Vedant Nanda

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RESEARCH PROJECTS

Mitigating Discrimination in Targeted Advertisements
Advisor: Prof. Krishna P. Gummadi
Paper in pipeline; showed through experiments the effectiveness of proposed approach to harden an ad platform against discriminatory advertisers. Collaboration with AT&T research, New York.

Actionable Recourse Through Role Models
Advisor: Prof. Krishna P. Gummadi
Paper submitted to WWW'19; proposed an algorithm to find a "role model" for users who received undesirable outcome in automated decision making systems - with black-box access to the model - such that changing user's features to that of the role model would result in favorable outcome with minimum effort; ran experiments to demonstrate the fairness in efforts and long term impacts of such explanations for minority groups.

KillFie: Understanding Dangerous Selfies (Undergrad Thesis)
Advisor: Prof. PK
One publication; work covered by NPR, BBC World, Times of India and Economic Times. App: bit.ly/saftie-cam

Harmony: A Mobile App to Assist Schizophrenia Patients
Advisor: Prof. Pushpendra Singh
Developed an android app to assist patients suffering from schizophrenia which is being used by patients in AIIMS, India's leading medical school.

An Empirical Analysis of Free Basics
Advisor: Prof. PK, Prof. Rijurekha Sen
Two publications; Provided a first large scale data driven analysis of Facebook's free basics program. Collected and analyzed data from web services made as part of research: newsbugle.mpi-sws.org and myvoice.mpi-sws.org. Combined 1000+ daily active users; total 100,000+ users.

RESEARCH INTERNSHIPS

MAY 2018 - AUGUST 2018
Max Planck Institute for Software Systems, Saarbrücken
Research Intern
Advisor: Prof. Krishna P. Gummadi
Proposed algorithms to mitigate the effect of discriminatory attacks in the context of targeted advertisements, along with techniques to measure and detect discrimination. Showed the effectiveness of proposed algorithms through a theoretical proof and empirical results. Full paper to be submitted to IEEE S&P. I briefly explored adversarial machine learning and data fairness in automated decision making as well. I showed how the activation patterns of layers of a neural network differ for adversarial samples as compared to legitimate samples. For the data fairness project, I showed how a change in the learning process of decision trees could guarantee that giving optional information would not hurt a candidate in an automated selection process. Continued working after the internship; developed algorithms to provide actionable recourse for automated decision making models.

MAY 2017 – AUGUST 2017
Precog Research group, IIIT Delhi
Research Intern
Advisor: Prof. PK
Made a facebook chatbot and an android app to collect dangerous selfie spots across the globe. This systems has gathered 2500+ dangerous selfie locations. Chatbot: fb.me/saftiebot; App: goo.gl/2sIdYT

EDUCATION

2015 – 2019 | **Bachelor of Technology**
Computer Science and Engineering
GPA: 9.64/10, in top 5% of institute
IIIT Delhi, India

AWARDS & ACHIEVEMENTS

2018	Best TA award for Data Structures and Algorithms. Core CS course.
2017	Selected for SN Bose scholars program. Awarded to only 50 students across India; deferred in favor of internship at MPI.
2016,'17 & '18	Dean's List for academic excellence.
2016,'17 & '18	Chairman Merit scholarship of Rs. 100,000.
2015	KVPY scholarship, awarded to brilliant young scientists across India.
2015	Secured an All India Rank of 804 in JEE mains, out of 1.5 million candidates.

PUBLICATIONS

Mitigating Discrimination in Targeted Advertisements *paper being drafted*, S&P'19. First author paper.

Role Models as Contrastive Explanations & a Connection to Effort-reward Fairness *under review*, WWW'19. First author paper.

Vedant Nanda, H.Lamba, D.Agarwal, M.Arora, N.Sachdeva, P.Kumaraguru (2018). Stop the KillFies! Using Deep Learning Models to Identify Dangerous Selfies *Companion Proceedings of the The Web Conference 2018*, WWW'18.

S.Singh*, **Vedant Nanda***, R.Sen, S.Sengupta, P.Kumaraguru, K.P.Gummadi (2017). Leveraging Facebook's Free Basics Engine for Web Service Deployment in Developing Regions. *Proceedings of ICTD'17*.

S.Singh*, **Vedant Nanda***, R.Sen, S.Ahmad, S.Sengupta, A.Phokeer, Z.A.Farooq, T.A.Khan, P.Kumaraguru, I.A.Qazi, D.Choffnes, K.P.Gummadi (2017). Empirical Analysis of Facebook's Free Basics. *SIGMETRICS '17 Abstracts*.

* Co-first author publication(s)

RESEARCH INTERESTS

Human-centered ML; Fairness, Accountability and Transparency in Machine Learning; Social computing; Computational Social Science; Security and Privacy in ML and social systems; Natural Language Processing.
Broadly, I am interested in understanding the complex dynamics which occur in societal scale systems through quantitative measurements, machine learning, natural language processing and sociolinguistics. I am also interested in building machine learning systems which are fair, accountable, interpretable, secure and privacy preserving.