

Deepayan Bardhan

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EDUCATION

North Carolina State University, Raleigh, NC May 2020
Master of Science, Electrical and Computer Engineering GPA – 3.815/4
Coursework: Design and Analysis of Algorithms & Data Structures | Computer Vision |
Digital Imaging Systems | Neural Networks | Pattern Recognition | Random Processes |
Object Orientated Design & Dev | Computer Networks | Digital Signal Processing

Indian Institute of Engineering Science and Technology, Kolkata, India April 2018
Bachelor of Technology, Electrical Engineering GPA - 8.51/10
Coursework: Data Base Management System | Artificial Intelligence | Digital Electronics

TECHNICAL SKILLS

Languages: Python, C++, Java, MATLAB, Ruby, Ruby on Rails
Python Tools: NumPy, Pandas, Scikit-Learn, SciPy, Flask, Tkinter, SLAM, ROS
Machine Learning Frameworks: OpenCV, PyTorch, Tensorflow, Keras
Statistical Tools: JMP(SAS), R
Data Visualization: Matplotlib, Seaborn, Tableau, PowerBI, ggplot
Database Querying Language: SQL
Operating System: Windows, Linux
Tools: Jupyter, Spyder, VS Code, Github, MS Excel

Member of [IoT Lab](#) of NCSU

ACADEMIC PROJECTS

Data Science Projects:

Titanic Survival Prediction

- Analyzed and Feature engineered the Titanic dataset
- Used Machine Learning classifiers like Random Forest, Decision Tree, SVM, Perceptron model, and KNN to predict the survival chances of passengers in the Titanic.
- Achieved best performance using Random Forest through hyper-parameter tuning
- [Titanic Survival Prediction - Source Code](#)

Time series Demand Forecasting

- Forecasted hourly electric energy consumption for NY-ISO over a 2-weeks period
- Used an ARIMA model along with multivariate linear regression model trained over 3 years of energy and weather data.
- A prediction accuracy of close to 90% was achieved compared to the actual results

Hand Written Digit Recognition Live

- Built a convolution neural network model to classify the millions of handwritten digits
- Used image processing techniques such as line detector and edge detection to extract the digits
- Used Keras models to classify the digits after closely analyzing various features.
- Achieved an accuracy of 99.4 % on the famous MNIST dataset.
- [Hand Written Digit Classification - Source Code](#)

Event Timeline Detection

- Manufactured a model that understood cause and effect relation between 2 sentences
- Quantified performance of SVM and Random Forest supervised learning algorithms in detecting casualties between event pairs for NLP word embedding techniques (word2vec)
- [Event Timeline Detection - Source Code](#)

Body Rocking Behavior Recognition

- Aimed at identifying disease based on sensors values detecting body rocking behavior.
- Inertial measurements from wearable sensors were recorded from a blind subject which were processed through CNN and CNN+LSTM based model and was used for determining the state of the subject under consideration
- Accuracy improved from 63 % to 80% using CNN + LSTM modelling.

Automatic Vetting System

- Built an automatic vetting system using Amazon Web Services (AWS).
- Collected information from Alexa using Amazon Polly and Amazon Transcribe and integrated with Microsoft Azure Chatbot service to automate the process which was used for security testing purposes (ad generation).

Built a library database system with MVC architecture using RoR

- Built a database system for library from scratch using Ruby on Rails (RoR) with OOPs concept.
- Used Model-View-Controller architecture for the design of the library database
- Used AGILE process and SCRUM framework for development for the database.
- [Library Management - Deployment](#)

Demonstration of Li-Fi

- Used a led source to play a music on a speaker from laptop using the concept of light fidelity without there being any direct physical contact of the computer to speaker.

Computer Vision Projects:

Counting lane changes by cars

- Used PyTorch built neural network model to find the total number of cars changing lanes from a provided GoPro and Drone feed
- Used Convolution Neural Network (CNN) model to detect cars and separate shadows from them
- Compared the performance with an industrial software (Camlytics) and achieved better performance by 8%

Pattern Recognition Using Mixture Models

- Separated Textures in an image using EM algorithm with mixture of Gaussian models.
- Generated data through Prague Texture Segmentation Data Generator
- [Texture Segmentation - Source Code](#)

2D model depth estimation

- Aimed at classifying foranifera images into certain types using 2D images
- Built an auto-encoder model to generate 2D depth images with depth information from detailed 2D images
- Generated the training set to train the auto-encoder model, involving 2D images and their corresponding depth images

ACHIEVEMENTS

Ranked 1st in ACM-ICPC (Association for Computing Machinery – International Collegiate Programming Contest) 2016-17 from College and 275th rank holder in India finals, organized at Kerala, India.

‘Robo-soccer’ runners up at Indian Institute of Technology (IIT) Kharagpur, an image processing-based soccer match played by programmable bots for the movements after processing of the bird’s eye view image feed provided by a camera.

RESEARCH PUBLICATION

Bardhan D. “Fashion recommendation system: A systematic literature review on principles, methods and performance evaluation” IEEE journal – under evaluation