame Ph.D. in Computer Science and Engineering	Aug 2021 - Present GPA : 4.0
The University of Mississippi B.S(Hons) in Mechanical Engineering Minor : Computer Science & Mathematics	Graduated: May 2021 GPA : 3.96

PUBLICATIONS

1. **Aman Bhatta**, Vtor Albiero, Kevin W Bowyer, and Michael C King. The Gender Gap in Face Recognition Accuracy Is a Hairy Problem. In: Winter Conference on Applications of Computer Vision(WACV) Workshops. 2022.
2. **Aman Bhatta**, Gabriella Pangelinan, Michael C. King, Kevin W. Bowyer. Demographic Disparities in 1-to-Many Facial Identification. 2022. (In Review)
3. Wes Robbins*, Steven Zhou*, **Aman Bhatta**, Chad Mello, Vitor Albiero, Kevin W. Bowyer, and Terrence E. Boulton. CAST: Conditional Attribute Subsampling Toolkit for Fine-grained Evaluation. In: Winter Conference on Applications of Computer Vision(WACV). 2022.
4. Haiyu Wu, Grace Bezold, **Aman Bhatta**, Kevin W. Bowyer. Logical Consistency and Greater Descriptive Power for Facial Hair Attribute Learning. 2022. (In Review)

EXPERIENCE

Graduate Research Assistant <i>Advisor: Dr. Kevin W. Bowyer</i>	August 2021 - Present <i>University of Notre Dame</i>
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- **Primary**

- ✓ Identified the cause of gender gap in face recognition accuracy. Please refer to this Paper [1](#)
- ✓ Analyzed the presence of demographic differentials in 1-to-many search in the closed-set scenario. Showed that accuracy on the identification search is function of number of identities and the number of images per identity enrolled in the gallery. Please refer to this Paper [2](#)

- **Co-authorship**

- ✓ Proposed a new toolkit that efficiently filters data given an arbitrary number of conditions for metadata attributes that allows researchers to test their models on the targeted test distributions. Please refer to this Paper [3](#)

- ✓ Proposed a logically consistent prediction loss to aid learning of logical consistency across different facial hair attributes. Please refer to this [Paper 4](#)

Project Engineering Co-op
ThyssenKrupp Elevators Co.

January 2019 - May 2020
Middleton, TN

- **Major Tasks**

- ✓ Worked alongside Manufacturing Engineers and Software Implementation Engineers in the **Configure to Deliver(C2D)** project to parametrize components of elevator systems and to revamp the Data Base Management Suite
- ✓ Designed an algorithm to detect anomaly and thus predict the failure of the Salvagnini P4 panel bender machine. Built a **Data Visualization Web Application** using Python Framework Dash to exhibit failure statistics, which allowed effective mobilization of maintenance staff
- ✓ Ensured the manufacturing feasibility of recently parametrized parts and issued manufacturing test cases for software implementation engineers to ensure part-assembly compatibility and to automate the production of parametrized assemblies

- **Ancillary Tasks**

- ✓ Assisted a Senior Engineer to write a proposal to design and implement a new packaging for Elevator Cabin Door Assembly. The project had an estimated savings of \$450K per annum and 30% reduction in storage space
- ✓ Designed tools and fixtures to improve the efficiency of manufacturing lines
- ✓ Created and updated the Standard Operation Procedures for independent work flow processes
- ✓ Performed a capacity and time study of various assembly processes in the manufacturing facility

TECHNICAL SKILLS

Languages	—	Python, Java, C, C++
ML frameworks	—	Pytorch, Keras, Tensorflow
Markup	—	HTML, CSS, \LaTeX
Databases	—	MySQL, MongoDB, OracleDB
Tools	—	Git, MATLAB, Mathematica, COMSOL, PTC Creo
Web	—	AWS, WordPress, [Twilio, Google] API

RELEVANT MOOC CERTIFICATIONS

Coursera

<i>Mathematics for Machine Learning</i>	<i>Certificate</i>
<i>Generative Adversarial Network(GANs) Specialization</i>	<i>In Progress</i>
<i>Deep Learning Specialization</i>	<i>In Progress</i>

edX

<i>C Programming</i>	<i>Certificate</i>
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Udemy

<i>Python for Computer Vision</i>	<i>Certificate</i>
<i>Complete Java BootCamp</i>	<i>Certificate</i>
<i>Complete SQL BootCamp</i>	<i>Certificate</i>

UNDERGRADUATE ACADEMIC RESEARCH EXPERIENCE

Thermal and Fluid Science Lab

The University of Mississippi Mechanical Engineering Department

June 2018 - January 2019

Advisor: Dr. Taiho Yeom

- Devised an efficient heat transfer system using piezoelectric agitators and micro pin fin arrays
- Simulated a channel flow system using COMSOL multi-physics software to study convective heat transfer enhancement
- Troubleshoot the lab equipment and computer systems

Microbiology Lab

The University of Mississippi Biology Department

September 2016 - May 2017

Advisor: Dr. Erik F.Y. Hom

- Provided technical support by setting up, calibrating and troubleshooting temperature, motion and light sensors in the culture incubation room
- Executed various molecular level processes like polymerase chain reaction and DNA sequencing reaction to amplify small segments of DNA to aid in the study of synthetic algal-fungal mutualism
- Monitored various cultures for growth and maintenance, especially kefir grains and algae

UNDERGRADUATE HONORS THESIS

Translation of Real Human Face to Pointillism using CycleGAN

Advisor: Dr. Yixin Chen

- Created a CycleGAN architecture from scratch i.e create the generator and discriminator networks, write loss functions and write custom training loop for CycleGAN architecture
- Trained the neural networks on the human facial data set and pointillism image data set
- Fine-tuned the neural networks and obtain a reasonable mapping from real human faces to a pointillism format.

Sizing and Economics of Solar Powered Indoor Swimming Pool

Advisor: Dr. Tejas Pandya

- Analyzed thermal energy requirement of the swimming pool located at the Turner Center at The University of Mississippi
- Sized the solar thermal collector system, in an attempt to create a self sustaining energy system
- Performed an economic study of the system

COMMUNITY ENGAGEMENT

Community Assistant

Department of Student Housing

August 2017 - January 2019

The University of Mississippi

- Facilitated the academic, social and personal adjustment of students to the residence hall and university
- Acted as a liaison between residents and the university administration
- Enforced the rules and policies of Residence Life and Student Housing

Community Desk Assistant

Department of Student Housing

August 2016 - July 2017

The University of Mississippi

- Represented the Department of Residential Life in interactions with students, faculty, staff, parents and guests
- Maintained working knowledge of Departmental and University Resources and made referrals as necessary