ADIL GUPTA

+81-70-8346-0675

adilgupta214@gmail.com ⬦ *LinkedIn* ⬦ *Github* ⬦ *Webpage*

EDUCATION

Indian Institute of Technology, Bombay   *July 2016 - August 2020*
B.Tech in Electrical Engineering   Overall GPA: 8.88/10

WORK EXPERIENCE

Honda Innovation Lab   Dec 2020 - Present
Connected Strategy Planning and Development Devision   *Tokyo, Japan*

· Researched and developed deep reinforcement learning based methods for various applications to enrich the mobility experience of Honda Customers
· Exact projects and figures are not mentioned to honor the non-disclosure agreement

INTERNSHIP EXPERIENCE

Audio Technology Department, Sony   May 2019 - July 2019
Guide: Kyosuke Matsumoto-san   *Tokyo, Japan*

· Researched and developed **very low latency speech enhancement** methods using **deep learning**
· Researched new methods to **model musical noise** and reduce implementation time of proposed method
· Extended the proposed method to applications using **microphone arrays**, developed a deep learning based **beamforming** algorithm to be used in combination with proposed real time speech enhancement network
· Proposed a method to identify optimal locations of microphones on the device under consideration
· Description is high level, exact devices and figures are not mentioned to honor the non-disclosure agreement

Data Science Department, Balbix   May 2018 - July 2018
Guide: Dr. Pavan Ramkumar   *San Jose, California*

· Developed a probabilistic method to get impacts of breach in network through its individual devices by combining traffic observations and prior device information such as role, category, applications running, etc.
· Designed and implemented a **Probabilistic Graphical Model** for obtaining **device impacts** using **Pyro**, a scalable deep probabilistic programming library **open sourced by Uber**
· Extended the method to calculate **confidence levels** of impacts based on amount of data recorded for each device modeled using **fully Bayesian inference** with cutting edge deep learning framework

PROJECTS

Speech Enhancement for Automatic Reading Assessment   July 2019 - Dec 2019
Prof. Preeti Rao   *Thesis*

· Researched on **speech enhancement** algorithms for improvement in children's oral reading assessment
· The enhanced recordings are to be automatically rated for reading fluency using **ASR** and **prosody detection**
· Focused on developing deep learning based methods that **preserve the speech characteristics** like pitch which are usually distorted by conventional enhancement methods and are crucial for prosody assessment task

Secure Voice Communication System   March 2019 - April 2019
Prof. Vikram M. Gadre   *Digital Signal Processing*

· Conceived a secure low-resource voice communication system for narrowband military applications
· Achieved **85% speech compression** using methods like Linear Predictive Coding and pitch detection
· Performed encryption using chaotic signal obtained by solving Rssler discrete-time hyper chaotic system

· Selected among the **top 5** projects out of **35+ teams** in TI-DSP seminar, supported by the MHRD

High Speed Polymer Optical Fiber Link
Prof. Kumar Appaiah

January 2019 - April 2019

Electronics Design Lab

· Built a cost-efficient laser-based optical fiber communication link delivering data speeds of about **50 Mbps** for **100m Polymer Optical Fiber (POF) link** with potential use in FTTH (Fiber to the Home) networks
· Designed 3D-printed connectors using Solidworks for efficient coupling of laser, POF link and photodiode
· Implemented in three stages (achieved speeds up to **1.5/12.5/50 Mbps**), designed PCBs at each step for noise minimisation and examined the problems faced in designing circuits operating at such high frequencies

Processor Design
Prof. Virendra Singh

September 2018 - November 2018

Microprocessors

· Designed and implemented **16-Bit, 6-Stage Pipelined RISC** processor with **8-registers** based on Turing-Complete ISA in **VHDL**; successfully tested the implementation on **Cyclone IV FPGA Board**
· Optimized performance of the processor through **data & control hazard mitigation**, **result forwarding**

Google Landmark Recognition Challenge
Prof. Preethi Jyothi

January 2018 - April 2018

Foundations of Machine Learning

· Explored the problem of recognizing correct landmark in dataset of test images from label set of **15,000+**
· Implemented **15 layer** Convolutional Neural Network using **TensorFlow**; trained it on **Google Cloud**

Encrypted Audio Transmission Using Chaotic Circuits
Prof. Siddarth Tallur

April 2018

Analog Circuits

· Built and analyzed a **chaotic circuit** for **encrypting audio signals**, and built a corresponding chaotic decryption circuit to **extract the transmitted audio signal** with minimal distortion
· Recorded audio using **microphone** and **encrypted** it with noise created by **chaotic oscillator**
· Simulated the **3rd order chaotic oscillators** in **Ngspice** and implemented it using TL 7802 Opamps

Reaction Game On CPLD Board
Prof. Madhav P. Desai

April 2018

Digital Circuits

· Designed a game using **VHDL** to measure **reaction time**, having application in **clinical diagnostics**
· Conceptualised an **RTL machine** to display response time to an LED glowing at random instants on LCD
· Implemented the specification of the game on **Krypton CPLD** Board (**Altera MAX V** architecture) using **Quartus Prime** Software and verified the design by conducting simulations on **ModelSim**

Automatic Toll Collection System

May 2017

· Created **Arduino programme** to communicate with **RFID sensors** on road to automate toll collection
· Developed **monitoring system** for capturing sensor data & maintaining collection systems using **Pyserial**

Crypto Package using RSA Algorithms
Prof. Bernard Menzes

October 2016

Computer Programming

· Designed a **cryptopackage** based on **RSA algorithms** using **C++**
· Executed **Pohlig-Hellman** and **Baby Step Giant Step algorithm** to compute **discrete logarithm**
· Programmed an RSA cryptosystem for **RSA key generation, RSA encryption and decryption**

TEACHING EXPERIENCE

MA105 - Calculus
Teaching Assistant

July 2018 - November 2018

IIT Bombay

· Entrusted with conducting weekly tutorial session for **50 students** to help them with the concepts of **calculus**

· Helped the professors in **conducting examinations** and evaluating the answer scripts

RELEVANT COURSES

- **Electrical engineering** - Speech Processing, Signals & Systems, Digital Signal Processing, Communication Systems, Digital Communications, Microprocessors, Control Systems, Network Theory
- **Mathematics** - Multivariable Calculus, Linear Algebra, Differential Equations, Complex Analysis
- **Computer Science and Data Analysis** - Medical Image Computing, Data Analysis and Interpretation, Probability and Random Processes, Foundations of Machine Learning, Network Security and Cryptography, Advanced concentration inequalities

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 116** out of 2,00,000 applicants in JEE Advanced 2016
- Placed in the **99.60th percentile** in JEE Mains 2016 out of 12,00,000 candidates
- Among **Top 1%** at state level in National Standard Examination in Physics(**NSEP**)
- Within **Top 1%** at state level in National Standard Examination in Chemistry(**NSEC**)
- Selected for the Kishore Vaigyanik Protsahan Yojana Award 15 (1000 out of 20000 applicants)

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, Java, SQL, Julia, VHDL, HTML, CSS, MATLAB
Software & Tools	Git, Docker, Quartus, AutoCAD, Solidworks, Arduino, NGSpice
Machine Learning	Tensorflow, PyTorch, NumPy, OpenCV, Pyro, Pandas, Anaconda

EXTRA-CIRRUCULAR

Strategic Decision Modelling Course

- Completed course Behavioural Insights to Strategic Decision Modelling at **London School of Economics**
- Learned about decision making in fields like marketing, strategic planning, resource allocation & investment

Volunteer at National Service Scheme

- Successfully completed **80+ hours** of community service as part of **NSS, Green Campus**
- Made videos in **regional Indian Languages** to promote the use of medicinal plants
- Carried out a tree census along the **1.6 km** long main road and recorded a total of 200 trees of **40 species**

Miscellaneous

- Certified as **stage 1 sky diver** by iFLY indoor sky diving, Basingstoke and learnt the sport of **wakeboarding**
- Won **Fourth position all over India** in green I competition held at Hyderabad international Convention Centre organized by the Confederation of Indian Industrys Young Indians
- Successfully completed a fast track course on **mock parliament** held at IT festival, DPS RK Puram

REFERENCES

Pavan Ramkumar	**Kyosuke Matsumoto**
Research Engineer	Research Engineer
Data Science Department, Balbix	Audio Technology Department, Sony
webpage ◇ *email*	*email*

Kumar Appaiah
Assistant Professor
Electrical Engineering, IIT Bombay
webpage ◇ *email*