

NAVNEET ANAND SAH

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EXPERIENCE

Software Developer, Research

The Solar Labs

June 2020 – Present New Delhi, India

- Lead a team of 4 interns, while providing guidance and assistance in creating a highly scalable microservices architecture from previously used monolithic architecture that increased responsiveness of the complete system.
- Developed GPU based acceleration using CuPy and reduced the processing time to one-third.
- Implemented upsampling weather data using stochastic models and interpolation.

Software Developer Intern

The Solar Labs

Jan 2020 - May 2020 New Delhi, India

- Worked on modelling solar generation for PV panels using time series weather data for the corresponding location.
- Developed REST APIs using Django for added functionalities.
- Created functional and technical application documents and code refactoring.

Product Design Intern

Ampviv Healthcare Pvt. Ltd.

July 2019 - Dec 2019 New Delhi, India

- Used computer vision techniques for segmentation and classification problems as well as product design for medical imaging applications.
- Worked on embedded systems technologies like BLE, Wifi-Direct, digital signal and image processing along with designing and fabricating 3D printed prototype for various iterations of the product.

Undergraduate Researcher

Wirocomm Labs

Jan 2019 - June 2019 IIIT-Delhi

- Worked on Energy harvesting systems using TEGs (Thermo Electric Generators). TEGs are solid state devices which use temperature difference to produce potential difference (the reverse is also done for refrigeration), without any need of fuel.
- Used LTC 3108 in our system; which is a high-performance power manager and DC-DC step-up converter. It can harvest small power from TEGs, thermal piles, and smaller cells. We were able to harvest 30mW from 1-2 degrees temperature.

SKILLS

- **Python** - Backend Development (Django, Flask), Neural Networks, Machine Learning, Data processing
- **Embedded Systems** - Raspberry Pi, Arduino, Communication protocols, OpenCL
- **MATLAB** - Signal processing, Image processing
- **JAVA** - Android development
- **Others** - AWS, Firebase, SQL, EAGLE, Selenium, Keras, Tensorflow, LabView, LTSpice, LaTeX, C, C++

EDUCATION

B.Tech (ECE) - 7.44 CGPA

Indraprastha Institute of Information Technology Delhi

July 2016 – Aug 2020

CERTIFICATIONS

- Neural Networks and Deep Learning, Coursera
- Sensors and Actuators, NPTEL
- Internet of Things, NPTEL

ACHIEVEMENTS

- **Admin, Electroholics**- Hardware tinkering club at IIITD, where we conduct hackathons and weekly workshops/tutorials on various hardware devices and communication protocols.
- **Publication** - Neha Jain, Navneet Anand Sah, Vivek Ashok Bohara and Anubha Gupta, "Experimental Results for Energy Harvesting by exploiting inherent inadequacies of Sampling process for IoT application" accepted in IEEE International Conference on Communications (ICC), Workshop, 2020.
- **B.Tech thesis** - Reusability of 18650 lithium ion cells: Li-ion cells are used in E-Vehicles due to its power ratio and longer life. This project aims at developing algorithms and tools for measuring the State of Health (SoH) of the cell on the basis of key parameters such as the type of cell, original and existing capacity, temperature calculated over a complete or nominal charge and discharge cycle, its initial and present Internal Impedance and State of Capacity (SoC).

COLLEGE PROJECTS

Secure Banking system for vulnerability testing

- We used Django to create a banking system where a user can log in and transfer an amount to other accounts and keep track of previous transactions. The project was focused on creating a working system while learning about vulnerabilities like XSS, CSRF and SQL injection and trying to exploit systems of other teams.

Speaker recognition on resource constraint devices

- We used Bonsai which is single, shallow, sparse tree with powerful nodes for accurate prediction, for training on voice samples with single word utterances from different speakers. MFCC (Mel-frequency cepstrum) was first extracted from the voice samples and used as a feature vector used for training and prediction.
- The complete trained model had less than 100KB of parameters and was able to achieve 61% accuracy.

Hardware accelerators for Neural Networks

- Using the OpenCL framework, we built a VGG16 CNN (Convolutional Neural Network) for object recognition and RNN (Recurrent Neural Network) for decryption of encoded message to run on heterogeneous environments such as CPUs, GPUs, and FPGAs. OpenCL provides hardware acceleration similar to CUDA, but it can be deployed on non-Nvidia GPUs, making it widely used for edge and fog computing.

Human and Weapon Detection using CCTV cameras

- Used Yolov3, which is a state-of-the-art real-time object detection system. We then used tflite to compress model and deployed it on a Raspberry Pi that was attached to a camera. It collects inferences in real time and is capable of generating occupancy reports and create instant alerts in case of any weapons are detected.

Image Blending using Homography Detection

- We created a project to blend two images into a single image based on the similarity of background. Using computer vision and homography detection techniques, contrast and position of the two images based on their contextual information was matched. We then used that information to blend the two images into a single image.

Pulse Oximeter and Heart rate sensing watch

- We designed and created a wristband with Readbear BLE Nano v2 which is a small form factor BLE enabled development board, and MAX30100 Pulse Oximeter and Heart-Rate Sensor IC that was designed for Wearable Health devices. We measured SPO₂ and heart rate and streamed the data over BLE.

EXTRA-CURRICULAR

- Events Organized -
 - Workshops on IOT.
 - PitchCafe'19 Entrepreneurship Hackathon, IIITD
 - TinkerHack'18 Hardware Hackathon, IIITD
 - Vistara Aviation Hackathon'18, NASSCOM Noida
 - ESYA'18 Cultural Fest, IIITD
 - Jugadathon'17 Innovation Hackathon, IIITD
- 2nd prize in PitchCafe'18 Entrepreneurship Hackathon, IIITD
- Finalist in Rajasthan Hackathon 5.0, Bikaner