

Sourav Pal

CS PhD Student at University of Wisconsin-Madison

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Education

University of Wisconsin-Madison

Aug 2019 - Present

PhD in Computer Sciences

Minor in Mathematics

Advisor: Prof. Vikas Singh

Indian Institute of Technology Kharagpur, India

Jul 2014 - May 2018

B.Tech. (Hons.) in Computer Science and Engineering

CGPA: 9.33/10.0

Research Interests

Machine Learning, Deep Learning, Computer Vision.

Papers

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- **Sourav Pal**, Harshavardhan Adepu, Clinton Wang, Polina Golland, Vikas Singh, “Implicit Representations via Operator Learning” (ICML 2024, [Paper Link](#))
 - Jurijs Nazarovs, Zhichun Huang, Xingjian Zhen, **Sourav Pal**, Rudrasis Chakraborty, Vikas Singh, “Variational Sampling of Temporal Trajectories” (arXiv 24, [Paper Link](#))
 - **Sourav Pal**, Zhanpeng Zeng, Sathya N. Ravi, Vikas Singh, “Controlled Differential Equations on Long Sequences via Non-standard Wavelets” (ICML 2023, [Paper Link](#))
 - Zhanpeng Zeng, **Sourav Pal**, Jeffery Kline, Glenn Fung, Vikas Singh, “Multi Resolution Analysis (MRA) for Approximate Self-Attention” (ICML 2022, [Paper Link](#))
 - Ronak Mehta*, **Sourav Pal***, Vikas Singh, Sathya N. Ravi “Deep Unlearning via Randomized Conditionally Independent Hessians” (CVPR 2022, [Paper Link](#))
 - Gupta Prakhar, **Sourav Pal***, Shubh Gupta*, Ajaykrishnan Jayagopal*, and Ritwik Sinha. “Saliency Prediction for Mobile User Interfaces.” (WACV 2018, [Paper Link](#))
 - **Sourav Pal***, Tharun Mohandoss*, Pabitra Mitra. “Visual Attention for Behavioral Cloning in Autonomous Driving.” (ICMV 2018, [Paper Link](#))
 - Ankan Mullick, **Sourav Pal**, Projjal Chanda, Arijit Panigrahy, Anurag Bharadwaj and Siddhant Singh. “D-FJ: Deep Neural Network Based Factuality Judgment” (SIGKDD-W 2019 [Paper Link](#))

* *Authors contributed equally.*

Patents

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- Ritwik Sinha, Sourav Pal, Prakhar Gupta, Shubh Gupta and Ajaykrishnan Jayagopal. “Saliency Prediction for a Mobile User Interface.” [US Patent 10,664,999](#) (Granted)
 - Ritwik Sinha, Sourav Pal, Prakhar Gupta, Shubh Gupta and Ajaykrishnan Jayagopal. “Saliency Prediction for Informational Documents.” [US Patent 11,263,470](#) (Granted)

Internships

Microsoft Research, Redmond

Jun’22 - Aug’22

Research Intern

Advisor: Dr. Vibhav Vineet, Dr. Neel Joshi

- Worked on synthetic data generation for training large models on computer vision tasks like object detection and segmentation.
- Automate a simple cut-paste strategy of placing varied objects on varying background involving bilevel optimization of the end task and placement strategy.

Adobe

May’21 - Aug’21

Data Science Intern

- Worked on controlled text summarization task.
- Proposed a novel pipeline for the task leveraging on the recent state of the art techniques for the problem.
- Implemented the end to end pipeline.
- Improved already existing methods to improve performance in the task of controlled text generation.

Adobe Research, BigData Experience Lab

May’17 - Jul’17

Research Intern

Advisor: Dr. Ritwik Sinha

- Worked on analysis and improvement of mobile user interfaces using eye gaze tracking.
- Used computer vision techniques to develop deep learning models to predict visual saliency of mobile interfaces.
- Developed metrics for evaluating saliency on a new kind of data set, which was collected by deploying an application in Amazon Mechanical Turk.

Presented the work as a talk at the Adobe Tech Summit 2019 (Feb'3-7), San Francisco.

National Digital Library of India, MHRD Government of India.

May'16 - Jul'16

Summer Intern

Advisor: Prof. Partha Pratim Das, IIT Kharagpur

- Used dynamic instrumentation for debugging and analysis of multithreaded applications.
- Developed algorithms to create tools for data-race detection, deadlock detection, thread-model detection.
- Integrated the above tools with the popular IDE Eclipse as Plug-ins and with Code-blocks as user-defined tools.

Work Experience

Adobe Inc.

Jul'18 - Jul'19

Member of Technical Staff, Document Cloud - Adobe Acrobat

- Worked on prototyping a new feature for the Adobe Acrobat Reader. This feature enabled providing intelligent insights around conversations using machine learning.

The prototype was declared as the winner of the Adobe Document Cloud HackWeek in Noida.

- Worked on voice first documents for Acrobat Reader and integrated the application with Amazon Alexa.

Research Projects

Bachelor's Thesis, Indian Institute of Technology Kharagpur

Jul'17 - May'18

Advisor: Prof. Pabitra Mitra

The goal of the work was to use **Visual Attention** to enhance performance of **Autonomous Vehicles**. The first method proposed a supervised learning approach in which we collected eye-gaze data for the task of driving and used this to train a model for predicting the attention map. The second method described an unsupervised approach where we trained a model to learn to predict attention as it learns to drive a car. The results were conclusive of the fact that incorporation of visual saliency in the autonomous driving agent is capable of improving performance.

Work was published at 11th International Conference on Machine Vision (ICMV 2018)

The project was selected by the Department of Computer Science & Engineering, IIT Kharagpur for Patent Filing

Deep Learning in opinion detection, Natural Language Processing Term Project

Aug'17-Nov'17

Advisor: Prof. Niloy Ganguly and Mr. Ankan Mullick

Used deep learning techniques to develop models to detect and categorize diverse opinionated sentences from within online news articles, both in general and event specific datasets. Implemented LSTM and CNN based models; used GloVe embedding word vectors and dependency based word embedding for training on MPQA and Yahoo datasets. Also, studied how the sentiment varies according to the opinion fraction in an article.

Work was published at Truth Discovery and Fact Checking: Theory and practice workshop, ACM SIGKDD 2019

Other academic projects, are present in my [Github account](#).

Technical Skills

Programming Languages:

- **Proficient:** Python, Matlab, C++
- **Intermediate:** HTML, Bash, Verilog(HDL), Julia

Tools & Frameworks: PyTorch, Jax, Keras, Numpy, Scikit-learn, OpenCV, Weka, NLTK, L^AT_EX

Relevant Coursework

Mathematical Foundation of Machine Learning	Methods of Applied Mathematics	Real Analysis
Learning Based Computer Vision	Matrix/Linear Algebra	Complex Analysis
Advanced Machine Learning	Probability & Statistics	Measure Theory
Natural Language Processing	Non-Linear Optimization	
Methods of Computational Mathematics	Partial Differential Equations	

Teaching Experience

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- Head Teaching Assistant for Data Programming 1 (CS220) Fall 2020 at UW-Madison
 - Teaching Assistant for Data Programming 1 (CS220/301) Spring 2020/Fall 2019 at UW-Madison

Reviewing

ICML 24, NeurIPS 23, ICML 22, CVPR 22, WACV 22

Academic Achievements

- Secured an **All India Rank(AIR) of 411 in JEE Main 2014** out of 1.5 million candidates.
- Secured a rank of **51 in WBJEEM 2014** out of 1,00,000 candidates.

Positions of Responsibility

- Served as mentor to undergraduate students at **UW-Madison** as part of the [WISCERS](#) program
- Served as **School Captain** of The Assembly of God Church School, Purulia. Successfully conducted all student activities during the academic year.
- Served as mentor to a group of six first year undergraduate students for a period of two years from 2016-2018 at **IIT Kharagpur**.
- Active member of **National Service Scheme(NSS)**. Awarded **Certificate of Recognition** for two years of extraordinary social service.