← Back

```
user@saahas-pc :~$ neofetch --ascii_colors 5 6 4
```

User	Saahas Yechuri
Location	San Francisco, CA
Contact	saahas@gatech.edu | 484-983-4127
Links	github/Suputra | linkedin/saahas | youtube/@saahasY
Bio	Driven engineer working on the boundary between hardware and software. Experienced with designing and building mechatronic and robotic systems, building and scaling data analysis pipelines, and FPGA design. In my free time, I love to read (big fan of hard sci-fi and the future of humanity), bike, and hike!

```
$ grep -A 2 "experience" ~/career.md | less
```

Hardware/Software Engineer @ Zoox

Jan 2022 - Present | Foster City, CA

> Designed and built a **vehicle network emulator** to simulate network traffic on real hardware. Developed **hardware**, **firmware**, and **software** for data collection, emulation, and validation.

> Analyzed **100GB+** of vehicle network data using **Python**; extracted characteristics into '**streamdb**' files that are now used company-wide for data flow analysis and network security investigations.

> Designed a **4-layer passthrough board** to inject errors into **100M/1G automotive Ethernet** lines; matched **BaseT impedance** standards. Uncovered critical issues with missing data and fault detection.

> Optimized network data analysis speed using the **MapReduce paradigm** and designed **data pipelines** for Zoox's compute cluster.

> Utilized skills in **hardware design**, **firmware development**, **software engineering** (Python, C/C++), and **network protocols** to create the '**Network Systems Tester**' (NST) emulator platform.

> Designed Test setups and Test Cases to verify the whole **Time Synchronization** system on Vehicle - including the **Grandleader**, **Boundary Clocks**, and **Endpoints**. This involved creative test setups, **packet analysis**, and experimentation with plotting / data analysis.

> Maintain scripts that verify functionality of **Telecommunications** and **Time Synchronization** on the manufacturing line.

Undergraduate Researcher @ Bio-Robotics Lab

Aug 2022 - Sep 2023 | Atlanta, GA

> Developed **FPGA-based hardware accelerators** for **Homomorphic Encryption** on a **Xilinx Zynq ZC702**, focusing on **key generation**, encryption, and **large integer arithmetic**. Created a novel **key-switching scheme** for faster homomorphic operations.

> Designed and optimized **Verilog modules**, including an implementation of the **Miller-Rabin primality test**, **pseudorandom number generators** based on **LFSRs**, and efficient **modular exponentiators**.

> Interfaced FPGA fabric with **Zynq PS** using **AXI IP cores** and **C code**. Integrated **ADC modules** to process real-world sensor data securely.

> Extensively debugged and validated designs using **Xilinx Vivado's Simulation Suite** and **Integrated Logic Analyzer** (ILA) on both simulated and real hardware.

Student Assistant @ STEM@GTRI

June 2021 - July 2021 | Atlanta, GA

> Mentored **10 Students** in the development of an **autonomous robotic arm** with **computer vision** and high level control.

> Started from basic **Python** lessons, and got all the way to control using **DH-parameters**, **Finite State Machines**, and **Computer Vision**.

> Wrote **25+ example scripts** and **15+ lessons** to help facilitate student understanding of various topics.

> Wrote a **ROS package** to integrate **computer vision**, **inverse kinematics**, and **control** into a simple template stack for the students.

R&D Engineering Intern @ nth Solutions LLC

Feb 2018 - Aug 2019 | Exton, PA

> **3D Modeled** and printed parts for a variety of applications, including product enclosures, accessories, and test rigs. Designed and maintained **25+ 3D printed models**, each with **10+ iterations**.

> Wrote documentation and drew diagrams for **patents**. Experienced with **technical writing** and research.

> Programmed and range tested **ESP8266** and **LoRa** modules to add **IoT functionality** to a pre-existing product.

```
$ skills list --format=compact | bat -p --style=grid
```

```
┌ Programming ──────────┐  ┌ Domain Knowledge ──────┐  ┌ Tools & Software ──────┐
│ Python      [▓▓▓▓▓▓▓▓] E │ Networking & OSI       │  │ Hardware Design        │
│ C           [▓▓▓▓▓▓▓▓] A │ ├─ TCP/IP Stack        │  │ ├─ Vivado/Vitis        │
│ C++         [▓▓▓▓▓▓▓▓] I │ ├─ Ethernet L1-4       │  │ └─ Altium              │
│ Verilog     [▓▓▓▓▓▓▓▓] I │ ├─ PTP/NTP             │  │ Simulation             │
│ CUDA        [▓▓▓▓▓▓▓▓] I │ └─ DDS                 │  │ ├─ MATLAB/Simulink     │
│ Javascript  [▓▓▓▓▓▓▓▓] I │ Robotics & Control     │  │ ├─ GTKWave             │
│ Julia       [▓▓▓▓▓▓▓▓] I │ ├─ IK/FK               │  │ └─ Isaac Lab/Sim       │
│ Scala       [▓▓▓▓▓▓▓▓] I │ ├─ D-H Parameters      │  │ CAD/CAM                │
│ ROS         [▓▓▓▓▓▓▓▓] I │ ├─ PID Control         │  │ ├─ Inventor            │
│ Linux/Unix  [▓▓▓▓▓▓▓▓] A │ └─ RL for Control      │  │ ├─ SolidWorks          │
│ bash        [▓▓▓▓▓▓▓▓] A │ Computer Vision        │  │ └─ Onshape             │
│ bazel       [▓▓▓▓▓▓▓▓] A │ ├─ Calibration         │  └────────────────────────┘
│ OpenCV      [▓▓▓▓▓▓▓▓] I │ ├─ CNNs                │
│ PyTorch     [▓▓▓▓▓▓▓▓] I │ └─ SLAM                │  ┌ Practical Skills ──────┐
│ Polars      [▓▓▓▓▓▓▓▓] A │ Data Processing        │  │ Fabrication            │
│ Matplotlib  [▓▓▓▓▓▓▓▓] E │ ├─ MapReduce           │  │ ├─ 3D Printing (FDM/SLA)│
│ SciPy       [▓▓▓▓▓▓▓▓] I │ └─ Distributed Systems │  │ ├─ Laser Cutting       │
│ NumPy       [▓▓▓▓▓▓▓▓] E │                        │  │ ├─ Wood/Metal shop tools│
└───────────────────────────┘                        │  │ └─ Welding             │
                                                     │  │ Electronics            │
                                                     │  │ ├─ THT/SMT Soldering   │
                                                     │  │ ├─ PCB Assembly        │
                                                     │  │ └─ Test Equipment      │
                                                     │  └────────────────────────┘
```

```
$ tree ~/projects --charset=ascii -L 3
```

```
/projects
|-- FPGA Based Ethernet MAC/PHY
|   `-- description.txt
|       Designed and Tested Verilog modules for a Simple 10BaseT MAC and PHY
|       following IEEE 802.3 to transmit fixed Layer 2 Ethernet packets. Debugged
|       and Tested using Verilator and gtkwave. Working on expanding to Layer 3+
|-- Chess Robot
|   `-- description.txt
|       Using an old 3d printer frame, built a chess robot. Designed motor control
|       circuits, wrote Firmware for low level control, and code for move detection
|       using fiducial markers (AprilTags) and generation. Demo videos on Youtube.
`-- Gyro-Boat
    `-- description.txt
        Built a model boat stabilized by a gyroscope, inspired by Sperry's
        Gyro-Stabilizer. Demo videos on Youtube.
3 directories, 6 files
```

```
$ cat ~/awards | column -t -s ';' | sed '1,2s/./-/g'
```

Awards & Recognition

Year	Award	Organization	Details
2024	**Hack for Social Impact (1st Place)**	UNCCD	Developed "**Arboren**" to help UN analysts visualize and analyze **desertification data**. Presented at **COP 16** in Riyadh.
2023	**SII2024 Conference Paper**	IEEE	**FPGA-based sensor encryption** system paper accepted to **Symposium on System Integration** in Ha Long Bay, Vietnam.
2022	**President's Undergraduate Research Award (PURA)**	Georgia Tech	Funded to do research on **Homomorphic Encryption** with **FPGAs**. Mentored a student on **FPGA development**, and presented findings at a research symposium.
2021	**NASA SpaceApps Best Use of Technology**	NASA	Developed novel **space component separation system**, used **electromagnetic** and **hydraulic** principles to apply a **16kN preload**.
2020	**MIT COVID-19 Challenge Winning Team**	MIT	Created "**COValert**" **SMS chatbot** for rural COVID triage for areas without internet access.

```
$ ssh guest@uspto ls -1 ~/patents | grep -l "Saahas Yechuri" | bat --style=grid
```

File: US-11287348-B2.pdf

Tire Balance Measurement: Apparatus for measuring **imbalance forces** of a **tire/hub assembly** of a vehicle during motion of the vehicle
(Issued Mar 29, 2022)

File: US-10701266-B2.pdf

Video File Reader: Method for reading out contents of a **video file** having a **predefined video file format**
(Issued Jun 30, 2020)

File: US-10469750-B1.pdf

Motion Data Embedding: Method for embedding **motion data** of an object into a **video file** to allow for **synchronized visualization** of the motion data
(Issued Nov 5, 2019)

File: US-10284752-B1.pdf

Video-IMU Synchronization: Method for determining a **start offset** between a **video recording device** and an **inertial measurement unit**
(Issued May 7, 2019)

```
$ cat education.yml
```

```yaml
institution: Georgia Institute of Technology
degree: BS in Mechanical Engineering
gpa: 4.0
coursework:
  - Control of Dynamic Systems
  - Robotics
  - Mechatronics
  - Machine Design
  - System Dynamics
  - Thermal and Fluids Laboratory
  - Experimental Methods
  - Heat Transfer
  - Fluid Mechanics
  - Thermodynamics
  - Numerical Methods
  - Deformable Bodies
  - Dynamics
  - Statics
  - Digital/Analog Circuits
```

```
user@saahas-pc :~$
```