

# Soham Chatterjee

IoT | Machine Learning | Power Systems  
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## EDUCATION

### SRM UNIVERSITY

B. TECH. IN ELECTRICAL AND ELECTRONICS ENGINEERING  
Expected June 2018 | Chennai, India  
CGPA: 8.00 as of 6th Sem

### APEEJAY SCHOOL

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

## LINKS

LinkedIn:// soham-chatterjee  
Github:// soham96  
Website: csoham.wordpress.com

## SKILLS

### PROGRAMMING LANGUAGES

- Python
- C++
- Java
- Android
- MATLAB
- HTML5
- CSS
- JavaScript
- LaTeX

### TOOLS/MODULES

- Sklearn
- Android Studio
- Keras
- TensorFlow
- Pandas
- Matplotlib

### MICRO-CONTROLLERS

- Arduino
- Raspberry Pi

### DIGITAL SIGNAL PROCESSORS

- Piccolo F28027

### ELECTRICAL

- SCADA
- Power Electronics
- Wireless Power Transfer

## EXPERIENCE

### INDIAN STATISTICAL INSTITUTE | RESEARCH INTERN

Nov 2016 to Jan 2017 | Kolkata

- Worked with Prof. Krishnendu Mukhopadhyay as a Swarm Intelligence Algorithms researcher.
- Making new algorithms for gathering of oblivious, asynchronous Fat robots with limited visibility.
- Currently working on implementing theoretical models in physical swarms.

### 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

### DETECTION OF NON-TECHNICAL LOSSES USING ADVANCED METERING INFRASTRUCTURE AND INTELLIGENT ALGORITHM ENSEMBLES | 17TH IEEE

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, IEEEIC held during June 2017

### GALLIUM NITRIDE SEMI-CONDUCTORS | UNIVERSITY OF CAMBRIDGE

Jan 2017

- Using Machine Learning to optimize of GaN circuit design
- Project done with the guidance of **Nikita Hari** at University of Cambridge

## 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 Quarterfinals 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 | IEEEEx - Smart-Grid01.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  
Gallium Nitride Semiconductors

## 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.
- Used Numpy, Pandas, Keras, Matplotlib.

### 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

#### EEEE 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