Rutvik Joshi

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AREAS OF INTEREST

Autonomous Drone Surveying and Inspection, Safety monitoring & Construction Robots, Big Data for Predictive maintenance, Project Planning and Development, Infrastructure Management, 3-D printing solutions

EDUCATION

Bachelor of Technology, Civil Engineering September 2018-April 2022

VJTI, University of Mumbai, India CGPA: 8.17/10

Relevant Courses: Calculus, Differential Equations, Matrices, Probability, Statistics and Numerical Methods, Computer Programming, Optimization and Decision Sciences

EXPERIENCE

FOSSEE -Osdag | *Project Research Assistant* April 2023 – Present

FOSSEE project funded by Ministry of Education-India, to promote the use of FLOSS tools in academia and research. Osdag is an Indian Institute of Technology Bombay developed Steel Design Software.

- Expanded Osdag's Struts and Flexural member design modules using Python, significantly enhancing its functionality.
- Spearheaded usability testing initiatives to identify and address user pain points, optimizing the overall user experience.
- Devised innovative methods to enhance the functionality of existing features and provide greater user control, empowering engineers and researchers.
- Guided interns to create a functional prototype for Osdag on cloud, leveraging Django, Three.js, and React, paving the way for future cloud-based deployment.
- Promoting Osdag at the G20 Pune Event as an IIT-B representative effectively expanded its reach and impact within the engineering, teaching, and research communities. Contributed to its wider adoption and fostered a more collaborative environment for software development.
- Enriched students' software development and open-source tools proficiency through engaging Spoken-Tutorial Workshops and Activities.

Burns and McDonnell India | *Trainee Structural Engineer* July 2022 – March 2023

As part of Global Facilities (GFS) teams, got opportunity to work across various industries and collaborate with other disciplines to deliver engineering solutions.

- Design of Anchor bolts, Retaining walls, Pipe rack structures, Foundation design for Electric vehicle infrastructures, Prefabricated Structures, Pharmaceutical, Oil & Gas and Manufacturing projects in accordance with the Industry Practices.
- Develop Excel sheets for Load calculation using VBA and ASCE7-16.
- Carried out the project scheduling and looked after the daily monitoring activities, resource and labor allocation for all Electic Vehicle Infra projects.

FOSSEE-Osdag | *Software intern* Mar 2022 - August 2022 & Mar 2021 - June 2021

- Develop Python file for Column design, redesigned GUI layout. The OOP and DSA concepts have been effectively employed in various aspects of Osdag's development, leading to a maintainable and extensible codebase that facilitates the introduction of new modules and features.
- Assessment of quality and methodology in Spoken-Tutorial for Osdag to ensure the effectiveness of training materials.
- The development of Excel sheets facilitates rigorous validation of the Python program, enhancing the software's reliability.
- Comprehensive LaTeX documentation to provide clear and detailed information for users, promoting effective utilization of the software's features.

ACADEMIC PROJECTS

1. **0 to 9 image multiclassification**
   - Developed an image multiclassification model using TensorFlow and Keras that achieved an accuracy of 99.64% on 5000 grayscale images with a 20x20 pixel resolution.
   - The model utilized a Sequential architecture with two ReLU activation layers, followed by a linear activation layer and a Softmax output layer.
   - Training was performed using Gradient Descent with the Adam optimizer and the Sparse Categorical Cross entropy loss function.
2. **Land Lunar Lander on landing pad**
   - Successfully trained a reinforcement learning agent using Deep Q-Learning and Experience Replay to land the Lunar Lander on the landing pad within the OpenAI Gym Library environment.
   - The agent's performance was evaluated using the Mean-Squared Error loss function, demonstrating its ability to learn and adapt to the challenging task of landing the Lunar Lander safely and accurately.
3. **Final Year B.Tech Project: Study of Modern Bridge Monitoring Techniques**
   - Determined the workflow for Damage Detection and heuristic model training based on the use of Artificial Intelligence and Data Management systems in existing literature.
   - Analyzed different data collection and processing methods and application of Deep Neural Network to assess rate of crack on concrete structures.
   - Investigated the drawbacks of current systems and the scope of Computational Intelligence in the optimal placement and failure of sensors.
4. **House price prediction**
   - Developed a house price prediction model using Scikit-learn and Linear Regression with Gradient Descent that achieved an accuracy of 95.51% on a dataset of 97 houses sold in the location.

5. **Student admission prediction**
   - Developed a student admission prediction model using Logistic Regression with Gradient Descent and Sigmoid activation function that achieved an accuracy of 83% on a dataset of 120 data points.

ONLINE COURSES & CERTIFICATIONS

- **Python for Everybody** | *May-2020* — University of Michigan
- **Mathematics for Machine Learning and Data Science** | *December-2023* — DeepLearning.AI
- **Machine Learning** | *June-2022* — DeepLearning.AI
- **SQL for Data Science** | *May-2020* — University of California, Davis
- **Python with NumPy for DS & ML** | *October-2021* — Udemy
- **Introduction to Programming with MATLAB** | *June-2022* — Vanderbilt University
- **Google Data Analytics Professional Certificate** | *(ongoing)* — Google
- **Data Structures and Algorithms** | *(ongoing)* — GeekforGeek
- **Deep Learning** | *(ongoing)* — DeepLearning.AI
- **Kinematics of Mechanisms and Machines** | *March 2023* — NPTEL Online Certification
- **Geographical Information Systems** | *May-2020* — École Polytechnique Fédérale de Lausanne
- **Mastering bitumen for better roads and innovative applications** | *April-2020* — École des Ponts ParisTech
- **The Art of Structural Engineering: Bridges** | — Princeton University, edX
- **Sustainable Office Complex** | *July-2020* — SCS Webinar
- **BIM Fundamentals for Engineers** | *July-2020* — National Taiwan University
- **3D CAD Fundamental & Application** | *August-2020* — National Taiwan University

SKILLS

- **Programming:** Python, C++, Matlab, Bash programming, OOP & Data Structures
- **Libraries:** Numpy, Pandas, Matplotlib, Seaborn, scikit-learn, TensorFlow, Keras, PyLaTeX, PyQt
- **Miscellaneous:** MySQL, Visual Studio code, Pycharm, Jupyter Notebook, Excel, Git, Google Colab

EXTRACURRICULARS

1. **Indian Green Building Council (IGBC) VJTI Chapter| 2022**
   - Organized activities to bring awareness on climate change
   - Held a poster presentation competition on sustainable solutions to reduce the negative effects of urbanization.
   - Created short videos to raise awareness of environmental problems and offer solutions used by cities around the world on a case-by-case basis.
2. **Entrepreneurship Secretary for Civil Engineering Students Association (CESA) | 2021**
   - Organized a nationwide research paper presentation contest for students from various institutions. expert panel consisting of Professors from prestigious universities presided over the events.
   - Conducted seminars on startups and invited guest speakers.
   - Workshops for students to pool their ideas for a startup and conducting guest lectures.
3. **Contribution to Cauvery Upasaka: Tree plantation initiative | 2020**