SRISHTI YADAV

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I am a 2nd year ELLIS PhD fellow at University of Copenhagen and University of Amsterdam where I am working on multi-modal research problems related to a) cross-cultural understanding and b) fine-grained narratives. I am a graduate from Simon Fraser University, Canada with 3.5 years of industry experience. I have experience in implementing machine learning algorithms at scale.

SKILLSET	**Languages and Tools**: PyTorch, Numpy, Scipy, OpenCV, Matplotlib, AWS cloud services like S3, EC2 and Amazon Sagemaker as well as Azure services like Data warehouse, AML and Azure functions.

EDUCATION

ELLIS Ph.D. Fellow ($\sim 5\%$ acceptance rate)   2023-present
Advisor: Dr. Serge Belongie & Dr. Ekaterina Shutova
- Pioneer Centre for AI, Department of Computer Science, University of Copenhagen
- Institute for Logic, Language and Computation, University of Amsterdam (ELLIS co-host)

MS, Research-Track (Full Scholarship)   2018-2020
Advisor: Dr. Shahram Payandeh
Simon Fraser University, Canada

Bachelor of Technology, Electronics and Communication
Uttar Pradesh Technical University, India   2012-2016

PROJECTS

Revealing Fine-Grained Values and Opinions in LLMs : Paper :
EMNLP 2024

1. Does large-scale study on revealing fine-grained values & opinions in LLMs with naturalistic evaluation of their responses to the Political Compass Test (PCT).

2. Generated a dataset of 156,240 responses to the 62 PCT questions from 6 LLMs using 420 prompt variations across different demographic categories.

3. Proposes a novel methodology combining coarse-grained stance analysis with fine-grained analysis of textual justifications through tropes.

Classification of Unsupported Claims using LLMs : Paper :

1. Curated a unique dataset comprising over 120,000 tweets annotated for narrative prediction across controversial topics, for detailed analysis of unsupported claims in social debates.

2. Implemented a novel method using LLMs such as T0, to predict and generate narratives from tweets, improving narrative classification accuracy.

3. Applied fine-tuning techniques like few-shot learning and LoRA to improve LLM performance on narrative prediction tasks.

4. Detailed performance evaluation reported using metrics like BLEU, METEOR, and BERT-score. Also assessed human judgment through crowd-sourced evaluations.

RGB-Depth Based Occlusion Aware Target Re-detection Video Paper 1 Paper 2 :

1. Implemented deep attention model and a target re-detection long term tracker using Kinect RGB-D camera.

2. Tracker could infer& track target with information provided only in first frame.

3. Adaptive appearance model could accurately detect color camouflage, even in the presence of complex natural objects.

4. Improved the accuracy by approximately 50% and reduced the type I error by 23% and type II error by 5%.

Celestini Project India:
1. Developed a prototype video analytic algorithm to infer position, lane and density of vehicles in front of the camera.

2. Additionally worked on optimizing code to on Raspberry Pi 3 Model B which required porting code to Octave.

Prototype Landslide Risk Communication System Paper :
- Developed a system which forecasts and communicates occurrence of landslides.
- Conducted field survey and implemented a system for sensor deployment (sensors, microcontroller boards, GSM module and other electical components).

EXPERIENCE

Machine Learning Engineer   September 2021-November 2022
Cubic Farms, Canada
Designed and build an end-to-end unit for plant scientists to replace their manual image analytics process.

1. **Server Automation:** Developed a server solution that automated the capture of plant images and weights, increasing data collection speed by 2x through integration with Azure Blob.

2. **Data Streamlining:** Designed and deployed a web application that streamlined the plant metadata collection process for teams in Alberta and British Columbia, enhancing productivity and enabling real-time report generation on PowerBI dashboards.

3. **Customer Support:** Provided ongoing software support to teams across two regions, maintaining high system reliability and user satisfaction.

4. **ML Deployment:** Constructed a machine learning pipeline for predicting lettuce size, featuring image calibration, preprocessing, and object detection. Deployed the solution on Azure Functions, achieving a 95% accuracy in size estimation.

5. **Health Assessment:** Engineered an in-camera image processing pipeline using MAPIR cameras, successfully calculating the Normalized Difference Vegetation Index (NDVI) for accurate plant health assessment from RGN images.

Machine Learning Consultant   July 2021-August 2021
Coastal Resource Mapping, Canada
1. **Vegetation Analysis:** Computed and analyzed vegetation index for plant health from aerial raster data.

2. **Data Pipeline Development:** Worked on a data pipeline leveraging Deep Convolutional Neural Network (CNN) to segment individual plants in orthomosaic raster imagery.

3. **Plant Detection:** Worked on plant detection for high-value crops that need to be monitored at the resolution of individual plants.

Machine Learning Associate   October 2020-September 2021
MILA, Montreal, Canada
1. **Project Foundation and Strategy:** As one of the first hires for the project, played a pivotal role in drafting the initial framework. Defined the project scope and objectives by analyzing relevant research papers, defining methodology, and was instrumental in identifying and procuring suitable datasets for analysis.

2. **Species Data Analysis:** Analyzed species observation data from eBird, filtering and processing over 20 years of records from 8439 hotspots across the continental USA. Excluded non-indicative data, employing geographic range corrections to enhance data reliability.

3. **Advanced Machine Learning Deployment:** Provided technical support to research team in building their dataloader, and models (supervised and transfer learning tasks) for analyzing temporal and multispectral satellite imagery.

Machine Learning Intern   February 2020-August 2020
UrtheCast, Vancouver, Canada

1. **Machine Learning Implementation:** Individually implemented machine learning system for satellite data (Landsat8, SPARCS, Sentinel 2 dataset) for multi-class prediction of cloud, shadow, and haze.

2. **Data Ingestion Pipeline:** Implemented a data ingestion pipeline which takes in raw geospatial multi-dimensional data as input and converts it into a standardized format.

3. **Cloud-Based Scaling:** Scaled the algorithm using AWS cloud-based services, such as EC2 for deployment server, S3 for data storage, and Docker for creating a virtual environment and parallel deployment of multiple training jobs.

4. **Optimization Techniques:** Investigated and implemented optimization methods to improve cloud mask generation from S2 data using the Green, Red Edge, and Water Vapor band.

Graduate Research Assistant   2018-2020
Networked Robotics and Sensing Laboratory
School of Applied Science, Simon Fraser University, Canada

Project Associate   July 2017-October 2017
Helicopter and VTOL Laboratory
Indian Institute of Technology Kanpur, India

Computer Vision Developer, Celestini Project   June 2016-July 2017
Samsung IoT Innovation Lab, Delhi, India

Intern (Undergrad)   Between 2015 - 2016
Omnipresent Robot Technologies and ACS Lab, IIT Mandi

PUBLICATIONS   Wright, D., Arora, A., Borenstein, N., **Yadav, S.**, Belongie, S., & Augenstein, I. Revealing Fine-Grained Values and Opinions in Large Language Models. In Findings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP)

Christensen, P. E., **Yadav, S.** , & Belongie, S. (2023). Prompt, Condition, and Generate: Classification of Unsupported Claims with In-Context Learning. arXiv preprint arXiv:2309.10359.

Yadav, S., & Payandeh, S. (2023). DATaR: depth augmented target redetection using kernelized correlation filter. Multimedia Systems, 29(1), 401-420.

Yadav, S. (2021). Occlusion Aware Kernel Correlation Filter Tracker using RGB-D. arXiv preprint arXiv:2105.12161.

Yadav, S., & Payandeh, S. (2021). Critical Overview of Visual Tracking with Kernel Correlation Filter. Technologies, 9(4), 93.

Rasoulidanesh, M., **Yadav, S.**, Herath, S., Vaghei, Y., & Payandeh, S. (2019). Deep

Attention Models for Human Tracking Using RGBD. Sensors, 19, 750. (Poster at WiML Workshop, NeurIPS 2019)

Yadav, S., & Payandeh, S. (2018, November). Understanding tracking methodology of kernelized correlation filter. In 2018 IEEE 9th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON) (pp. 1330-1336). IEEE.

Chaturvedi, P., Thakur, K., Mali, N., Kala, V. U.,Kumar, **S., Yadav**, S. & Dutt, V. (2017). A Low-Cost IoT Framework for Landslide Prediction and Risk Communication. In CRC Press: Internet of Things Concepts, Technologies, Applications, and Implementations (2017)

OUTREACH	- Women in Computer Vision (WiCV) (2023-present)	Board Member
	- Women in Computer Vision (WiCV) @ICCV 2023, @CVPR 2021	Advisor
	- Vancouver Datajam (2020-2022)	Founding Member
	- Women in Computer Vision (WiCV) @CVPR 2020	Organizer
	- Women in Machine Learning @NeurIPS 2019 (Vancouver,Canada)	Organizer
	- Invent the Future, AI4ALL@SFU (Vancouver, Canada)	Mentor(Robotics)