Sucheta Ravikanti			**160040100**	
Electrical Engineering			**Dual Degree (B.Tech. + M.Tech.)**	
Indian Institute of Technology, Bombay			**Gender: Female**	
Specialization: Communication & Signal Processing			**DOB: 26-03-1999**	

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	-
Intermediate	TSBIE	FIITJEE	2016	98.40%
Matriculation	CBSE	DAV Public School	2014	10

Auxiliary Degree: Pursuing a **Minor** *in* **Computer Science and Engineering**

PUBLICATIONS

- "Latency and timeliness in multi-hop satellite networks", *Published in* **IEEE ICC '20, Dublin, Ireland**
- "Analysing the Perception towards Electric Vehicles in India", ***Transportation Research Board '21**, USA (under review)*

ACCOLADES

- Recipient of **Institute Academic Award - I** (given to **54/3k+**) for exemplary academic performance in the 4th year ['20]
- Conferred with **Department Organizational Color** for showcasing excellent organizational skills ['20]
- Recipient of **Undergraduate Research Award (URA01)** for remarkable contribution to research ['20]
- Received **AP grade** (given to **top 3%** out of **919** students) for exceptional performance in **Linear Algebra** ['17]
- Awarded **Branch Change** (given to **93/900+**) for academic excellence to Electrical Engineering, Dual Degree ['17]
- Secured **International Rank 18** and awarded **Gold Medal** in International Mathematics Olympiad by SOF ['13]

PROFESSIONAL EXPERIENCE AND KEY PROJECTS

Satellite Multi-Hop Queuing Systems | Aalborg University [May '19 - Jul '19]
Visiting research intern in **Connectivity Lab** *under* **Prof. Beatriz Soret** *| Awarded* **LoR**   **Aalborg, Denmark**

Approach	- Designed systems for **time-sensitive** applications, using multi-satellite setup to relay updates to the terminus - Built a **MATLAB** tool for the system complying with **Queuing Theory**, by modelling it as **M/M/1** queue series - Integrated features like uplink intermediate poisson & periodic traffics, packet dropouts and re-transmissions - Analyzed **Age of Information**, a latency-sensitive metric for varied settings; supported by analytic guarantees
Result	- Obtained **tradeoffs** in number of satellites, system utilization & load distribution for **optimal performance**

Crop Yield Estimation using Remote Sensing Imagery | Wadhwani AI [May '18 - Jul '18]
Part of the team that develops AI-based innovations for a broad range of societal domains | Awarded **LoR**   **Mumbai**

Approach	- Developed a **scalable**, **accurate** & **inexpensive** alternative to traditional field surveys to estimate crop yield - Reduced high-dimensional **200GB+ 36**-band MODIS images to **32**-bin histograms by **permutation invariance** - Accounted for spatio-temporal dependence lost due to the histograms by adding **Gaussian Process** layer
Results	- Attained **87%** accuracy on soybean crop in **1300** USA counties via **CNN** with **Gaussian Process** layer on **GPUs** - Prepared **district-level** satellite data for India on **Google Cloud Platform** using landcover & GeoJSON data

Indian Customer Behavior towards Electric Vehicles [Jan '20 - Jul '20]
Research Project Guide: **Prof. Arnab Jana**   **IIT Bombay**

- Tailored a **35-feature** survey, predicting Indian buyer propensity to spend higher on **EVs** than conventional vehicles
- Achieved **72%** accuracy on a **logit** classifier & performed **Shapley Analysis** to identify key adoption barriers & promoters
- Published polices for automotive companies to base their sales strategy & for the Government to expedite EV adoption

Age of Information (AoI) Bandits | Master's Dissertation [May '20 - Present]
Guide: **Prof. Sharayu Moharir** *| Working on a paper for submission in* **IEEE ICC '21, Montreal, Canada**   **IIT Bombay**

- Conceptualized the setup of **IoT** sensors relaying updates to the destination, via channels with **unknown success rates**
- Modelled the channels as stochastic arms & implemented novel **Multi-Arm Bandit** algorithms to learn the optimal policy
- Achieved **sublinear** regret on AoI & Throughput metrics; substantiated the results by deriving **theoretical upper bounds**

Batch Arm Pulls for Stochastic Multi-Armed Bandits [Aug '19 - Nov '19]
Research Project Guide: **Prof. Sharayu Moharir**   **IIT Bombay**

- Designed bandit algorithms for jointly pulling **K** arms among **N** arms in simple & cumulative regret minimization settings
- Reduced the sample complexity by **N/K** over **state-of-the-art** in simple regret setting, using **Aggressive Elimination** method
- Outperformed the baseline cumulative regret, by proposing & implementing **Look-ahead Batch Gaussian Process UCB**

EthVote: Decentralized App for Ballot Voting | Web & Coding Club, IIT Bombay [Oct '19]
Submitted in **Block.Venture** *Hackathon sponsored by* **BitGrit** *| Secured* **1st position** *for the best idea and implementation*

- Developed a **blockchain-based** Electronic Voting Solution on **Solidity** to organize **secure** and **transparent** elections
- Ensured **voter privacy** and **integrity** by employing Linkable Spontaneous Anonymous Group Signatures (LSAG)

COURSE PROJECTS

Transformer Based Reinforcement Learning for Games
[Aug '19 - Nov '19]
*Course: **Intelligent Learning Agents** | Published a preprint on arXiv, **350+** reads on ResearchGate*   **Computer Science**
- Proposed a deep reinforcement learning architecture leveraging **transformers** to train an agent to play **ATARI** games
- Experimented with **DQN-LSTM** & **DQN-transformer** on **PyTorch** to perform benchmarking on partially observable MDP

Video Denoising using Low Rank Matrix Completion
[Jan '20 - Jun '20]
*Course: **Advanced Image Processing***   **Computer Science**
- Improved the average **Signal-Noise Ratio** by **79%** on standard video datasets corrupted with high amount of **mixed noise**
- Generated **low-rank** matrices for all **8x8** patches by grouping similar patches across time-axis, obtained by motion vectors
- Employed threshold-based heuristics to mask the corrupted pixels in the matrices and filled them by **Fixed Point Iteration**

Genre Identification
[Jan '18 - Apr '18]
*Course: **Machine Learning***   **Computer Science**
- Achieved an accuracy of **56%** in classifying music into one of the **10 genres**, by training a random forest on **1M+** tracks
- Added **Timbre**, an acoustic feature, for the loudest parts of the tracks; resulted in improved **PCA** clustering of genres
- Applied **Bayesian Optimization** for tuning hyperparameters, providing a higher speedup than the standard **Grid Search**

Computationally Efficient Path Planning on Arbitrary Graphs
[Jan '20 - Jun '20]
*Course: **Wavelets***   **Electrical Engineering**
- Implemented an efficient path planning algorithm on graphs by gaining an **exponential speedup** to **Dijkstra's** algorithm
- Employed Dijkstra's algorithm on the distance-dependent downsampled graph, having exponentially fewer edges & nodes
- Demonstrated the efficacy of **Kroner Reduction** based graph downsampling method, followed by effective sparsification

Coconut to Copra Non-Invasive Yield Estimation
[Jan '19 - Apr '19]
*Course: **Electronic Design Lab***   **Electrical Engineering**
- Obtained a **correlation coefficient** of **0.94** for the model that predicts copra yield from physical non-invasive parameters
- Prototyped a **low-cost** & **unorthodox** setup by using non-intrusive methods - **Ultrasonic** & **Impedance Spectroscopy**

COURSES AND TECHNICAL SKILLS

Computer Science	• Design & Analysis of Algorithms (Ongoing), Foundations of Intelligent Learning Agents, Advanced Image Processing, Machine Learning, Digital Image Processing, Operating Systems, Data Structures & Algorithms
Security	• Cryptocurrencies & Blockchain Technologies, Network Security, Introduction to Cryptography, Cryptology
Technical Skills	• **Languages & Packages:** C++, Python, JAVA, Solidity, HTML, CSS, PyTorch, Tensorflow, SciKit Learn, Open CV • **Softwares:** MATLAB, R, Android Studio, SolidWorks, AutoCAD, Git, GNU Radio, Quartus, Adobe Photoshop

LEADERSHIP ROLES

Cabinet Head │ Department Academic Mentorship Program & Academic Cabinet
[Feb '20 - Present]
*Co-leading a **3-tier** team of **15** DAMP Heads across **13** departments; **250+** mentors catering to **1200+** students across **7** batches*

Academic Rehab	• Tailoring & executing the **Academic Rehabilitation Policy (ARP)**, aiding **200+** academically weak students • Pioneering a proposal for the introduction of **ARP TAs** in **100+** courses, in liaison with **10** departments
Initiative	• Instituting **Improvement Program** for **40+** requisite courses in **11** departments, to cater **200+** students
Student Mentor	• Part of Institute & Department mentor teams for **2 years** based on strong **peer-review** & **overall performance** • Mentored **11** freshers **(ISMP)** & **24** sophomores **(DAMP)** in their academic, personal & co-curricular pursuits

Editorial Board Member │ Insight │ Official Student Media Body of IIT Bombay
[Apr '18 - Mar '19]
*Part of a 21-membered team heading **150+** journalists | **200+** articles | **50+** videos | **10k+** readers | **400k+** web views*

Highlights	• Revitalized & overhauled **Career Series** after a **5 year** hiatus, making it reader-friendly; garnered **50k+** reach • Authored **4+** investigative pieces on issues like **Mess Infrastructure**; addressed student concerns; **20k+** reach
Analysis	• Spearheaded the flagship **Senior Survey**; visualized the responses of **900+** graduating students interactively

Convener │ Maths and Physics Club, IIT Bombay
[Apr '17 - Mar '18]
*Club fostering the enthusiasm of students in Maths & Physics; catering to **500+** students on-campus & **9k+** online enthusiasts*

Highlight	• Orchestrated & hosted **Maths Bazinga**, the Institute Mathematics Quizzing Championship; **300+** crowd
Designing	• Ideated and designed **15+** event posters and online campaigns, witnessing **33% YoY** rise in the participation

CERTIFICATIONS AND EXTRACURRICULAR ACTIVITIES

Finance	• **Certifications** in Bloomberg Market Concepts, Portfolio and Risk Management, Trading Algorithms
Literary	• Editor, Official **Mood Indigo** Newsletter ['17] │ **School Literary Captain**; catered to **200+** enthusiasts ['13]
Music	• **Intermediate** Level in **Piano** │ Lead Pianist of an all-Freshmen Band, performed to a **500+** crowd ['16]
Others	• Certified with **Introductory Scuba Dive** │ **80+** hours of social service under **National Service Scheme (NSS)**

Scholastic achievements and extracurricular activities are not verified by the Placement Cell