Yajnavalkya Bandyopadhyay

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Research Interests

- Image Processing, Computer Vision, Urban Spatial Analysis, Geostatistics, Hydrology, IoT, Optimization, ANN, CNN, Time Series Analysis

Professional Profile

Firm	Role	Duration
Debahuti Tech Pvt. Ltd.	Principal Engineer	June 2022 – Present
Indian Institute of Technology, Roorkee	Project Associate	Feb 2023-April 2023
Agnyshala Makerlabs	Software Architect	Feb 2020 - Jul 2020
Rigvaimaniki Technologies Pvt. Ltd	Junior Software Developer	Aug 2019 - Jan 2020
Malaviya National Institute of Technology	Summer Research Intern	July 2017 - Aug 2017
Friends of Kolkata's Elderly	Web Developer Intern	Dec 2016 - April 2017

Academic Profile

Degree	Institute	Year
Certificate Course in AI and Deep Learning	Indian Institute of Technology, Roorkee	2024
M.Tech(Remote Sensing)	Birla Institute of Technology, Mesra	2020-2022
B.Tech(Civil Engineering)	Techno India College of Technology	2014-2018

Technical Skills

- *Computer Languages* – C, Java, Python, Javascript
- *Libraries* – Scikit Learn, Tensorflow, Keras, Seaborn, OpenCV, CUDA, Google Earth Engine
- *Softwares* – QGIS, Autodesk AutoCAD, Rhinoceros 3D, STAAD Pro, MATLAB, ArcGIS, Erdas Imagine, ENVI

- *Devices* – Arduino, ESP32, ESP8266, Raspberry Pi Pico, Raspberry Pi 4B, Cubieboard Cubietruck

Books Authored

1. Bandyopadhyay, Y.,2024, **Introduction to Machine Learning**, ISBN - 978-93-341-2915-1
2. Bandyopadhyay, Y.,2024, **Introduction to Digital Image Processing**, ISBN - 979-8327368224
3. Bandyopadhyay, Y.,2024, **Introduction to Remote Sensing**, ISBN – 978-9334083163

Journal Publications

1. Bandyopadhyay, Y., 2015. **Glass Defect Detection and Sorting Using Computational Image Processing.** *International Journal of Emerging Technologies and Innovative Research*, *2*, pp.73-75.
2. Bandyopadhyay, Yajnavalkya, **Determination of Physical Quality of Rice Using Image Processing** (August 1, 2016). International Journal of Emerging Technologies and Innovative Research, ISSN:2349-5162, Vol.3, Issue 8, page no. pp70-72.
3. Bandyopadhyay Y, Chowdhury TM (2021) "**Predicting BitCoin Price Using Deep Learning."** J Comput Eng Inf Technol 10:8

Conference Publications

1. Parthiba Chakraborty, Yajnavalkya Bandyopadhyay and Anuva Chowdhury, **"Mapping the water vulnerability in Peri-Urban areas of Bhubaneshwar using Remote Sensing Indices"**
   Conference – 3rd International Conference on Recent Developments in Sustainable Infrastructure, 2023
2. Yajnavalkya Bandyopadhyay, Parthiba Chakraborty and Anuva Chowdhury, **"A study and trend analysis of environmental air pollution changes in Bhubaneshwar with reference to its Peri-Urban area"** Conference – 3rd International Conference on Recent Developments in Sustainable Infrastructure, 2023
3. Bandyopadhyay, Yajnavalkya and Roy, Sandip and Chatterjee, Siddhartha, "**Predicting Stock Market Prices Using Deep Learning by Tensor Flow"** (February 15, 2019). Lecture Notes in Networks and Systems (LNSS, volume - 41), ISBN - 978-981-13-3122-0, Springer, 2019 Conference – ETES 2018 at Asansol Engineering College, 2018
4. Yajnavalkya Bandyopadhyay, Barun Das, "**Comparative Study of an Integrated Supply Chain by NSGA-II and ACO"**
   Conference - 3rd Regional Science & Technology Congress, 2018
5. Yajnavalkya Bandyopadhyay, Sanat Kr. Mahato, "**An application of Pentagonal Fuzzy Numbers in Reliability Redundancy Allocation Problem using Genetic Algorithm"** Conference - 3rd Regional Science & Technology Congress, 2018

Pre-Prints

1. Bandyopadhyay, Yajnavalkya. "**Lunar Crater Detection Using YOLOv8 Deep Learning.**" (2024). EarthArXiv, DOI - https://doi.org/10.31223/X5J69V
2. Yajnavalkya Bandyopadhyay, Barun Das. "**Comparison of A Fuzzy Supply Chain Model with learning effect using Evolutionary Algorithms"**. *Authorea.* December 01, 2023. DOI: 10.22541/au.170147003.39178826/v1
3. Bandyopadhyay, Yajnavalkya and Patel, Nilanchal, "**Time Series Analysis of terrain and climatic parameters data retrieved from Terraclimate dataset: A case study in Ranchi and Khunti district, Jharkhand, India**", EarthArXiv DOI - https://doi.org/10.31223/X5NH27

Copyrights

1. Yajnavalkya Bandyopadhyay, "**Software to detect Water Bodies in satellite images using Deep Learning**", Indian Copyright **SW-17796/2023**(December 2023)
2. Yajnavalkya Bandyopadhyay, "**Software to detect and classify the type of Tumors from MRI images using Convolution Neural Networks and Deep Learning**", Indian Copyright, **SW-17810/2023** (December 2023)
3. Yajnavalkya Bandyopadhyay, "**Software to Mask Settlements in UAV or Satellite Images using Deep Learning**" Indian Copyright, **SW-17942/2023** (December 2023)
4. Yajnavalkya Bandyopadhyay, "**Software to detect and segment Breast Tumors using Ultrasound Images and Deep Learning**", Indian Copyright, **SW-18163/2024**
5. Yajnavalkya Bandyopadhyay, "**Software to detect Ocular Disease from Colour Fundus Photography using Deep Learning**", Indian Copyright, **SW-18228/2024** (January, 2024)
6. Yajnavalkya Bandyopadhyay, Somnath Majumder "**Software to develop engineered drawings and computational results for the construction of Gantry Girder and Plate Girders.",** Indian Copyright, **SW-18468/2024**(March, 2024)
7. Yajnavalkya Bandyopadhyay **"Geospatial Image exporter in batch for Google Earth Engine data Catalogue"** Indian Copyright, **SW-18510/2024**(March, 2024)
8. Yajnavalkya Bandyopadhyay "**Software to export spatial pixel-wise data over time series from Google Earth Engine Data Catalogue"** Indian Copyright, **SW-18458/2024**(March, 2024)
9. Yajnavalkya Bandyopadhyay **"Software to evaluate residential connectivity to utilities using a geospatial approach",** Indian Copyright, **SW-18710/2024**(May 2024)
10. **Bone Marrow biopsy cell classification using Convolutional Neural Networks**, Indian Copyright, **SW-19127/2024**(June 2024)
11. **Semantic Segmentation of Building Footprints from Satellite Images using Convolutional Neural Networks,** Indian Copyright, **SW-19074/2024**(June 2024)

Research Projects

- **AI and Web Application based Romantic Poet**
  (August 2024)
  Based on TypeScript, NodeJS and LLM to build a web service-based app which generates romantic poems and love letters and mails them to the subscriber list every day at a specific

*time***.**

- **Deep Learning based Flood Water Segmentation model**
  (Project at Debahuti Tech, June 2023 to September 2023)

  The project involves Deep Learning technique UNET-RESNET for segmentation of Flood water from images captured by drones with an accuracy of 92.23%)

- **Low-cost ECG system with Deep learning diagnostic system based on ATmega328 and ESP32 chipset**
  (Project at Debahuti Tech, October 2022 to March 2023)

  The whole project cost 800 rupees and the diagnostic system is 97.2% accurate. Requires an Android-based mobile phone for monitoring and diagnostic system to work.

- **Indoor Low-cost Air Pollution Monitoring IoT enabled device**
  (Project at Debahuti Tech, June to September 2022)

  Microcontroller and sensor-based device to monitor air pollution with WiFi and BLE-enabled web-monitoring system.

- **Time Series Analysis of Climatic and Terrain Data retrieved from TerraClimate Dataset [A case study on Ranchi and Khunti District of Jharkhand, India]**
  (Guide: Dr. Nilanchal Patel, Professor, BIT Mesra)

  Time Series and Trend Analytics of Soil Moisture, Precipitation, Evapotranspiration, Highest and Lowest Temperature over a monthly temporal resolution data from Terraclimate.

- **PySteel: A Python Library for Steel Section Designing**
  (Guide : Prof. Somnath Majumder, Assistant Professor, TICT, Kolkata, Sept,2017-May,2018)

  Designing and Development of a complete Python Package for Designing Plate Girder and Gantry Girder economical and efficient section as per IS800-2007 Code Provision.
  Source code - https://github.com/yajnab/pysteel

- **Eagle Tools for Infrastructure Accessibility Analysis**
  (Guide : Dr. Pooja Nigam, Assistant Professor, MNIT, Jaipur, July-August,2017)

  The project targets the creation of Infrastructure Accessibility Maps using Urban Street Network Maps and places information from OpenStreetMap and Google Places API, and components written for Grasshopper 3D for McNell Inc. Rhinoceros 3D .

- **Stock Market Prediction System using Hadoop**
  (Guide : Prof. Nizamuddin Laskar, Assistant Professor, TICT, Kolkata, Sept-Nov,2016)

  To develop a system for real-time collection of Stock Market Data using Selenium web scrapping and using Hadoop and TensorFlow to Predict future price