Soham Chatterjee

IoT | Machine Learning | Power Systems
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EDUCATION

SRM UNIVERSITY
B. Tech. in Electrical and Electronics Engineering
May 2018 | Chennai, India
CGPA: 8.1

APEEJAY SCHOOL
AISCE: 85% (Physics, Chemistry, Maths)
Grad. May 2014| Kolkata, India

LINKS

LinkedIn:// soham-chatterjee
Github:// soham96
Scholar: Soham Chatterjee
Website: csoham.wordpress.com
Medium: @csoham358

SKILLS

PROGRAMMING LANGUAGES
- Python
- C++
- Java
- Android
- MATLAB
- Go
- JavaScript
- LaTeX

TOOLS/MODULES
- Scikit-learn
- Keras
- TensorFlow
- Pandas
- Matplotlib
- Numpy

MICRO-CONTROLLERS
- Arduino
- Raspberry Pi

DIGITAL SIGNAL PROCESSORS
- Piccolo F28027

ELECTRICAL/HARDWARE
- SCADA
- Power Electronics
- Wireless Power Transfer
- Soldering

EXPERIENCE

SAAMA AI RESEARCH LAB | Research Engineer
June 2018 onwards | Chennai
- Deep Learning research engineer with a special focus on Systems, Deployment and Deep Learning Hardware Optimisations.
- Currently working on adapting neural networks for Quantum Computers.
- Created an OCR system to convert handwritten text in doctor prescriptions to machine encoded text
- Used CNNs to beat the State of the Art in detecting diseases based on a person's DNA Methylation Profiles. arxiv:1807.09617

TESLA LAB, NEXT TECH LAB | Founder and Researcher
March 2016 Onwards | SRM University, Chennai

• Made an IGBT Smart Switch for smart homes that can be controlled with a smart phone and protect devices from surges. Research paper can be found in **EPH Journal** • Developed a model of smart highway that will increase safety, reduce traffic congestion and convert road heat into electricity. • Currently working on improving electrical system of a university building using SCADA. • Developed a system for metered wireless power transfer for Low Voltage Applications

RESEARCH

GALLIUM NITRIDE SEMI-CONDUCTORS | University of Cambridge
Jan 2017
- Using Machine Learning to optimize GaN circuit design by predicting optimum Gate Pulses given other circuit parameters.
- Poster presented at **WiPDA** , which is the world's biggest Power Electronic Conference.
- Project done with the guidance of **Nikita Hari** at University of Cambridge.

DETECTION OF NON-TECHNICAL LOSSES USING ADVANCED METERING INFRASTRUCTURE AND DEEP RECURRENT NEURAL NETWORKS | 17th EEEIC
Jun 2017 | Milan, Italy

•Using LSTM networks to perform Sequence to Sequence Learning to Detect Electricity Power Theft. • Presented at IEEE conference on Industrial and Commercial Power Systems, **EEEIC** held during June 2017 • IEEE Xplore Paper Number - **7977665** (Cited Twice)

HACKATHONS

WINNER | Smart India Hackathon 2016
April 2017 | Ministry of Steel
- Made a Mobile App and an Application in 36 hours that can help detect Electricity Power Theft.
- A user can click a photo of a person stealing power and the Government can then verify it using Machine Learning to check if power was being stolen.
- LSTM's, a kind of Recurrent Neural Networks was used to predict power theft with an accuracy of 74%.

QUARTER FINALIST | Texas Instruments Innovation Challenge
March 2017 | Texas Instruments
- Created an efficient method for online wireless fast charging of electric vehicles.
- Selected for Quaterfinals in the Innovation Challenge

WORK EXPERIENCE

• Volunteer '16: Taught underprivileged children at U&I
• Content Writer '16: At Lenovo DoStore, and various other blogs
• Training '16: Southern Generating Station, CESC
• Wordpress '16: Website for buying and selling second-hand books
• Committee Member: Texas Hold'Em Poker, Aaruush '15

AWARDS

• Winner, "Nation Wants to Know", Milan '16
• Runner Up, Technical Quiz, EleKtra '16
• Runner Up, OOPS Programming, Abhilakshya '13
• Silver Award, Swimming Standard, Singapore, '06

COURSEWORK

• Machine Learning | Stanford: CS229
• Neural Networks by Geoffrey Hinton
• Introduction to Algorithms | MIT 6.006
• Distributed Energy | IEEEx - SmartGrid01.x

AREAS OF EXPERTISE

Internet of Things
Machine Learning
Power Electronics
Android App Development
Power Systems
Swarm Robotics

AREAS OF INTEREST

Machine Learning
Deep Learning
Artificial Intelligence
Quantum Computing

COMMUNITIES

Intel Software Innovator
IoT For All
WiMLDS Chennai

TALKS

PyCon MY 2018
PySangamam 2018

PROJECTS

MACHINE LEARNING

GAN TRANSIENTS PREDICTION | June 2017

• Made a Feed Forward Neural Network to perform regression to predict transients in GaN switches.
• Used Numpy, Pandas, Keras, Matplotlib.

ELECTRICITY POWER THEFT PREDICTION | Mar 2017

• Made an LSTM Network to perform classification to predict anomalies in household electricity power usages.

ELECTRICAL

DYNAMIC WIRELESS CHARGING OF ELECTRIC VEHICLES | Mar 2017

• Wireless Power System for Charging Electric Vehicles while they are moving on the road.
•Reduces the need for charging stations and heavy charging equipments

HIGH POWER, HIGH FREQUENCY INVERTER | Feb 2017

• Made a 100 W High Frequency Inverter for a Wireless Power Transfer Project.
•It was tested for a frequency of 12 KHz
•A TMS320C28027F Digital Signal Processor by Texas Instrument was used to give the PWM pulse for the inverter.

IOT

GO SWITCH | Aug 2016

• Created a Novel IGBT Smart Switch for Smart Homes that can be used to switch ON or OFF any home appliance using your Smartphone.
•The Smartphone app can keep a track of the Voltage, Current and the Power consumed by each of your appliances.
•The Switch also has protective functions, which will make MCB's obsolete in the future.The Switch also has protective functions, which will make MCB's obsolete in the future.

ANDROID APP DEV

EEEA APP | Sept 2016

• Made an Android app that can be used by the college professors to send notifications to students and upload notes.

VIDYUT APP | Mar 2017

• Made an Android app that can be used by the college professors to send notifications to students and upload notes.
• The app was used as apart of the project that won the First Prize at the Smart India Hackathon, 2017

OPEN SOURCE CONTRIBUTIONS

ROSTER | Nov 2018

• A GPU scheduler that can dynamically schedule training tasks to GPUs.
• Roster will start the training of another neural network as soon as the training of the current one has stopped.
• You can also dynamically change the training queue by adding more important training jobs to the front of the queue.

CHUM | Nov 2017

• It is a data pre-processing and data augmenting pipeline that makes doing repeated tasks simpler and helps you concentrate on the task of training the network.