

# Sidhant Nagpal

sidhantng@gmail.com

+65-9396-3258

github.com/sidhantnagpal

## EXPERIENCE

### Tower Research Capital

Senior Software Engineer, APAC Technical Lead

Singapore

Jun 2019 - present

- Leading the **Asia-Pacific** engineering team delivering **low-latency** access for **algorithmic trading** in equities and derivatives markets spanning Japan, Korea, Taiwan, Australia, Hong Kong, China, Thailand and Singapore.
  - Led the implementation of Japan equities market data system (TSE Flex market-by-order) enabling **\$1bn+** daily trading volume across **10** teams at Tower through successful migration from market-by-price system.
  - Led the implementation of Korea equities & derivatives market data system (KRX NextGen snapshot).
  - Developed the native trading platform for Korea derivatives, equities trading (KRX Etxure+) reducing the order entry latency by  $\sim 40\%$ , leveraging hole-based ARIA encryption and optimised packet sends.
  - Built the native trading platform for Singapore equities (SGX Reach, OMEEx protocol) for efficient order-entry.
- Tech:** C++23, Python, Rust; Socket programming, IPC mechanisms (queues, shared memory), RPC mechanisms, kernel bypass (SF, CX5), packet streaming (SF-X2 for Rx/Tx), FPGA integration for ultra-low tick-to-trade.
- Led the development of exchange simulators for **30+** equities & derivatives markets across **APAC, EMEA, US** regions involving trading protocols like FIX4.X, OUCH, ETI, OMEX. Simulators enabled trade teams to do strategy backtesting reliably (regardless of trading hours) and save on exchange session costs (upto **\$2mn** yearly).
- 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 & 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 (iterative divide and conquer techniques).
- Mentored two student projects focused on compound distributions and stochastic processes in **statistics**.

### Multimodal Digital Media Analysis Lab

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

Delhi, India

Apr 2019 - Jul 2019

- Combined lexicon and **word embeddings** to detect hate-speech on social media platforms (like reddit, twitter) in collaboration with Bloomberg LP. Used LSTM, GRU **neural networks** with FastText, GloVe as baselines.
- Added sample solvers for OpenAI gym problems in **reinforcement learning** using Deep Q-Networks to FluxML.

## 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.

## EDUCATION

### University of Delhi (DU) - Netaji Subhas Institute of Technology

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

Delhi, India

2015 – 19

## TECHNICAL SKILLS

**Programming Languages:** Modern C++ (proficient), Python (proficient), Rust (familiar), Bash

**Tools:** (cpp) clang18, mold, clang-tidy, mamba; (debug) tshark, gdb, valgrind; (py) pytorch, numpy, pandas, matplotlib

## ACHIEVEMENTS

**Google Code Jam:** Secured **98.14%tile** (among 25k+ coders), finishing in round 3 (semi-final) of the contest. *2018*  
**ACM-ICPC:** Ranked **26** (hon'ble mention) in **Asia regionals** of ACM-ICPC competition at Amritapuri, India. *2017*  
**Dean's Merit List:** Awarded **Merit Scholarship** for securing a **top 10** position in Computer Eng. Dept, DU. *2016-17*  
**Ramanujan Award:** Recognition for excellent performance in **Maths** coursework by Computer Eng. Dept, DU. *2016*  
**Joint Entrance Examination:** Secured **99.81%tile** (among 1.3mn+ candidates) in JEE (Main) India. *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*

## POSITIONS OF RESPONSIBILITY

**Presenter, Intuit India Hackathon:** Pitched virtual assistant and NFC solutions for Intuit Mint as an intern. *2018*  
**Delegate, PyCon India:** Organised a developer sprint for SymPy to encourage open source contributions. *Fall 2018*  
**Mentor, Google Code-in:** Reviewed student contributions to Sustainable Computing Research lab project. *Fall 2018*