

# Sidhant Nagpal

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github.com/sidhantnagpal

## EXPERIENCE

### Tower Research Capital

Software Engineer III

Singapore

Jun 2019 - present

- Developing **order entry** and **market data** systems for APAC exchanges (KRX, TSE, Taifex, SET/TFEX) with special emphasis on **low-latency**. **Keywords:** C++17, STL, Boost, Python, Pybind11; Socket programming (TCP, UDP), IPC mechanisms (shared memory, queues), RPC mechanisms, Kernel bypass (Solarflare, Mellanox, onload).
  - Created the native trading platform for **KRX** and implemented ARIA encryption, **reducing the latency** (in micros) for order entry by **> 40%**. Also, created a service for order entry feed recon with the broker, exchange.
  - Onboarded **Taifex** to a generic tick-to-trade platform accelerated by **FPGA** (HW links).
- Led the development of exchange simulators for **over 30 cash & derivatives markets** across APAC, EMEA, US regions involving trading protocols like FIX4.X, OUCH, ETI, OMEX. Simulators enable trade teams to reliably do strategy backtesting (independent of trading hours) and eliminate exchange session costs **~ 500 USD/day**.
- Created a python library for computing positions (number of contracts & **notional** value) from historical/live trade logs for major **asset classes** - Equities, F/O, Spreads, FX, FI, Cryptocurrency for **position reconciliation**.

### Google Summer of Code

Org Member & Mentor & Student Developer for SymPy

Remote

Feb 2018 - Aug 2019

- Implemented Fast Fourier Transform, Number Theoretic Transform, Walsh Hadamard Transform, Möbius Transform and corresponding convolutions using **efficient algorithms** and **paradigms**.
- Mentored two student projects in **statistics** for compound distributions and stochastic processes.

### Multimodal Digital Media Analysis Lab

Machine Learning Research Intern, IIIT Delhi & National University of Singapore

Delhi, India

Apr 2019 - Jul 2019

- Worked on combining lexicon and word embeddings to detect **hate-speech** on social media platforms (like reddit, twitter) in collaboration with **Bloomberg LP**. Used **LSTM**, **GRU** neural nets with FastText, GloVe as baselines.
- Contributed to FluxML (ML framework in Julia) by adding sample solvers for OpenAI gym problems in **reinforcement learning** based on **Deep Q-Networks**.

## EDUCATION

### Netaji Subhas Institute of Technology, University of Delhi

B.E. (Hons.) in Computer Engineering: CGPA 9.0/10.0 (82.04% with Class I Distinction)

Delhi, India

2015 - 19

### Bal Bharati Public School, Pitampura

12<sup>th</sup> grade (CBSE): 96%; 10<sup>th</sup> grade (CBSE): CGPA 10.0/10.0

Delhi, India

2013 - 15

## PUBLICATIONS

Nagpal, S., et al. 2020. "A Guided Learning Approach for Generative Adversarial Networks". In *2020 International Joint Conference on Neural Networks (IJCNN)*, 1-8. doi:10.1109/IJCNN48605.2020.9206804.

## TECHNICAL SKILLS

**Languages:** C++, Python, Go, Bash, Java, SQL, JavaScript, L<sup>A</sup>T<sub>E</sub>X

**Libraries:** PyTorch, NumPy, Sklearn, pandas, Matplotlib, Jupyter, Selenium, Flask

## POSITIONS OF RESPONSIBILITY

**Mentor, Google Code-in:** Reviewed the contributions by students for Sustainable Computing Research lab. *Fall 2018*

**Delegate, PyCon India:** Organised a developer sprint for SymPy to engage open source contributions. *Fall 2018*

## ACHIEVEMENTS

**Google Code Jam:** Ranked **464 among 25K+** participants in **Round 3 (semi-finals)** of GCJ Competition. *2018*

**Google Kickstart:** Ranked **60 among 800+** participants in **Round B** of Kickstart Competition. *2017*

**ACM-ICPC:** Ranked **26 (Honorable Mention)** in **Asia Regionals** of ACM-ICPC Competition at Amritapuri. *2017*

**Dean's Merit List:** Awarded **Merit Scholarship** for securing a **top 10** position in Computer Eng. Dept. *2016-17*

**Ramanujan Award:** Recognition for **excellent performance** in **Math courses** by Computer Eng. Dept. *2016 2015*

**Kishore Vaigyanik Protsahan Yojana:** Recipient of the **KVPY Fellowship** by Govt. of India. *2015*

**Scholar Platinum Medal:** Recognition for **academic excellence** for **8 consecutive years** in High School. *2008-15*