OJASV KAMAL

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EDUCATION

Indian Institute of Technology Kharagpur — Kharagpur, India
B.Tech M.Tech Dual Degree, Mechanical Engineering; CGPA: 8.85/10 — *2018 – Present*

Sukriti World School — New Delhi, India
All India Senior School Certificate Examination (AISSCE); Percentage: 92.8/100 — *2017 - 2018*

Scholars Rosary Senior Secondary School — Rohtak, India
All India Secondary School Examination (AISSE); CGPA: 10/10 — *2015 - 2016*

PUBLICATIONS

- **When to Make Exceptions: Exploring Language Models as Accounts of Human Moral Judgment**
  Zhijing Jin, Sydney Levine, Fernando Gonzalez, **Ojasv Kamal**, Maarten Sap, Mrinmaya Sachan, Rada Mihalcea, Josh Tenenbaum, Bernhard Schölkopf.
  In Proceedings of the Advances in Neural Information Processing Systems 35 (NeurIPS 2022)
  Available at https://arxiv.org/abs/2210.01478
- **Adversities are all you need: Classification of self-reported breast cancer posts on Twitter using Adversarial Fine-tuning**
  Adarsh Kumar*, **Ojasv Kamal***, Susmita Mazumdar* (Equal Contribution)
  In Proceedings of the Sixth Social Media Mining for Health (SMM4H) Workshop and Shared Task NAACL 2021. Available at https://aclanthology.org/2021.smm4h-1.22/
- **Hostility Detection in Hindi leveraging Pre-Trained Language Models**
  Ojasv Kamal*, Adarsh Kumar* (equal contribution), Tejas Vaidhya.
  International Workshop on Combating Online Hostile Posts in Regional Languages during Emergency Situation, AAAI 2021. Available at https://link.springer.com/chapter/10.1007/978-3-030-73696-5_20

RESEARCH EXPERIENCE

Causal Relation Extraction from Human Conversations — *Jul 2022 - Present*
ETH Zürich, Language, Reasoning and Education Lab , with Prof. Mrinmaya Sachan
- Surveyed **30** datasets containing natural language text with labeled cause-effect span pairs.
- Quantified the ability of BERT model to extract cause-effect spans in a supervised setting.
- Compared this performance to zero-shot performance of GPT-3 by tuning over **250** prompts

Analysing Meta-Contrastive Learning for Few-Shot Slot Filling — *Dec 2021 - Present*
NUS, Web Information Retrieval / Natural Language Processing Group, with Prof. Min-Yen Kan
- Interpreted the complex process of **meta-learning** by studying the two levels of base and meta-learning separately
- Quantified the effect of using contrastive learning as the base learning algorithm for few-shot slot filling
- Performed **42** ablation tests on **7** dataset domains to study the effect of removing each domain
- Correlated the performance drop with **19** out-of-domain metrics representing text properties to interpret the role of contrastive learning in meta learning
- Working on completing the post-result analysis to publish in a peer-reviewed conference

Conversational Recommender System Toolkit — *Jul 2022 - Nov 2022*
NUS, Web Information Retrieval / Natural Language Processing Group, with Prof. Min-Yen Kan
- Built a user preference estimation module using factorization machine to understand user preferences
- Added a recommendation module to accomplish recommendations in a short number of turns using reinforcement learning
- Created an end-to-end pipeline to incorporate the possibility of noise and uncertainty in language understanding

When to Make Exceptions: Exploring Language Models as Accounts of Human Moral Judgment
ETH Zürich, Language, Reasoning and Education Lab , with Prof. Mrinmaya Sachan — *Mar 2022 - May 2022*
- Investigated the potential of LLMs like GPT-3 and Delphi to reason in various moral scenarios by analyzing with **50** custom prompts
- Scraped average prices of **220** services from Fiver to estimate these models' understanding of their value
- Research was acclaimed as an oral presentation at Neural Information Processing System **(NeurIPS) 2022**

Causal and Anticausal Prompting *Mar 2022 - Jun 2022*
ETH Zürich, Language, Reasoning and Education Lab , with Prof. Mrinmaya Sachan

- Designed causal and anticausal prompts using customer reviews from the Yelp dataset
- Predicted customer ratings through these prompts using language models like RoBERTa and GPT-2
- Employed **adversarial attack** on the model to establish superior robustness of causal prompts

Improving Automatic Speech Recognition (ASR) on Out-of-Vocabulary words *May 2022 - Jul 2022*
Sprinklr, Machine Learning Team

- Incorporated domain-specific data into the encoder and decoder of Sprinklr's ASR system.
- Improved the decoder by combining the probabilities of the ASR model with a language model built using a domain-specific corpus.
- Supplied the encoder with information from related ASR datasets using **continual learning**.
- Reduced the word error rate by **118%** using the language model and further by **42%** using continual learning.
- Implemented language model pruning to reduce memory utilization by **91%** and latency by **31%**

RESEARCH PROJECTS

Adversities are all you need: Classification of self-reported breast cancer posts on Twitter using Adversarial Fine-tuning

- Classified **5000** tweets as positive/negative cases of self-report of breast cancer.
- Enhanced the robustness towards adversarial examples by introducing a **gradient-based perturbation**.
- Improved the average micro F1 score by **5%** across various pre-trained language models.
- Sixth Social Media Mining for Health (**SMM4H**) Workshop and Shared Task collocated with NAACL 2021

Hostility Detection in Hindi leveraging Pre-Trained Language Models

- Designed an auxiliary model approach to detect hostility occurrence and type of hostility in Hindi tweets
- Improved the micro F1 score by **13%** over the baseline using the above approach
- Paper accepted at the International Workshop on Combating Online Hostile Posts in Regional Languages during Emergency Situation (**CONSTRAINT**), collocated with AAAI 2021

Unsupervised Domain Adaptation
IIT Kharagpur, Swarm Robotics Lab, with Prof. Somesh Kumar

- Identified and studied the problem of covariate shift in the semantic segmentation of robots in the lab
- Imparted domain invariant features from source to the target domain using shared parameters of "Coupled Generative Adversarial Network."
- Optimised the number of parameters in the network by implementing the paper "Unsupervised Domain Adaptation by Backpropagation."

AWARDS & ACHIEVEMENT

- **Joint Entrance Exam Advanced:** Secured an All India Rank of 2135 (top **1** percentile) in the examination
- **Joint Entrance Exam Main:** Bagged an All India Rank of 3621 (top **0.3** percentile) in the examination
- **Kishore Vaigyanik Protsahan Yojana 2018:** Achieved an All India Rank of 1487 (top **3** percentile)
- **Table Tennis:** Accomplished **1**st position in Table Tennis state championship (under-12 category) and managed a peak national rank of **36** in 2011

MENTORSHIPS & VOLUNTEER ACTIVITY

- **Research Team Mentor:** Mentored a group of four junior researchers in the software team at Swarm Robotics lab, IIT Kharagpur. Two of them are leading the team now.
- **Open Source Contribution:** Contributed various differential equation solvers in the form of **3111** lines of code to the OrdinaryDiffEq.jl package of Julia's scientific computing library SciML.
- **Teaching Assistant:** Assisted fourth-year undergraduate students in tutorial problems for the course "Systems and Controls"
- **Social Work Volunteer:** Volunteered in organizing a food donation and a dental checkup camp for Rotary Club, Rohtak.

SKILLS AND COURSEWORK

Languages	English, Hindi, French, Sanskrit
Programming Skills	Python, C/C++, Julia, Javascript, MATLAB
Design Skills	Photoshop, Unity, WordPress, Prezi, Microsoft Suite (Word, Excel, Powerpoint)
Technologies	Pytorch, TensorFlow, Keras
University Level Courses	Natural Language Processing, Probability and Statistics, Calculus, Linear Algebra
MOOCs	Machine Learning, Deep Learning, Reinforcement Learning, Computer Vision, Multitask and Meta Learning