# Kritika Prakash

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Github, LinkedIn, Website

## Education

**International Institute of Information Technology, Hyderabad** **2016–Present**
*B.Tech (Honors) + MS by Research in Computer Science Engineering* *CGPA: 8.87/10*
Dean's Distinction List Awardee (five times) for Academic Excellence: top **5%** of the batch

Advisors: Prof. Praveen Paruchuri, Prof. Sujit Gujar: Machine Learning Lab, IIIT Hyderabad

## Work Experience

**Research Scientist + Differential Privacy R&D Lead, OpenMined** **May '20 - Present**
*Creating an automatic sensitivity for DP in DL, leading all DP efforts at OpenMined*

**Research Intern, TCS Research & Innovation Labs, Hyderabad** **May '19 - July '19**
*Built algorithms for Power Trading in Smart Grids*

**ML Intern, Microsoft, Bangalore** **May '16 - July '16**
*Created a Probabilistic Resume Classification and Visualization Model for Candidate Selection*

**Teaching Assistant, IIIT Hyderabad** **Aug '17 – May '20**
*Created assignments, conducted tutorials and tournaments, evaluated tests and projects*
Courses: Machine Learning, Artificial Intelligence, Database Systems, Optimization Methods

## Publications

**Towards General Purpose Infra for Protecting Scientific Data under Study** **PPML NeurIPS 2020**
**K. Prakash**, *A. Trask (Senior Researcher at DeepMind, Founder - OpenMined)*
We propose a pipeline of scientific experimentation which enables data usability by combining remote execution, federated learning and Differential Privacy. We create a new method of applying Differential Privacy at scale.

**Prediction Based Strategies for Negotiations with Dynamically Changing RV** **GDN 2020**
*A. Srinivas,* **K. Prakash**, *N. Singh, P. Paruchuri*
Created the LSTM based Reservation Value prediction approach, as well as methods and metrics of evaluation.

**VidyutVanika: An Autonomous Broker Agent for Smart Grid Environment** **PASS 2019**
*S. Ghosh,* **K. Prakash**, *S. Chandlekar, E. Subramanian, S. Bhat, P. Paruchuri, S. Gujar*
Built algorithms for Power Trading in Smart Grids in a simulated environment, given consumer and wholesale markets, customers and power generating companies.

**Privacy Preserving Machine Learning, A survey** **ArXiV 2019**
**K. Prakash**, *S. Gujar*
We provide a broad analysis and comparison of various methods used to make Machine Learning differentially private.

## Skills

**Languages**: Java, Python, C++, Matlab, R, Solidity

**ML Tools**: PyTorch, Keras, Tensorflow, Azure ML, AWS, PySyft

**Software**: HTML, CSS, TeX, AutoCAD, Catia

**Frameworks**: Git, Maven, Truffle, MySQL, OpenGL

## Research Interests

Deep Learning Optimization, Reinforcement Learning, Differential Privacy, Game Theory, Discrete Mathematics

## Major Projects

**Differentially Private Deep Learning Framework**      **Differential Privacy**
*Developing a PyTorch API to support Differential Privacy for training DL algorithms*      *2020*

**Automated Ad Exchange Trading Bot**      **Game Theory**
*Developed an Ad Exchange trading agent using Java: **3rd place in course tournament***      *2019*

**Multi-Agent POMDP Solver**      **Multi-Agent Systems**
*Created a POMDP solver using RL to increase co-operation among agents in Python*      *2017*

**E-mail Author Identification**      **Machine Learning**
*Developed a Hierarchical-LSTM based classifier to identify the email author in Python*      *2017*

**Image2Latex**      **Digital Image Processing**
*Developed a tool for Latex Generation from Images of Equations in MATLAB*      *2018*

**Decentralized Food-Delivery App**      **Blockchains**
*Created a Smart Contract based Ethereum Dapp for a Decentralized Food-Delivery System*      *2018*

**Multi-Agent Automated Negotiation Bot**      **Multi-Agent Systems**
*Created a Multi-Agent Automated Negotiation Bot in Java*      *2017*

## Achievements & Honors

**OpenMined Featured Contributor** September, 2020

Selected for **Google Research Summer School**, 2020

Ranked **Third** in Flipkart Machine Learning Challenge out of **19,000** participants from top Indian universities

Awarded **National Talent Search Scholarship**: National Rank **23** out of **1,000,000** competitors

## Positions of Responsibility

**Present**: Lead, Differential Privacy RD Team, OpenMined

**Present**: Head, Lean In, IIIT Hyderabad Chapter

**Present**: Member, Student Academic and Counselling Board (SACB), IIIT Hyderabad

**Present**: Member, Mozilla Community, IIIT Hyderabad

**Summer'17**: Organized Summer School on Privacy & Security, IIIT-Delhi with **Prof. Ponnurangam K**

**Spring'18**: Active Member of Women Techmakers Club, Hyderabad

**Monsoon'17**: Mentor, IIIT-Hyderabad

**Monsoon'15**: Literary Club Head, IIITD&M, Kancheepuram

**2014-16**: Class Representative, IIITD&M, Kancheepuram

## Relevant Coursework

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|---|---|
| Algorithms & Data Structures | Machine Learning |
| Artificial Intelligence | Differential Privacy |
| Optimization Methods | Reinforcement Learning |
| Distributed Systems | Blockchains |
| Compilers & Theory of Computation | Game Theory |
| Computer Graphics | Digital Image Processing |
| Database Systems | Graph Theory |
| Software Architecture | Multi Agent Systems |
| Computer Networks & Operating Systems | Designing Intelligent Systems |
| Information Security | Abstract Algebra & Discrete Mathematics |