

Ayush Gupta

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Google Scholar

CURRENT RESEARCH INTEREST

Computer Vision, Domain Adaptation, Scene Understanding, Occlusion Aware Perception, Person Re-ID

EDUCATION

Johns Hopkins University <i>Ph.D. in Computer Science (Advisor: Prof. Rama Chellappa)</i>	USA Aug. 2022 – current
Johns Hopkins University <i>M.S.E in Computer Science (GPA: 4.0/4.0)</i>	USA 2022 – 2024
Birla Institute of Technology and Science, Pilani <i>B.E. in Computer Science (GPA: 9.58/10)</i>	India 2018 – 2022

EXPERIENCE

Teaching Assistantship <i>Machine Perception, JHU. Mentor: Prof. Rama Chellappa</i>	Aug. 2023 – Dec. 2023
Undergraduate thesis <i>CRCV Lab, University of Central Florida, Mentor: Dr. Yogesh S Rawat</i>	May 2021 – June 2022
Summer Research Internship <i>Indian Institute of Remote Sensing, ISRO. Mentor: Dr. Rekha Anandrao</i>	May 2020 – July 2020

PUBLICATIONS

- *Ayush Gupta*, Rama Chellappa “**You Can Run but not Hide: Improving Gait Recognition with Intrinsic Occlusion Type Awareness**” WACV 2024 (Oral)
- *Ayush Gupta*, Rama Chellappa “**MimicGait: A Model-Agnostic Approach for Occluded Gait Recognition using Correlational Knowledge Distillation**” under submission.
- Yuxiang Guo, Anshul Shah, Jiang Liu, *Ayush Gupta*, Cheng Peng, Rama Chellappa “**GaitContour: Efficient Gait Recognition based on a Contour-Pose Representation**” under submission.
- Vuong Nguyen, Samiha Mirza, Abdollah Zakeri, *Ayush Gupta*, Rahma Aloui, Khadija Khaldi, Pranav Mantini, Shishir Shah, Fatima Merchant “**Tackling Domain Shifts in Person Re-Identification: A Survey and Analysis**” under submission.
- Basudha Pal, *Ayush Gupta*, Vishal Patel “**EchoSAM: Predicting Ejection Fraction using Segmentation Guided Vision Transformers**” under submission.
- *Ayush Gupta*, Alexander Matasa, Shruti Vyas, Yogesh S Rawat “**GaitZero: Temporal Self-similarity for Unsupervised Gait Recognition**” under submission.
- *Ayush Gupta**, Ashrya Agrawal*, Poonam Goyal, Navneet Goyal “**Visually Guided Knowledge selection for Video Captioning**” under submission.

PROJECTS

Biometrics Recognition and Identification at Altitude and Range	IARPA BRIAR program
<ul style="list-style-type: none">• Implemented a multi-view gait recognition framework on turbulent data captured from upto 1000m• Improved gait recognition under occlusion scenarios• Fusing this approach with other modalities like face and body to identify subject.	

Undergraduate Thesis: Vision Based Gait Recognition CRCV Lab, University of Central Florida

- Developed approaches for unsupervised gait recognition using RGB datasets like FVG and CASIA-B
- Utilized self-similarity matrices for capturing gait patterns using Transformers
- Implemented unsupervised contrastive learning losses to train the model

Natural language Video Description Generation ADAPT Lab, BITS Pilani

- Designed a framework for generating natural language descriptions of videos of real scenes
- Utilized external object detectors to extract generalized nouns for the caption
- Used external knowledge bases to supplement the captioning model with specialized versions of the nouns.

CLARIN COVID-19 Disinformation Hackathon

LT Group, Universität Hamburg

- Developed models for automatic fact-checking
- Used news crawling APIs and existing datasets like EUvsDisinfo and LIAR Plus to verify a claim.

Landcover Classification using Satellite Imaging

IIRS, ISRO

- Used Google Earth Engine to classify satellite image pixels into landcover categories
- Implemented the Spectral Angle Mapper, SVMs and K-Means learning algorithms

Transfer Learning in Semantic Segmentation for Autonomous Vehicles Course Project, Computer Vision

- Collected a dataset, JHUSStreet, of street images from a car and pedestrian perspective around Baltimore.
- Trained and evaluated the DeepLabV3 model on the segmentation task on JHUSStreet dataset.

Adversarial Attacks and Defences on GANs

Course Project, Machine Perception

- Implemented FGSM, Noise and Carlini Wagner attacks on CNNs
- Implemented Adversarial training to defend against these attacks.

AWARDS AND HONORS

- Merit Scholarship for being in **top 2% of students at BITS Pilani** consistently since Aug. 2018
- Recipient of **DAAD-WISE 2021 scholarship** for a summer project in Germany
- State Rank 1 in National Science and Talent Search Examination (NSTSE) 2017

TECHNICAL SKILLS

Languages: Python, C, Matlab, Java.

Frameworks: PyTorch, Tensorflow, Keras.

RELEVANT COURSEWORKS

Computer Vision, Artificial Intelligence, Machine Perception, Machine Intelligence, Neural Networks and Fuzzy Logic, Digital Image Processing, Data Structures and Algorithms, Computer Programming, Probability and Statistics, Multi-Variable Calculus, Linear Algebra and Complex Analysis, Differential Equations, Database Systems, Object Oriented Programming

VOLUNTEERING

Project Lead: Participatory Community Development, Nirmaan Organization

May 2019 - Dec. 2019

- Led a team of 10+ members for scouting infrastructural deficiencies in villages nearby Pilani
- Worked on building a rainwater harvesting system and a solar light in Baas Village.