AMAN BHATTA

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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. 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 — Aug 2021 - Present
PhD in Computer Science and Engineering — GPA : 4.0

The University of Mississippi — Graduated: May 2021
B.S(Hons) in Mechanical Engineering — GPA : 3.96
Minor : Computer Science & Mathematics

TECHNICAL SKILLS

Languages	—	Python, Java, C, C++
Markup	—	HTML, CSS, LaTeX
Databases	—	MySQL, MongoDB, OracleDB
Tools	—	PTC Creo, Git, Mathematica, MATLAB, Adobe Photoshop,COMSOL
Web	—	AWS, WordPress, [Twilio, Google] API
OS	—	Windows, Android, Linux

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. Boult. 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 — August 2021 - Present
Advisor: Dr. Kevin W. Bowyer — *University of Notre Dame*

- **Primary**
  - ✓ Identified the cause of gender gap in face recogntion accuracy. Please refer to this Paper 1
  - ✓ Analyzed the presence of demographic differentials in 1-to-many search. 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. 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/Manufacturing Engineering Co-op January 2019 - May 2020
ThyssenKrupp Elevators Co. *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
  - ✓ 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
  - ✓ 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
- **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

UNDERGRADUATE ACADEMIC RESEARCH EXPERIENCE

Thermal and Fluid Science Lab June 2018 - January 2019
The Univeristy of Mississippi Mechanical Engineering Department *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
- Troubleshot the lab equipment and computer systems

Microbiology Lab September 2016 - May 2017
The University of Mississippi Biology Department *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 TEACHING EXPERIENCE

Undergraduate Teaching Assistant Aug 2020 - Nov 2020
Department of Computer Science *The University of Mississippi*

- Assisted faculty instructor with student academic goals, by working with students individually or in small groups
- Held office hours to aid students to complete lab assignments, to review materials on Python programming, to reinforce materials presented by the faculty instructor, and to answer general questions
- Graded lab assignments and provided clerical support to the faculty instructor

UNDERGRADUATE HONORS THESIS

Translation of Real Human Face to Pointillism using CycleGAN
Advisor: Dr.Yixin Chen

- Create a CycleGAN architecture from scratch i.e create the generator and discriminator networks, write loss functions and write custom training loop for CycleGAN architecture
- Train the neural networks on the human facial data set and pointillism image data set
- Fine-tune 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

AWARDS AND HONORS

ACS Outstanding General Chemistry Student Award	February 2017
Tau Beta Pi Engineering Honors Society	August 2018
Foreign Student and Academic Excellence Award	August 2016
Provost Scholar	August 2016

RELEVANT MOOC CERTIFICATIONS

Coursera

Mathematics for Machine Learning	*Certificate*
Generative Adverserial Network(GANs) Specialization	*In Progress*
Deep Learning Specialization	*In Progress*

edX

C Programming	*Certificate*

Udemy

Python for Computer Vision	*Certificate*
Complete Java BootCamp	*Certificate*
Complete SQL BootCamp	*Certificate*

COMMUNITY ENGAGEMENT

Community Assistant August 2017 - January 2019
Department of Student Housing *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 August 2016 - July 2017
Department of Student Housing *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
- Provided a friendly customer service to residents and parents

EXTRACURRICULAR ACTIVITIES

Entrepreneurship Club August 2017- July 2018
Vice President

- Planned and organized bi-weekly leadership sessions, led by local entrepreneurs, to relay their experience to students
- Provided timely information for newsletters and mailings
- Cooperated with Associated Student Body(ASB) to plan and organize coordinated events

Engineers Without Borders August 2017 - Present
Member

UM Badminton Club August 2017 - Present
Member

Ole Miss Society of Automotive Engineers August 2017 - January 2019
Member