

INTERESTS

Natural Language Processing (NLP), Grounding in Language, Explainability, Natural Language Generation, Dialogue, Multilingual NLP, Deep Learning

EDUCATION

- **Indian Institute of Technology and Science** Kharagpur, India
Bachelor of Technology in Computer Science and Engineering: GPA: 9.66/10.0 July. 2018 – July. 2022 (Expected)
- **Shivashish High School** Ahmedabad, India
Higher Secondary Education in Science: 95.6% May. 2016 – May. 2018

EXPERIENCE

- **Technische Universität Darmstadt** Ubiquitous Knowledge Processing Group
Research Intern — Supervisor(s): Dr Iryna Gurevych, Dr. Gozde Sahin Ongoing
 - **Explainability using additive models:** Developing interpretability techniques based on additive models, for predicting relative contribution of parts of input on overall prediction for various NLP tasks like NLI, QA etc.
 - **Detecting artifacts in datasets:** Using relative contribution of parts of input to identify misleading patterns and artifacts that affect model behaviour.
- **Adobe** Big Data Experience Lab, Bangalore, India
Research Intern — Supervisor(s): Dr. Niyati Chhaya, Suryateja Bulusu May 2021 - Aug 2021
 - **AI for collaboration:** Built an RL agent and user interface for simultaneous collaborative colouring of line-art
 - **Dataset for colouring of line-art:** Scraped more than 250k flat colored images from coloring websites, vectorized images with photoshop scripts and extracted segments and corresponding colors using svg parsers
 - **User Simulator and RL agent:** Built a rule-based user simulator to simulate multiple users simultaneously coloring a line-art and a decision transformer architecture to resolve creative conflicts between artists.
 - **Frontend for live collaboration:** Twilio API for live collaboration, with conflicts being resolved by our agent
- **University of Alberta** *May 2021 - Sep 2021*
Research Intern — Supervisor: Prof. Lili Mou
 - **Explainable NLI:** Developed a weakly-supervised explainable phrase level reasoning system for NLI that uses fuzzy logic formulae to induce sentence level labels from phrase level labels for aligned phrasal chunks. We utilize only sentence label supervision while maintaining end-to-end differentiability
 - **Platform for Phrase Level Annotation:** Created a lightweight flask based website for phrase level annotation to create the test set for our approach. Features included a thesaurus, a progress dashboard and bookmarking
- **Autonomous Ground Vehicle Group** IIT Khargapur, WB
Undergraduate Student Researcher Feb 2019 - Mar 2020
 - **Intelligent Ground Vehicle Challenge:** Path planning and localization in ROS for Eklavya 7.0
 - **Frenet Path Planner:** A C++ implementation of frenet frame algorithm for local path planning
 - **CARLA:** Environment for training RL algorithms using lidar, collision and camera data from CARLA simulator

PUBLICATIONS AND PREPRINTS

- [Understanding the Role of Affect Dimensions in Detecting Emotions from Tweets: A Multi-task Approach](#)
Rajdeep Mukherjee, Atharva Naik*, Sriyash Poddar*, Soham Dasgupta, *SIGIR 2021* (* indicates equal contribution)
- **CollabColor: Creative Support System for Human-Human Synchronous Collaboration**
Suryateja BV, Atharva Naik, Yash Parag Butala, Jeet Patel, Sristy Sharma, Niyati Chhaya (*under review*)
- [Weakly Supervised Explainable Phrasal Reasoning with Neural Fuzzy Logic](#)
Zijun Wu, Atharva Naik, Zi Xuan Zhang, Lili Mou (*under review*)
- [Representation Learning for Conversational Data using Discourse Mutual Information Maximization](#)
Bishal Santra, Sumegh Roychowdhury, Aishik Mondal, Vasu Gurrarn, Atharva Naik, Manish Gupta, Pawan Goyal (*under review*)

PROJECTS

- **Multilingual Dialogue Understanding** Ongoing
BTech Project — Supervisor: Dr. Pawan Goyal
 - **Creation of multilingual dataset:** Scraping twitter to create a multilingual open domain dialogue dataset
 - **Unified framework for multilingual dialogue:** Finetuning existing cross-lingual models on multi-lingual dataset with a generative loss. We also plan to build a single framework capable of handling multilingual dialogue.
- **Quantifying the Effect of Model Capacity on Data Maps** Oct 2021 - Nov 2021
Investigating the effect of number of learnable parameters on the shape of [data maps](#).
 - **Adding support for task adapters:** We added [code](#) to compute training dynamics for models with task adapters. We also investigated the impact of reducing number of learnable parameters, on training dynamics
 - **Evaluation framework for comparing data maps:** We extended the partitioning scheme defined in the original paper and developed metrics, to quantify the shift in the data map of a given dataset for different models.
- **Headline Generation** Mar 7 - Mar 26, 2021
Worked on headline generation for multilingual articles for Inter IIT Technology Meet.
 - **Variational Autoencoders for Diverse Summaries:** We adapted the method proposed by a research paper leveraging variational auto-encoders for discourse level diversity to headline generation.
 - **Monolingual headlines for multi-lingual articles:** Since source articles contained Hindi, English and Hinglish, we used translation and post-processing techniques to ensure that generated headlines were in English.
- **Fine Grained Scheduling for Transformers** Feb 2021 - Apr 2021
Leveraging stream level parallelism and kernel fusion to speed up forward pass of a BERT encoder.
 - **Batch level parallelism:** Parallelized operations on tensors by leveraging CUDA stream API
 - **Improving Deepspeed BERT:** Incorporated aforementioned optimized multi-stream transformer operations into the forward pass of the BERT encoder implementation of Microsoft's Deepspeed framework.
- **Emotion Detection from COVID-19 Tweets** May 2020 - Jul 2020
Analysis of emotion reactions of people to COVID-19 using tweets.
 - **Multi task training:** Used hierarchical multi task training between real valued Valence Arousal Dominance dimension vector and categorical emotion based classifiers to leverage datasets using incompatible models of emotions.
 - **Aspect extraction and trend analysis:** Used unsupervised aspect extraction to understand emotional reactions of people to various topics corresponding to each emotion, to compare the relative importance of the topics
- **Aspect Based Opinion Summarization** Mar 2020 - Apr 2020
Survey of Aspect Based Opinion Summarization methods as group project for NLP course.
 - **Summarizing Tourist Data:** Surveyed latest techniques in the domain of aspect-based opinion summarization. Adapted a multi-Document mean summarization approach for tourist data.
 - **Aspect Extraction on Medical and Tourist data:** Tested unsupervised aspect extraction methods on CORD dataset consisting of COVID-19 related research papers and tourist data.

PROGRAMMING SKILLS

- **Languages:** Python, Javascript, C, C++, Bash, Scala, Verilog
- **Libraries:** PyTorch, Tensorflow, HuggingFace, NLTK, sklearn, pandas, spacy, beautifulsoup, selenium
- **Frameworks:** CUDA, OpenMP, MPI, OpenCV, WandB, PyQt5, Django, Flask, ROS, Git, Latex

ACADEMIC HONOURS AND AWARDS

- **MITACS Globalink Scholarship:** Awarded MITACS scholarship to intern at University of Alberta
- **DAAD WISE Scholarship:** Awarded DAAD-WISE scholarship to intern at TU Darmstadt
- **Inter IIT Technology Meet:** Member of the bronze medal winning contingent for IIT Kharagpur
- **Intelligent Ground Vehicle Competition:** Member of the Eklavya 7.0 team from IIT Kharagpur that placed 2nd in [IGVC](#) 2019. Worked on path planning and localization using Robot Operating System(ROS) framework.
- **Kishore Vaigyanik Protsahan Yojana (KVPY):** Awarded fellowship for achieving all India rank 543.
- **Top 0.1% performance in Chemistry:** Awarded certificate for top 0.1% performance in board exams

RELEVANT COURSEWORK

Natural Language Processing, Deep Learning, Machine Learning, Reinforcement Learning, Artificial Intelligence, Image Processing, Scalable Data Mining, High Performance Parallel Programming, Probability and Statistics, Theory of Computation, Algorithms, Computer Organisation and Architecture, Computer Networks, Compilers, Operating Systems, Software Engineering, Stochastic Processes in Finance

OTHER PROJECTS

• **FigUI**

A suite of commonly used GUI tools built using PyQt5.

- **File viewing and editing:** A basic text editor, a code editor with features like syntax highlighting, search and code folding, using codemirror, pdf viewer using pdf.js, live editor-renderer for html, image viewer and editor, video player with python-vlc, 3D model (.stl) file viewer using python bindings for vtk and a simple file explorer.
- **Commonly used applications:** Embedded terminal, Embedded chromium browser, calculator, analog clock, QR Code generator, task viewer, system dashboard (process/cpu info with psutil)

• **social_media: frontend scraping with selenium**

Front end based scraper for popular social media platforms like instagram, twitter, youtube, quora etc.

- **Automating posting and login:** Built routines to automate login and posting using frontend layout of pages.
- **Profile and post scraper:** Scraping profiles and posts by automating search and scrolling for twitter

• **Tiny C compiler**

Compiler for tinyC with x86-32 as the target architecture. Course project for Compilers course.

• **Organ Donor-Recipient Matcher**

Software Engineering course project, implemented using Django.

- **Donor-Recipient matching:** Utilized a greedy matching method to match Organ Donors and recipients using height, weight blood type and age. Email notifications are sent out to Donor and Recipient once match is found.
- **Fundraiser with notifications:** A fundraiser feature for donating to families of recipients or donors.
- **Blogging and simple text chat:** Blog with comments and a simple text chat between users.

VOLUNTEERING AND EXTRACURRICULAR ACTIVITIES

- **Volunteering for NAACL 2021:** Moderation for oral presentations and poster sessions.
- **Interested in language learning:** Casual learner of French and Japanese. Took French course in 4th semester
- **Filmmaking and Photography:** Member of the Technology Filmmaking and Photography society in freshman year. Was involved in the shooting and production of [Carpe Diem](#).
- **Karate and Martial Arts:** Learnt Goju Ryu karate from 6th to 11th grade. Reached golden brown belt (one step below black belt).