Aman Shrivastava

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website | github | linkedin

EDUCATION

Ph.D. Computer Science, University of Virginia 2020 – 2024
Advisors - Dr. Tom Fletcher and previously - Dr. Vicente Ordonez Roman

M.S. Data Science, University of Virginia 2018 – 2019

B.Tech. Mechanical Engineering, Indian Institute of Technology, Roorkee 2013 – 2017

EXPERIENCE

Machine Learning Scientist, Reddit, CA Feb 2026 – present
- Working on pushing ads conversion models to SOTA

Research Scientist, Meta, WA Jan 2025 – Jan 2026
- Worked on bootstrapping generative models for business AI agents
- Optimized ad relevance ranking to improve CTR by 25%

Research Scientist Intern, Adobe Research, CA May – Nov, 2023
Advisor - Dr. Kushal Kafle
- Trained, and bootstrapped foundation large language and vision models for visual reasoning

Research Scientist Intern, Salesforce Research, CA May – Nov, 2022
Advisors - Dr. Stefano Ermon, Dr. Nikhil Naik
- Worked on conditional generative diffusion models for image synthesis using diverse modalities

Research Scientist, University of Virginia, VA 2019 – 2020
Advisors - Dr. Sana Syed, Dr. Donald E. Brown
- Built machine learning frameworks for the understanding and diagnosis of gastrointestinal diseases

Analyst, Citi, India 2017 – 2018
- Built a streamlined visualization platform with data driven insights for the Chief Country Officer

RESEARCH AREAS

Information-efficient multi-media retrieval and ranking
- Designed frameworks to learn multi-modal representations for relevance ranking and retrieval using paired and unpaired data

Adapting foundation models for visual reasoning
- Worked on training, bootstrapping, and finetuning LLMs with foundation vision models to design visual reasoning systems that can handle both visual and textual prompts

Conditional diffusion models for generative modeling [code] [paper]
- Worked frameworks for conditional image synthesis using denoising diffusion models conditioned on diverse data modalities
- Synthesizing histology images using conditional diffusion models for generating disease micro-environments along with their pixel-wise nuclei segmentation annotations

Information efficiency in contrastive multi-modal representation learning, [code] [paper]
- Designed frameworks to use information efficient lower-bounds on mutual information to learn multi-modal representations from paired image-text data with just one negative sample

Detection and Visual Understanding of Gastrointestinal Diseases, [code] [paper]
- A deep learning framework to classify Celiac and Environmental Enteropathy diseases using high resolution whole slide images from duodenal biopsy slides and numerical biomarkers

PROJECTS

Krity [website]
- Co-founder of an open audiobook platform that allows listeners to find audiobooks in diverse voices, and narrators to give voices to their favorite books. Have produced and published over 40 audiobooks

Connect 4 AI [code] [demo]
- An AI agent based on Minimax algorithm and Monte Carlo simulations for the game of connect 4. Featured on Hacker News. Released a Google Play Store App based on the project – Rated : 4.7

Humorous Image Captioning System [code]
- A self-attentive encoder-decoder framework to generate humorous captions for images indistinguishable from human generated memes

PUBLICATIONS AND PRE-PRINTS

[1] **Diffusion Models for Histopathological Image Generation**, [link]
Aman Shrivastava, P. Thomas Fletcher.
Generative Machine Learning Models in Medical Image Computing
Springer Nature Switzerland 2024 | *Book Chapter*

[2] **NASDM: Nuclei-Aware Semantic Histopathology Image Generation Using Diffusion Models**, [paper]
Aman Shrivastava, P. Thomas Fletcher.
International Conference on Medical Image Computing and Computer Assisted Intervention
MICCAI 2023 | *Oral presentation*

[3] **CLIP-Lite: Information Efficient Visual Representation Learning from Textual Annotations**, [paper]
Aman Shrivastava, Ramprasaath R. Selvaraju, Nikhil Naik, Vicente Ordonez.
International Conference on Artificial Intelligence and Statistics. PMLR
AISTATS 2023 | *Oral presentation*

[4] **Learning Group Actions on Latent Representations**, [paper]
Yinzhu Jin, Aman Shrivastava, Tom Fletcher.
Neural Information Processing Systems 2024

[5] **Estimating and Maximizing Mutual Information for Knowledge Distillation**, [paper]
Aman Shrivastava, Yanjun Qi, Vicente Ordonez.
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition
CVPR 2023

[6] **Identifying metabolic shifts in Crohn's disease using'omics-driven contextualized computational metabolic network models**, [paper]
Philip Fernandes, Yash Sharma, Fatima Zulqarnain, Brooklyn McGrew, Aman Shrivastava, Lubaina Ehsan, Dawson Payne, Lillian Dillard, Deborah Powers, Isabelle Aldridge, Jason Matthews, Subra Kugathasan, Facundo M FernÃąndez, David Gaul, Jason A Papin, Sana Syed.
Scientific Reports 2023.

[7] **Self-Attentive Adversarial Stain Normalization**, [paper]
Aman Shrivastava, Will Adorno, Lubaina Ehsan, S. Asad Ali, Sean R. Moore, Beatrice Amadi, Paul Kelly, Sana Syed, Donald Brown.
International Workshop on Artificial Intelligence for Digital Pathology, 25th International Conference on Pattern Recognition
ICPR 2021 | *Oral presentation*

[8] **Deep Learning for Visual Recognition of Enteropathy and Celiac Disease**, [paper]
Aman Shrivastava, Karan Kant, Saurav Sengupta, Sung-Jun Kang, Marium Naveed Khan, S. Asad Ali, Sean R. Moore, Beatrice Amadi, Paul Kelly, Donald Brown, Sana Syed.

IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI)

[9] **Cluster-to-Conquer: A Framework for End-to-End Multi-Instance Learning for Whole Slide Image Classification.**, [paper]
Yash Sharma, Aman Shrivastava, Lubaina Ehsan, Christopher A. Moskaluk, Sana Syed, and Donald E. Brown.
Medical Imaging with Deep Learning, PMLR
MIDL 2021 | Oral presentation

[10] **Improving interpretability via explicit word interaction graph layer**, [paper]
Arshdeep Sekhon, Hanjie Chen, Aman Shrivastava, Zhe Wang, Yangfeng Ji, and Yanjun Qi.
In Proceedings of the AAAI Conference on Artificial Intelligence
AAAI 2023

[11] **Artificial Intelligence Applied to Gastrointestinal Diagnostics: A Review**, [paper]
Vatsal Patel, Marium N. Khan, Aman Shrivastava, Kamran Sadiq, S. Asad Ali, Sean R. Moore, Donald E. Brown, Sana Syed.
Journal of Pediatric Gastroenterology and Nutrition, 2019

[12] **Solving the Stain Dilemma: Computational Image Analyses to Address Differential Tissue Staining Color Bias in Duodenal Biopsies**, [paper]
Sana Syed, Aman Shrivastava, Karan Kant, Luke Kang, Saurav Sengupta, Marium Naveed Khan, Najeeha Talat Iqbal, Kamran Sadiq, Christopher A. Moskaluk, Beatrice Amadi, Paul Kelly, Sean Moore, Donald Brown.
Digestive Disease Week (DDW), May 20th, 2019 | Poster presentation

[13] **Deep Learning for Detecting Diseases in Gastrointestinal Biopsy Images**, [paper]
Aman Shrivastava, Karan Kant, Saurav Sengupta, Sung-Jun Kang, Marium Naveed Khan, S. Asad Ali, Sean R. Moore, Beatrice Amadi, Paul Kelly, Donald Brown, Sana Syed.
Systems and Information Engineering Design Symposium, April 26th, 2019 | Invited talk

Interests and Competences

Interests: Generative Modeling, Multimodal learning, Computer Vision, Healthcare
Languages: Python, R, C++, Ruby, Julia, Javascript, LaTeX
Packages/Tools: PyTorch, Tensorflow, Keras, Git, AWS, GCP, MongoDB, Redis

Teaching Experience / Talks

Co-instructor, Geometry of Data, University of Virginia, [videos] — Fall 2023
Oral Presentation, MICCAI 2023 — Fall 2023
Invited Speaker, Research Speaker Series, PathAI — Summer 2023
Teaching Assistant, Digital Signal Processing | Prof. Tom Fletcher, University of Virginia — Spring 2023
Teaching Assistant, Geometry of Data | Prof. Tom Fletcher, University of Virginia — Fall 2022
Teaching Assistant, Machine Learning | Prof. Yanjun Qi, University of Virginia — Spring 2022
Python Instructor, SOAR Scholars Program, University of Virginia — Spring 2021
Python Instructor, Health Sciences Library, University of Virginia — Spring 2020
Assistant Capstone Advisor, School of Data Science, University of Virginia — Fall 2019
Invited Speaker, Applied Machine Learning Conference, Tom Tom Festival — Fall 2018

Extra-curriculars

Chess: Represented UVA at Virginia State Collegiate Chess Championship 2023.
Editor-in-Chief: Geek Gazette, campus technical magazine, IIT Roorkee.
Coding Society: Information Management Group, an exclusive campus coding society, IIT Roorkee.
Quizzing Society Core-memeber of the IIT-R quizzing society, organised 20+ quizzes across campuses.