Rohit **Gupta**

Citizen of India, Currently present in US on F1 visa status

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Education

2019 - Ongoing	**PhD. in Computer Science,** University of Central Florida, Orlando
2015 - 2017	**M.Tech. in Computer Science and Engineering,** IIT Kanpur, Kanpur, India
2010 - 2014	**B.Tech. in Electrical Engineering,** IIT Kanpur, Kanpur, India

Selected Publications

Complete List: `https://scholar.google.co.in/citations?user=0WukQpMAAAAJ&hl=en`

Under Review
Class Prototypes based Contrastive Learning for Classifying Multi-Label and Fine-Grained Educational Videos
R Gupta, A Roy, S Kim, C Christensen, T Grindal, S Gerard, M Cincebeaux, A Divakaran, M Shah
(Private Pre-Print: `https://drive.google.com/file/d/1sIa27ueYGU6DRvHOApkCMcMMdpXXDMkG/`)

Under Review
Query Efficient Cross-Dataset Transferable Black-Box Attacks on Action Recognition
R Gupta, N Akhtar, G Nayak, A Mian, M Shah
Link to Pre-Print: `https://arxiv.org/abs/2211.13171`

Accepted at AAAI 2023
Contrastive Self-Supervised Learning Leads to Higher Adversarial Susceptibility
R Gupta, N Akhtar, A Mian, M Shah
Link to Pre-Print: `https://arxiv.org/abs/2207.10862`

ICPR 2020
Citations: **44**
RescueNet: Joint building segmentation and damage assessment from satellite imagery
R Gupta, M Shah
Link: `https://ieeexplore.ieee.org/document/9412295`

MediaEval 2018
Citations: **13**
Linear Models for Video Memorability Prediction Using Visual and Semantic Features
R Gupta, K Motwani
Link: `http://ceur-ws.org/Vol-2283/MediaEval_18_paper_31.pdf`

CVIU, Jun '22
Citations: **67**
TCLR: Temporal Contrastive Learning for Video Representation
I Dave, **R Gupta**, M N Rizve, M Shah
Link: `https://www.sciencedirect.com/science/article/pii/S1077314222000376`

IEEE Access, Jul '21
Citations: **12**
Cassandra: Detecting Trojaned Networks from Adversarial Perturbations
X Zhang, **R Gupta**, A Mian, N Rahnavard, M Shah
Link: `https://ieeexplore.ieee.org/document/9502110`

Work Experience

SRI International — *Menlo Park (remote)*
Research Intern — *May- August 2022*
- Introduced the novel computer vision task of fine-grained educational video content understanding.
- Developed multi-label, multi-modal prototype contrastive learning to achieve state-of-the-art results.

Conduent Labs (erstwhile Xerox Research Center India) — *Bangalore, India*
Research Engineer, Computer Vision — *Sep. 2017 - Jul. 2019*
- Contributed to a variety of projects in Computer Vision: Analyzing multi-modal data for smart-city applications, Instance recognition and image classification for augmented reality (AR) and appearance based re-identification of cars for traffic flow analysis.
- Placed at the top of the leaderboard of the MediaEval 2018 media memorability prediction challenge.

Fuzzy Logix — *Bangalore, India*
Data Scientist — *Jul. 2014 - Jun. 2015*
- As a developer for DB Lytix™ v1.3 was responsible for contributing to the development of a suite of machine learning, statistical and financial algorithms embedded directly into massive parallel processing data warehouses like Teradata™, Netezza™, etc.
- Developed an open-source R frontend for DB Lytix™ Available at: `https://github.com/Fuzzy-Logix/AdapteR/`

Goldman Sachs — *Bangalore, India*
Summer Analyst, Market Risk Modeling — *May - July 2013*
- Formulated and implemented a new model to efficiently estimate the market risk (stress tests and Value at Risk) caused due to FX volatility skew for firmwide portfolios of Goldman Sachs, containing million of securites.

Recent Research Projects

Multi-Label Contrastive Learning for Fine-Grained Educational Video Classification
SRI & UCF

Internship and Graduate Research Project *2022*

- Developed multi-label prototype contrastive learning for fine-grained classification of educational videos using video, audio and text
- Achieved state of the art results on a novel dataset of education videos and two prior benchmark datasets (YouTube-8M and COIN)

Adversarial Suspectibility of Self-Supervised Representations
UCF

Graduate Research as Lead Researcher *2021*

- Demonstrated enhanced adversarial vulnerability in contrastive self-supervised trained image and video classification models.
- Provided theoretical arguments and empirical evidence to identify the root cause of the vulnerability, leading to design of a new method for training adversarially robust self-supervised models, outperforming the state of the art by about 5%
- Paper on work done is currently under review (Pre-print: `https://arxiv.org/abs/2207.10862`)

Hard Label Black Box Transferable Video Representation Attack
UCF

Graduate Research as Lead Researcher *2021*

- Designed a novel adversarial attack in a unique black box setting with limited knowledge of the class ontology of the black box model.
- Proposed novel orthogonal attack direction search to improve query efficiency of black box attacks
  Manuscript Link: `https://drive.google.com/file/d/1WX7Wos5-xnvy5MxIBf76C-yHV3YZT0nK`

Temporal Contrastive Learning of Video Representation
UCF

Graduate Research as Collaborator *2021*

- Devised a state of the art self-supervised contrastive learning approach for video action recognition.
- Paper on work done is published at a top journal (CVIU, Impact Factor: **4.89**)
  (Open-Access Manuscript Link: `https://arxiv.org/abs/2101.07974`)

Cassandra: Detecting Trojan Backdoors
UCF

Graduate Research as Collaborator *2020*

- Developed supervised and unsupervised methods to detect Trojan backdoors inserted in classification models.
- Paper on work done was Published at IEEE Access (Impact Factor: **3.37**)
  (Link: `https://ieeexplore.ieee.org/abstract/document/9502110`)

Detecting Building Damage from Satellite Images
UCF

Graduate Research as Lead Researcher *2020*

- Developed a novel architecture for detecting building damage using post and pre disaster imagery.
- Demonstrated strong results including generalization across vastly different regions of the earth and disaster types.
- Work lead to a publication at a top conference (Link: `https://ieeexplore.ieee.org/document/9412295`)

Video Memorability Prediction
Conduent Labs

Work Project *June 2018 - Oct 2018*

- Utilized highly regularized linear models on semantic and visual features to predict video memorability.
- Model achieved the best results in the contest, and was accepted for publication in MediaEval Proceedings.

Achievements

2021	**1st Place and Jury Prize**, VI-Priors Action Recognition Challenge, ICCV
2019	**Fellowship**, ORCGS Doctoral Fellowship, UCF
2018	**1st Place**, MediaEval 2018: Predicting Media Memorability Task
2010	**National Rank 433 (Top 0.1%)**, Joint Entrance Exam, Indian Institutes of Technology

Service

2022-present	**Reviewer**, CVPR, ECCV, AAAI, IEEE Journals: Neural Netw. Learn. Syst., Circuits Syst. Video Technol.	
2020, 2022	**Mentor**, NSF Research Experiences for Undergraduates, UCF-CRCV REU Site	
2015-16	**Teaching Assistant**, Courses: Fundamentals of Computing, Machine Learning Tools & Techniques	*IIT Kanpur*

References (Contact Details on Request)

Ph.D. Advisor	**Dr Mubarak Shah** Director, Center for Research in Computer Vision and Trustee Chair Professor, UCF
Internship Mentor & Collaborator	**Dr Anirban Roy** Senior Scientist, SRI International
Collaborator	**Dr Ajmal Mian** Professor, Computer Science and Software Engineering, University of Western Australia