Rohan Sukumaran

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Research Interests Computational Health, Privacy Preserved Machine Learning, Adversarial Machine Learning, Graph Neural Networks, Agent Based Modeling

Education

Indian Institute of Information Technology, Sri City — Andhra Pradesh, IN
Bachelor of Technology in Computer Science and Engineering — Aug 2016 - June 2020

Publications

R. Sukumaran, et al., **Enhanced Text Classification using Proxy Labels and Knowledge Distillation**, *short paper* **ACM CODS-COMAD**, 2021

P. Patwa, V. Reddy, **R. Sukumaran**, et al., **Can Self Reported Symptoms Predict Daily COVID-19 Cases?**, *Oral Presentation at AI4SG Workshop* ***IJCAI-21***

R. Sukumaran, et al., **COVID-19 Outbreak Prediction and Analysis using Self Reported Symptoms**, *Journal of Behavioural Data Science*, 2021

D Tula, P Potluri, S Ms, S Doddapaneni, P Sahu, **R. Sukumaran**, et al., **Bitions@ DravidianLangTech-EACL2021: Ensemble of Multilingual Language Models with Pseudo Labeling for offence Detection in Dravidian Languages**, *DravidianLangTech Workshop* ***EACL-21***

A. Gupta*, **R. Sukumaran***, et al., **Hostility Detection and Covid-19 Fake News Detection in Social Media**, *CONSTRAINT Workshop* ***AAAI-21*** *- Non archival*

S Shankar*, R Kanaparti*, A Chopra*, **R. Sukumaran**, et al., **Proximity Sensing: Modeling and Understanding Noisy RSSI-BLE Signals and Other Mobile Sensor Data for Digital Contact Tracing** *ML4MH Workshop* ***NeurIPS-20***

Under Review

P. Nandakishore, M. Liu, R. Prakash, S. Gourneni, **R. Sukumaran**, et al., **Deviations in Predicted cases in the US during early months of 2021 relate to rise in B.1.526 and its family of variants**, *British Medical Journal (BMJ)*

D. Tula*, **R. Sukumaran***, et al., **EfficientBN: Curriculum Learning for Progressive Training of ONLY Batch Normalization**, *Pre-registration Science NeurIPS 2021*

A. Singh, V. Sharma, J. Mose, **R. Sukumaran**, et al., **Reconstruction Benchmark for Obfuscated Representation**, *NeurIPS Dataset and Benchmark Track 2021*

R. Jain, U. Gupta, S. TV, **R. Sukumaran**, et al., **Analysis of Tata-1mg data for covid 2nd wave prediction in India**, *Journal of the American Medical Informatics Association (JAMIA)*

M. Liu, K. Ramakrishna, C. Zhou, S. Manukonda, R. Mantena, R. Raskar, M. Morales, T. Kingsley, S. S. Feldman, **R. Sukumaran**, et al., **Clustering and classification-based review of post-Emergency Use Authorization COVID-19 vaccines' safety from the Vaccine Adverse Reporting System (VAERS)**, *Journal of the American Medical Informatics Association (JAMIA)*

Research Experience

Data Science and Privacy, PathCheck Foundation (MIT spin-off) — Cambridge, MA
*Advisor - Prof. Ramesh Raskar - **MIT Media Lab*** — Dec 2020 - Present

- Research Manager - Co-leading the Data Science and Privacy teams in various research projects towards publication and/or grant opportunities.
- Co-founded the Data Informatics Center for Epidemiology (DICE) at PathCheck, with *Prof. Manuel Morales - University of Montreal, Quebec* and *Prof. Sue Fieldman - University of Alabama, Birmingham*, as Deputy Director - Scientific Programs.

Applied Research, Swiggy — Bangalore, IN
Advisor - Sundeep Teki, Ph.D (Ph.D UCL, post-doc Oxford) — Feb 2020 - May 2020

- Implemented and deployed a novel knowledge distillation model based on Transformer architecture for product category classification. Used semi-supervised learning and weak supervision to handle the large unlabelled corpora.
- Developed a pipeline for zero shot classification of customer intent in code-mixed chat conversations

Advising Experience

Co-advised a cohort of undergraduate students for a project titled **Offense Detection in Dravidian Languages using Code-Mixing Index based Focal Loss and Cosine Normalization** , currently in R&R with minor revisions at the Springer Nature Computer Science Journal.

Awards and Grants

- **Global Finalist** in the **MIT SOLVE** Health Security and Pandemics Challenge for our solution - *Crowdsourced Epidemic Analytics via Citizen Engagement* - across 2,600+ applicants **globally**.
- **Honorable mention** in the Trinity Challenge for our solution of *Privacy preserving crowdsourced epidemiology* across 350+ teams **globally**.
- **Top 5** across the world in **Facebook Data for Good** - COVID-19 Symptoms Survey Challenge across 35 teams.
- **Top 10** in first round of **XPRIZE Pandemic Response Challenge** globally across 300+ teams.
- Conference Grant/Scholarship to attend IJCAI 2021, ICLR 2021, ICML 2021, MLHC 2021
- 2 posters accepted at the **Michigan AI Symposium 2020**.
- Project on Diabetic Retinopathy Detection selected as top 20 projects across India selected by **Google AI**.
- Central Board of Secondary Education - **top 0.05%tile** in the country (AISSE).

Teaching Assistant

Information Retrieval	Prof. Rajendra Prasath (*Ph.D IIT Kharagpur)*
Database Management Systems	Prof. Prerana Mukherjee (*Ph.D IIT Delhi*)
Programming in C	Prof. Venkatesh Vinayakarao (*MS CMU, PhD IIIT Delhi*)

Projects

Semi-supervised knowledge distillation for product category identification — Applied Research, Swiggy
Jan 2020 - Apr 2020

- Deployed a model with 33x fewer parameters (but near-equal perf) into production for product category identification with semi supervised learning and weak supervision.

Spatio-Temporal Private Synthetic data generation — Data Science, PathCheck Foundation
Mar 2021 - July 2021

- Analyzed various algorithms for private data synthesis. Explored DP based ensemble of models to generate private data with varying epsilion.

Professional Experience

OpexAI LLC — Bangalore, IN
Artificial Intelligence Developer — May 2018 - July 2018

- Built a scalable crowd analytics module using MASK R-CNN for analysing attentiveness of large crowds using mounted cameras during large scale expos.
- Developed a computer vision algorithm to identify damaged parts of a car for easier processing of insurance claims.

Skills and Tools

- **Languages** : Python, R, JavaScript, HTML, CSS, SQL, LaTeX
- **Libraries and Frameworks** : PyTorch, TensorFlow, Scikit - Learn
- **Applications and Tools** : Docker, Jira

Voluntary Work

- Reviewer at the DravLangTech workshop at EACl 21, CONSTRAINT workshop at AAAI 21 and SemEval Task COLING 20 and volunteer at IJCAI 2021
- Organizing committee member of the "Vaccines for all" conference by Trusted Pandemic Technologies and MIT.

Leadership Experience

- **Google AI Explore ML Facilitator** - Taught basic to advanced ML to **700+** students.
- **Founding head** of AI ML club at the Indian Institute of Information Technology, Sri City.
- **Secretary, TechFesia** - First international technical festival of Indian Institute of Information Technology, Sri City - with 1000+ participants.