Manpa Barman

Portfolio: reboreexplore.github.io
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Education

- **Assam Engineering College** — Assam, India
  Bachelor of Engineering - Instrumentation Engineering; Percentage: 85.6 — *July 2016 - Sept 2020*
  - **Rank**: **1st** in the Department of Instrumentation Engineering and in the top **2%** in the entire undergraduate degree course programme.
  - **Relevant Courses**: Digital Systems, Control Systems, Embedded Systems, Microprocessors and Microcontrollers, Digital Image Processing, Biomedical Instrumentation, Signal Processing, Optimization Techniques, Linear Algebra, Multivariate Calculus, Probability and Statistics.
- **Don Bosco Senior Secondary School** — Assam, India
  Higher Secondary Education(CBSE)- Science; Percentage: 90.2 — *July 2014 - May 2016*
  - **Subjects Taken**: Physics, Chemistry, Maths, Computer Science, Physical Education and English
- **Modern English School, Kahilipara** — Assam, India
  Matriculation(CBSE); Grade: 10 CGPA — *May 2001 - May 2014*
  - **Activities and Extra Curricula**: School representative for the CBSE Inter School Technical Festival, Head editor for the Assamese Department in the final year.

Skills Summary

- **Languages**: Python, C++, C, Java
- **Frameworks**: Scikit, Pandas, Numpy, Jax, TensorFlow, Keras, Pytorch, Flask, Matplotlib
- **Softwares**: LTSpice, STMCube, LabVIEW, MATLAB
- **Platforms**: Linux, Web, Windows, Arduino, Raspberry Pi, STM32
- **Soft Skills**: Leadership, Public Speaking, Event Management, Technical Writing

Internships and Experiences

- **Indian Institute of Technology, Guwahati** — Guwahati, Assam
  Research Intern (Full-time) — *Dec 2020 - Dec 2021*
  - **Supervisor**: Prof. Manas Kamal Bhuyan and Mr. H. Pallab Dutta
  - **Overview**: Investigated the state-of-the-art methods of hand pose estimation through intensive literature survey on the evolution of the deep learning architectures in pose estimation problems.
  - **Implementation**: A robust and generalized end-to-end architecture to estimate the hand pose in a 2D RGB input image. It was trained using an open-source synthetic hand dataset.
- **Assam Engineering College** — Guwahati, Assam
  Teaching Assistant (Full-time) — *Feb 2021 - April 2021*
  - **Supervisor**: Prof. Nutan Kumari Singh
  - **Overview**: Taught Physics (Quantum Mechanics) and Mathematics (Linear Algebra and Differential Equations) to the first year students.
- **University of Warwick, United Kingdom** — United Kingdom
  Research Intern (Full time) — *Feb 2020 - March 2020*
  - **Supervisor**: Prof. Layi Alatise and Prof. Jose Ortiz Gonzalez
  - **Overview**: Developed a test setup for evaluation of the SiC power MOSFETs in LabVIEW. A detailed analysis of the current, voltage and temperature constraints of the SiC MOSFET was conducted using the developed LabVIEW model.
- **Indian Oil Corporation Limited, Guwahati** — Guwahati, Assam
  Summer Trainee (Full time) — *July 2019 - August 2019*
  - **Department**: Instrumentation Engineering
  - **Overview**: Analyzed the various instruments and measurements techniques used in the oil and gas industry, and studied the extensively used measurement setups. The five industry units covered during our visits are Workshop, Crude Distillation Unit, Motor Spirit Quality Unit, Delayed Coking Unit and Thermal Power Station.
- **Assam Engineering College** — Guwahati, Assam
  Undergraduate Thesis — *July 2019 - August 2020*
  - **Supervisor**: Mr. Rhittwikraj Moudgollya
  - **Overview**: Designed a robust, inexpensive and portable surveillance system capable of real time monitoring and inference.
  - **Implementation**: Conventional Image Processing and Deep Learning Object Recognition and Detection models were tested on Raspberry Pi 3B+ model and NVIDIA Jetson Nano to investigate the most effective and lightweight prototype.

Projects

- **Hand Segmentation on Cross Dataset**: An end-to-end architecture for detection and segmentation of hand images under illumination variance taken in a laboratory setup and tested in a diverse dataset achieving considerable accuracy.
- **DCGAN Implementation**: Created an open-source implementation of the Deep Convolutional Generative Adversarial Network paper by A. Radford et. al. in the pytorch framework. The model was benchmarked on the Flower17 dataset.
- **Design Analysis of Instrumentation Amplifier using eSim**: Modelled an Instrumentation Amplifier from several research articles to measure small scale medical signals and efficiently derive those for further studies).
- **Pygame projects**: Created a two player implementation of tic-tac-toe and car racing game using the pygame framework. This also includes a simplistic AI based on the minimax algorithm.
- **Research Paper Implementations**: Implementation of state-of-the-art deep learning research papers using Tensorflow Framework viz. Very deep convolutional networks for large-scale image recognition, A Neural Algorithm of Artistic Style, Generative Adversarial Network, etc.

Publications

Object Detection and Tracking Turret based on Cascade Classifiers and Single Shot Detectors

P. Gogoi, M. Barman, M. Deka, U. Rajkonwar, R. Moudgollya

IEEE International Conference on Computational Performance Evaluation (ComPE), 2020
DOI:10.1109/ComPE49325.2020.9200139

Honors and Awards

- Awarded a fully funded **merit scholarship** from the **Government of Assam** as a part of the Winter Overseas Fellowship Program - 2020 to pursue a research internship in the **University of Warwick**.
- Achieved top **5%** rank in the National Programme on Technology Enhanced Learning (NPTEL) "Microprocessors and Microcontrollers" certification exam and received college memento for the same (2019).
- Recipient of Merit Award cum scholarship from AEC Alumni Association for the year 2018, 2019 and 2020 for scoring the highest marks in the semester examinations.
- Recipient of North Eastern Council Merit Grant from the Directorate of Technical Education, Assam for the four years of the undergraduate degree course.

Certifications/Events

- **National Programme on Technology Enhanced Learning (NPTEL) Certifications**: Passed certification examinations on Digital Circuits, Microprocessors and Micro controllers, Biostatistics and Hardware Modelling using Verilog to enhance my domain knowledge.
- **CVIT Summer School on Artificial Intelligence, IIIT Hyderabad**: Selected to attend a month long Summer School on Representational Learning which had a number of lecture series from renowned personalities in the field of AI.
- **Deep Learning Specialization - deeplearning.ai**: Undertook five courses incl. assessments on deep learning basics covering topics like CNNs, RNNs, Hyperparameter Tuning, etc., via Coursera.
- **AI for Healthcare Specialization - deeplearning.ai**: Undertook three courses to understand the complications and measures of deploying AI techniques for Medical Diagnosis, Prognosis and Treatment via Coursera.
- **Open Source Contributor**: Contributed to several small scale open source projects as a part of Hacktoberfest in the year 2021 and 2019.
- **Kaggle Competitions**: Took part in various kaggle competitions viz. Catheter and Line Position Challenge with my team and achieved top 10% ranking in the Plant Pathology competition '21.

Clubs and Extra-Curriculars

- **Student Mentor**: Served as a Student mentor in the JAM (Music) Club and Robotics Club for the session 2019-20 and organized tutoring sessions and competitions as a part of club activity.
- **Chairperson, Indian Society of Technical Education, AEC Chapter**: Supervised an online and offline technical fest, Techxom 2020 that saw participation from over 500 engineering students from the North-eastern region of India (Jan 2019).
- **Official Vocalist of Assam Science and Technology University Anthem**: Selected as the official vocalist for the university anthem and recorded the official track in April 2021.
- **Senior Diploma Holder - Fine Arts**: Obtained the Senior Diploma in Fine Arts from Rupvarnam Fine Arts Society with Distinction in the year 2015.
- **Junior Diploma Holder - Indian Classical Music**: Obtained the Junior Diploma in Indian Classical Music from Bhatkhande Gharana in the year 2013.