

Shantam Raj

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🐦 RajShantam

Education

Indian Institute of Technology, Guwahati

(August'13 - July'17)

B.Tech in Electronics and Communication Engineering

Interests

Data Science, Data Visualization, Big Data, Artificial Intelligence & Machine Learning, NLP, Design

Experience

Engineer → **Consultant**

(Oct'17 - Aug'20)

Virtusa

- Worked in Research and Development Department, implementing research papers on requirements engineering using **Natural Language Processing** for internal products.
- Developed and given demonstrations of **Machine Learning as a Service**.
- Performed **big data** analysis on **health care** data. Designed and developed REST APIs and microservices.

Intern

(June'15 - July'15)

Netaji Subhas University of Technology

Guide: Dr. Dhananjay V. Gadre

- As part of Texas Instruments University Program worked on the design and development of a portable, low cost oscilloscope using Piccolo Launchpad based on C2000 DSP.

Technical and R&D Projects

Covid Data Visualization Insights

<https://armsp.github.io/covidviz>

(PyData Global Conference 2020)

- Recreated various **interactive charts** - bar, line, ridgeline, choropleth, stream graph, layered and faceted charts - that studied the impacts of Covid-19 pandemic like GDP, health disparities, mobility, emissions, from The NYT and other media houses, in Python using Altair.
- It is the basis of my PyData Global 2020 conference talk.

Template Conformance

<https://github.com/armsp/template-conformance>

- Implementation of the research paper "Automated Checking of Conformance to Requirements Templates Using Natural Language Processing" (Arora, et al. 2015) in Python using Spacy.
- Implemented to be used as an API and identify if requirements adhere to RUPP, EARS or Agile templates.

gific

<https://github.com/armsp/gific>

Creator of a **python** library/framework to access, create, edit, delete **GitHub Gists** from the command line/**bash**.

Active or Passive

https://github.com/armsp/active_or_passive

- Designed a Flask API that served an output stating if the input sentence was in active or passive voice.
- The detection as of now is based on a defined grammar implemented using Spacy.

editorial-agent

<https://github.com/armsp/editorial-agent>

Read The New York Times and The Guardian editorials with complex sentences highlighted. Built using **SpaCy** and **Python**, inspired by **Writing in the Sciences** course by Dr. Kristin Sainani of Stanford University.

Batteryless Node for IoT Sensor Networks

(Nov'16 - Aug'17)

Electronics Lab - Poster Presentation

- CC2650 Bluetooth SoC on a custom PCB was used to develop a network of motes(with ultra low power sensors) that run solely on **super-capacitor** and employ **BQ25570** energy harvesting (ambient light/sunlight) solution.
- Motes work and wake up automatically without human intervention. Designed a highly optimized circuit to **minimize current leakages** - few nanoamperes - and ability to run 24 hours on full charge of just 0.5 farad.
- Programmed CC2650 with a RTOS that handles operations based on energy left in super-capacitor. Negative feedback from BQ25570 helps the ARM Cortex M3 microcontroller decide what sub-systems to turn off.

Open Source Contributions

- **altair-viz** <https://github.com/altair-viz/altair>

Added novel examples, improved documentation, fixed issues, reported multiple bugs and performed extensive testing of the statistical **data visualization** library - Altair.

- **PRESC** <https://github.com/mozilla/PRESC>

Contributing and developing various milestones for **Performance and Robustness Evaluation for Statistical Classifiers** project as part of the Mozilla Working Group for **Trustworthy AI** to be showcased in Mozfest'21.

- **p5.ble.js** <https://itpnyu.github.io/p5ble-website>

Found and **fixed a bug** in transmitting **float32** values to bluetooth devices from **p5** sketch using **Web Bluetooth**. Used nRF52840 SoC to detect the bug. Made a real time sensor data visualizer for browser too.

- **webusb** <https://webusb.github.io/arduino>

WebUSB enables USB devices to be accessed via the web. Extended the library to work out of the box with more hardware development boards and improved the documentation.

- **nano-33-ble-gen** <https://armsp.github.io/nano-33-ble-gen>

Contains a multitude of experiments using Nano 33 BLE (nRF52840 ARM Cortex M4 SoC) like **real time graph plotting** using **web-bluetooth**, **python bluetooth** development, **Madgwick**, **Mahony** filters on IMU etc.

Technical Skills

- **Programming:** Python, C, C++, Javascript, Bash, HTML, CSS, ARM Assembly
- **AI-ML & Data Science:** Scikit-learn, Pandas, Numpy, Altair, Spacy, PySpark, Tensorflow, PyTorch, NLTK
- **Development & CI/CD:** Git, GitHub Actions, Docker, Kubernetes
- **Python Frameworks:** Flask, FastAPI, Jax, Geopandas
- Others: \LaTeX , Google Cloud Platform, Autodesk Eagle, Fusion 360, Arduino, Code Composer Studio

Scholastic Achievements

- Joint Entrance Examination: **Top 1.3%** of the 1.4 million students that appeared nationally
- Junior Science Olympiad: Invited to attend camp at **Homi Bhabha Center for Science Education** (HBCSE) by being one of the **top 35** students all over India.
- **NTSE Scholar:** Recipient of National Talent Search Examination (NTSE) scholarship by NCERT

Positions of Responsibility

Team Lead, Virtusa (May'18 - Dec'18)

Mentor, Electronics Club, IIT Guwahati (Aug'15 - July'17)

- Undertook lectures - Introduction to Electronics and Arduino, **RTOS** Basics - and workshops - **PCB Design** - for the student community.
- Guided, recommended better solutions and taught requisite skills to teams for successful completion their projects.

Extracurriculars

- **Speaker** at **PyData Global 2020** international conference.
- Creator & Editor of **COVID-19 Stories** - a platform for sharing our experiences in the covid pandemic.
- GitHub Arctic Code Vault Contributor
- I am a **published poet**. I write stories and often lend my editorial skills too.
- Selected performer at **Performance Poetry** event, organised by **British Council India**.
- **Winner** of RedBear Lab's **IoT challenge**
- **Quarter-finalist, Hackaday Prize '17** for Batteryless Node for Sensor Networks
- Earned **1652** reputation points, **9 silver** and **21 bronze** badges on StackOverflow