Janmajay Singh

Contact Information

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Research Interests

My research focuses on sequential modeling where I have worked at the intersection of predictive, causal and mixture models. I have conducted research in biomedical (DNA sequence, ICU, ECG), recommendation and NLP domains and have co-authored papers published in **UAI**, **RecSys** and **CinC**. My contributions have also been acknowledged in a recent paper on Multi-Armed Bandits published in **ICML**.

Education

SRM University, Chennai, Tamil Nadu, India

Bachelors in Technology, Computer Science and Engineering (July 2013 - June 2017)

- CGPA: 9.4/10

Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

Special Student, Electrical Engineering and Computer Science (September 2015 - May 2016)

Relevant Work Experience

Fujifilm Corp. - R&D HQ, Kaisei, Kanagawa, Japan

Researcher - Quantitative Biology **November, 2020 - Present**

Part of the Liquid Biopsy team at the Imaging Technology Center. Primary responsibilities include predictive model design and development for cancer prediction from blood DNA samples. Secondary responsibilities include algorithm design to reduce noise from DNA sequencing process. Proposed noise reduction algorithm successfully reduced measurement noise by 57% compared to targeted 10%, substantially improving the project workflow.

Fuji Xerox Co., Ltd. - R&D HQ, Yokohama, Kanagawa, Japan

Researcher - Predictive Models **September, 2018 - October 2020**

Responsibilities included researching long-term predictions in sequential recommender models and interpretability. Also worked on modeling missing patterns in observation health record data from the ICU, and designed algorithms which enabled early diagnosis of diseases.

Visiting Scholar - Affective Computing **September, 2017 - July, 2018**

Worked on sentiment analysis models and their interpretability using NLP and reinforcement learning respectively. Also learned about orchestration frameworks for IoT devices.

Voonik Technologies Pvt. Ltd. - R&D, Bangalore, Karnataka, India

Research Intern **December, 2016 - June 2017**

Worked on building a real-time recommendation system from scratch, primarily focusing on latency minimization and state-of-the-art algorithm reproduction. Successfully completed a system compatible with limited hardware, employing a graph-based algorithm and a Neo4j database. The project was successfully deployed for a user-base of 10,000 users.

Academic Projects

Massachusetts Institute of Technology - CSAIL

Student Project **March, 2016 - June 2016**

Worked on a research project under Prof. P.H. Winston. Framed a doctor-patient conversation such that it may be used in a AGI system called "Genesis". Experiments were conducted to explore the system's feasibility in a clinical decision support setting for real time diagnosis. Conclusions

drawn included confirming the system's feasibility for said task, with the limitation of a lack of medical-specific lexicon. The system's lexicon was expanded, showing improved inductive abilities.

SRM University - Dept. of Computer Science

Project Mecura **May, 2014 - May 2015**

Initiated a project for developing a Electronic Medical Record-keeping System for the university hospital. Coordinated a team of 8 members to successfully design a website and back-end system for storing patient health record information for easy access. Learned full-stack development, privacy challenges in healthcare data and leadership skills.

Publications

Janmajay Singh, Oshiro Kentaro, Raghava Krishnan, Masahiro Sato, Tomoko Ohkuma and Noriji Kato. 2019. Utilizing Informative Missingness for Early Prediction of Sepsis. Computing in Cardiology Conference (*CinC '19*).

Masahiro Sato, **Janmajay Singh**, Sho Takemori, Takashi Sonoda, Qian Zhang and Tomoko Ohkuma. 2019. Uplift-based Evaluation and Optimization of Recommenders. ACM Conference on Recommender Systems (*Recsys '19*).

Masahiro Sato, **Janmajay Singh**, Sho Takemori, Takashi Sonoda, Qian Zhang and Tomoko Ohkuma. 2020. Modeling User Exposure with Recommendation Influence. ACM/SIGAPP Symposium On Applied Computing (*SAC '20*).

Sho Takemori, Masahiro Sato, Takashi Sonoda, **Janmajay Singh** and Tomoko Ohkuma. 2020. Submodular Bandit Problem Under Multiple Constraints. Proceedings of the 36th Conference on Uncertainty in Artificial Intelligence (UAI '20)

Joachim Behar, Chengyu Liu, Kevin Kotzen, Kenta Tsutsui, Valentina Corino, **Janmajay Singh**, ..., Gari Clifford. 2020. Remote health diagnosis and monitoring in the time of COVID-19. Physiological Measurement, November 2020.

Under Review

Janmajay Singh, Masahiro Sato, Tomoko Ohkuma. On Missingness Features in Machine Learning Models for Critical Care: Observational Study.

Awards

Outstanding Research Award: Twice (2020 and 2021) recipient, usually given to 10 of ∼300 members of the R&D group.

Physionet Challenge Finished 5th of 104 teams internationally by building a highly accurate model for early diagnosis of sepsis in a population of ICU patients.

Other Education

MITx - Statistics and Data Science MicroMasters, edx.org

An online Masters program hosted by MIT. The courses fulfill the MIT IDSS PhD credit requirements. 4/4 completed.

- 14.310Fx: Data Analysis in Social Science
- 6.431x: Probability
- 6.86x: Machine Learning with Python
- 18.6501x: Fundamentals of Statistics

Computer Skills

- Languages: Python, R, Java, C++, bash scripting.
- Databases and Tools: MySQL, PostgreSQL, MongoDB, Neo4j, Kafka