

Gurmehar Singh

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EDUCATION

B.S., Double-Major in Computer Science and Mathematics
Purdue University

August 2022 – May 2025
West Lafayette, IN

EXPERIENCE

Researcher, Telescope Operator, Software Developer

February 2023 – Present

SETI Institute / Allen Telescope Array (ATA)

Remote

- Using metrics of Gaussianity, eg. skewness and kurtosis, to develop GPU-enabled software to remove incidence of man-made radio interference in astronomical data by **95% at data rates of 90 Gbps**
- Developed services enabling monitoring of critical metrics during observations
- Wrote a scheduler to optimally point telescopes at the sky to complete scans and observations more quickly

Software Engineering Intern

May 2024 – August 2024

SpaceX

Redmond, WA

- Automated configuration changes to the Starlink ground network by monitoring metrics to determine network health, removing need for human oversight during changes and saving **saving ~2 hours per daily operation**
- Automated the process of removing network peers, **saving ~5 hours per week per engineer**
- Drastically reduced security risks by building YubiKey-integrated authentication for a critical service responsible for configuring the Starlink ground network

Software Lead

October 2022 – August 2024

Space & Earth Analogs Research Chapter of Purdue (SEARCH)

West Lafayette, IN

- Led a team of **20 undergrad and grad students** in the NASA SUITS competition to design AR software for the Artemis missions
- Received **\$25000 in department funding** to support project development and team event expenses
- Awarded a NASA Artemis I mission flag, which flew around the moon on the Artemis I mission itself, as a result of our work in the NASA SUITS challenge

Software Engineering Intern

May 2023 – August 2023

SpaceX

Redmond, WA

- Formulated a user forecasting model to incorporate market demand to **inform 6-figure cost hardware decisions** and capacity planning; model **outperformed industry standards (eg. Meta's Prophet)** and in current use by Starlink Ground Network
- Enriched sampled Starlink traffic data to analyze breakdown by geographic location and content distribution network (CDN) while **obfuscating user-specific personal information**
- Created anomaly-resistant metrics to enable cost-efficient planning for ground infrastructure fault tolerance

Volunteer Intern

June 2020 – February 2023

SETI Institute / Allen Telescope Array (ATA)

Remote

- Developed a pipeline to automatically track and label sources of radio interference (eg. satellites) at the ATA
- Developed a data format for observations, created an interface to display objects of observational interests and satellites, migrated software from Python to C for performance
- Co-credited with the Array's first discovery of a Fast Radio Burst

SELECT PAPERS

- Sofia Z. Sheikh et al. *Characterization of the Repeating FRB 20220912A with the Allen Telescope Array*. 2023. arXiv: 2312.07756 [astro-ph.HE]. URL: <https://arxiv.org/abs/2312.07756>
- Ramiro C. Saide et al. "Hycean Exoplanets as Targets for Technosignature Detection: A Case Study of K2-18 b in the 3–10 GHz Band". In: *Research Notes of the AAS* 7.11 (Nov. 2023), p. 233. DOI: 10.3847/2515-5172/ad08b2. URL: <https://dx.doi.org/10.3847/2515-5172/ad08b2>
- Gurmehar Singh et al. *PRASSE – The Pulsar Automated Search Script Ensemble*. 2020. arXiv: 2004.07865 [astro-ph.IM]. URL: <https://arxiv.org/abs/2004.07865>

TECHNICAL ITEMS – LANGUAGES, LIBRARIES, FRAMEWORKS, TOOLS

Python, C/C++, JavaScript, HTML/CSS, Bash, Java, SQL (MySQL, Spark), Scala, PromQL, CUDA, Node.js, NumPy, SciPy, Pandas, Tensorflow, OpenCV / PIL, Flask, Matplotlib, Prometheus, Git, Docker, Google Cloud Platform, AWS, Jupyter, Metabase, Grafana