Prateek Chanda

Research Software Engineer (SCAI Center Fellow), Microsoft Research Lab, India

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EXPERIENCE

Microsoft Research	Technology for Emerging Markets	Bangalore , India
Research Software Engineer, SCAI Center Fellow	Supervisor : Dr. Amit Sharma	Nov 2019 - Present

MindNotes - Application for mental health diagnosis

- Collaborating with NIMAHNs team to develop an end-to-end e-mental health app in react-native and Azure Cognitive Services.
- Developed and shipped the entire backend architecture using Azure SQL Server with authenticated APIs connected to secure Azure SQL premises.
- Integrated Microsoft Graph API for building a patient-therapist communication platform with audio & text sharing capabilities.
- Design effective interventions for different section recommendations within app through causal embeddings learnt from user interactions and simulations.
- Build NLP models to build word embeddings from free text responses for detecting suicidal ideations and for improving recommendations.

Let's Talk: Microsoft Teams App for Mental Health

- Worked in a team of 15 people and led the development group in building a Microsoft teams chatbot application for recommending appropriate mental health resources within the workplace based on a user's emotional status.
- Used Azure Cognitive Services and custom NLP models to get appropriate recommendations. *Transitioned to Microsoft internal product*.

Complex Network Research Group	IIT Kharagpur	Kharagpur , India
Research Consultant (MHRD sponsored) *AI for Systems*	Advisor : Bivas Mitra , Niloy Ganguly	May 2019 - Nov 2019

- Performed a theoretical study on state of the art anomaly detection algorithms in enterprise systems and did a comparative study based on models using GANs and several data mining techniques on system logs like regression, clustering, Apriori algorithms.
- Proposed a data-driven framework for real time anomaly detection/troubleshooting of large-scale storage system failures leveraging weighted dependencies across subsystems with sudden dependency changes as an indication of anomaly. **Under Review PAKDD 2022**

Research Intern (Microsoft Research Sponsored) *Multi-User Activity Recognition*	Advisor : Bivas Mitra	May 2017 - Jun 2017

- Performed a theoretical study on traditional group activity recognition models based on sensor data.
- Based on temporal sensor data distribution, estimate missing data through Expected maximization algorithm
- Studied the correlation effect and causality for different user features like GPA, location, e.t.c w.r.t group activity and formation
- Contributed to the theoretical analysis of the model (initial working of GroupSense) that got acknowledged in Paper. *Project Docs | Code*

Machine Intelligence Unit	Indian Statistical Institute India	Baranagar , India
Research Intern May '18	Advisor : Dr. Ashish Ghosh	Project Report	Code

- Performed theoretical study on different Metric Learning algorithms to learn similarity metric from data distribution.
- Did an empirical analysis as well as evaluation of metric learning methodologies w.r.t different datasets like Iris, Wine Dataset, thus showcasing performance & limitations across various data distribution.

SunPy	NASA Open Source Software	Solar Data Analysis in Python	Remote, US
Google Summer of Code	Technologies : Python , Git	Dec 2016 - Apr 2018

- Collaborated with a team of 60 researchers to develop modules for efficient solar data retrieval, data processing and storage functionality.
- Implemented a solar data retrieval system to collect solar data from solar observatories based on date in an SQL data base to analyze different helio-features from the data over a period of 10 years. Used by the SunPy project. GitHub Link
- Implemented proposed solar image processing algorithm from research paper achieving better feature extraction with less noise. Got acknowledged along with researchers at NASA Goddard Space Flight Center in publications Astrophysical Journal , AGU/ NADA ADS , JOSS

PUBLICATIONS

- **MINDNOTES: A Mobile Platform to enable users to break stigma around mental health and connect with therapists**:
  CSCW Demo 2021   ACM DL
  Prateek Chanda, Amogh Wagh, Jemimah A Johnson, Swaraj Renghe, Vageesh Chandramouli, George Mathews, Sapna Behar, Poornima Bhola, Girish Rao, Paulomi Sudhir, TK Srikanth, Amit Sharma, Seema Mehrotra

- **Does the Relationship Between Modules Facilitate in Predicting System Anomaly?**: Under Review PAKDD 2022 Paper Link
  *Harsh Borse, **Prateek Chanda**, Paromita Dutta Soumik Sinha, Mainack Mondal, Bivas Mitra*

- **Human Computation and Crowdsourcing for Earth**: Accepted AAAI HCOMP 2021   DOI   *2nd Prize in Blue Sky Ideas track*
  *Yasaman Rohanifar, Syed Ishtiaque Ahmed, Sharifa Sultana, **Prateek Chanda**, Malay Bhattacharyya*

- **Reaching out : Towards a sustainable allocation strategy between users and therapists**: Accepted NeurIPS Machine Learning in Public Health   Acceptance Link
  Prateek Chanda

- **Distributed Anomaly Detection in Edge Streams using Frequency based Sketch Datastructures**: Under review VLDB 2022   pre-print
  Prateek Chanda, Malay Bhattacharyya

- **A Sketch Based Game Theoretic Approach to Detect Anomalous Dense Sub-Communities in Large Data Streams**: Under review
  AISTATS 2022   pre-print arXiv:2111.15525
  Prateek Chanda, Aadirupa Saha

- **Robust Deep Reinforcement Learning Control against Minimalistic Adversarial Attack in Atari Games** : Accepted *AAAI-22 Workshop on Robust Artificial Intelligence System Assurance (RAISA)*   Acceptance Link   Paper
  Prateek Chanda

- **A Novel Graph Based Clustering Approach to Document Topic Modeling**: Accepted *9th ICCCNT 2018, IISc* IEEE Xplore
  Prateek Chanda, Asit Kr Das

PROJECTS	MORE PROJECTS ON GITHUB : PRATEEKIIEST/REPOSITORIES

EHR Analysis in Sage BioNetworks Advisor : Dr. Malay Bhattacharyya, ISI
- Worked on EHR analysis of COVID-19 patients for the Sage Bio-Networks competition.
-Proposed a novel interpretable model that takes feature dependecies into consideration for better accuracy prediction - *AI for Science NeurIPs mentorship program*
-Worked on an ensemble of models include RandomForest, GNN(Graph Neural Networks) to check what relevant features are important in deciding whether a patient is at higher risk of hospitalization

Recommendations for Mental Health Therapeutic activities in MindNotes - Microsoft Research India Advisor : Dr. Amit Sharma
- Developed user feature embeddings based on user responses logging and telemetry logging for building recommendation models for recommending different therapeutic activities and sections of the app as interventions to the user.
- Started with initial collaborative and content based filtering for recommendations, and further developed a causal recommendation model where each micro-intervention was indicated as treatment to the user.

Anomaly Detection in Large Online Network Streams Advisor : Dr. Malay Bhattacharyya, ISI
- Worked on exploring Heavy-Hitter applications in large network streams using approximate frequency based sketch data structures and implemented statistical tests like kolmogorov smirnov tests and chi-square tests to detect anomaly in the network distribution.
-Worked on a distributed setting of offline network logs to propose a faster anomaly detection method using statistical tests with better theoretical guarantees than traditional methods.

ACHIEVEMENTS

- **AISTATS 2022 Mentorship Program**: Selected for AISTATS Mentorship Program to work with Aadirupa Saha at Microsoft Research NYC
- **AI for Science NeurIPS Workshop Mentorship Program**: Selected for AI for Science NeurIPS Mentorship Program to work with Malay Bhattacharyya at Indian Statistical Institute
- **Microsoft Garage Hackathon 2020**: Recipient of Hackathon 2020 NGO award from Microsoft Garage India under AI for Social Good.
- **Microsoft Research India Sponsorship**: Recipient of MSR India Sponsorship Funding for internship work at IIT Kharagpur
- **GAABESU research award IIEST**: Received GAABESU(IIEST) research award for research contributions for academic year 2018
- **JBNSTS Scholar**: Selected for Jagadis Bose National Science Talent Search Scholarship
- **RMO:** Qualified for Regional Mathematics Olympiad
- **AIEEE Merit**: Within top 0.26% of applicants in All India Engineering Entrance Exam approx. 1.3 million people
- Qualified for **Facebook HackerCup 2019** & **Google Kickstart 2019**

SKILLS

- **Languages**: Python, C++, SQL, Java, C#, TypeScript   **Technologies**: Azure, Azure ML Studio, GitHub, GitLab, Jekyll, GCP
- **Libraries**: TensorFlow, PyTorch, Scikit-Learn, Pandas, Jupyter, Microsoft Graph SDK

EDUCATION

Indian Institute of Engineering Science and Technology, Shibpur   Howrah, India
Bachelor of Technology in Computer Science & Engineering; *First Class Distinction Honors*   GPA: 8.86/10.0   WES: 10/10   2015 - 2019

Thesis: *Avoiding Past Choice Regrets: A Game Theoretic Community Detection using Temporal Information*
    Advisor: Malay Kule & Dr.Susanta Chakraborty   Thesis Report   *Accepted at AAAI ML4OR workshop*

Relevant Coursework: Data Structures & Algorithms, Operating Systems, Database Management, Cloud Computing & Big Data, Machine Learning & AI, Probability & Statistics, Discrete Structures, Computer Graphics,Computer Networks, Computer Architecture

POSITIONS OF RESPONSIBILITY

- **Program Committee for ODD SIGKDD workshop** 2021 - Workshop Link
- **Reviewer** for IEEE Transactions on Mobile Computing , COMSNETS, AISTATS, Journal of Open Source Software
- **Google Code In**, **GSoC Mentor** : Mentored over 80 students under Google Code In 2018, Hacktoberfest 2018, 2017
- Leading the open source club at Campus as a GitHub Campus Expert - organising hackathons and open source mentorship programs in campus and engaged students from different departments in open source