

TUSHAR PARMANAND BUDHWANI

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“Aspiring Software Developer with a solid foundation in full-stack development and a focus on Machine Learning and Cybersecurity.”

EDUCATION

- University of Massachusetts Amherst | Master of Science in Computer Science (GPA: 3.9/4.0)** **Sep 2023 - May 2025**
- Courses: Information Retrieval, Software Engineering, Machine Learning, Computer & Network Security, Intelligent Visual Computing (using Neural Networks), Business Intelligence & Analytics
- University of Mumbai | Bachelor of Engineering in Computer Engineering (GPA: 3.8/4.0)** **Aug 2019 - May 2023**
- Courses: Artificial Intelligence, Database Management, Operating Systems, Data Structures & Algorithms, Cloud Computing, Natural Language Processing, Data Warehousing & Mining

TECHNICAL SKILLS

Programming Languages: Python | Java | C | C++ | SQL | JavaScript
Full Stack Development: React.js | Node.js | HTML/CSS | AJAX | Bootstrap | MySQL | JQuery | PHP | Laravel | Django
Python Libraries: NumPy | Pandas | Scikit-learn | NLTK | Matplotlib | TensorFlow | Keras | PyTorch | Seaborn
Others: Quantitative Analytics | Predictive Modeling | AWS | GCP | PowerBI | Tableau | Docker | Git | GitHub | JIRA | Postman | Figma

PROJECTS

- Personalizing LLMs (Large Language Models) based on User Profile** (Python | LLM | NLP | Deep Learning) **Dec 2023**
- Devised a system for generating precise prompts based on retrieved articles and fine-tuned the LLM to improve response accuracy.
 - Developed a query generation function using Lexical Augmentation, elevating accuracy by 44.7% with a 120% F1-score increase.
 - Optimized retrieval with a top-k article extraction method using BM25 retriever.
- Generative 3D Reconstruction from Single Image Analysis** (Python | Deep Learning) **Apr 2023**
- Improved a deep learning model to transform 2D images from ImageNet into high-detail 3D models, increasing visual depth and realism.
 - Refined texture quality with a multi-resolution triplane sampling strategy, improving performance without extra computational burden.
 - Incorporated advanced AI technologies such as CLIP and depth estimation to convert 2D images into accurate 3D structures precisely.
 - Established robust evaluation protocols with FID and Inception Score to enhance the quality of 3D models.
- ML-Based Web Platform for Early Detection of Fatal Diseases** (Python | Scikit-learn) **Feb 2023**
- Created and assessed various models (SVM, Random Forest, XGBoost, ADABOOST), determining the most effective for each disease.
 - Applied preprocessing methods like Feature Engineering and SMOTE, boosting prediction accuracy by 4%.
 - Constructed a Stacking Ensemble model (Logistic Regression, KNN, Decision Trees) with a leading 91.3% accuracy in heart disease prediction among seven ML models.
 - Achieved an AUC-ROC score of 0.92, exceeding baseline models by 25%.
- Social Media platform for Researchers and Developers** (Laravel (PHP) | JavaScript) **Mar 2022**
- Formulated a data-driven user matching algorithm using weighted scoring to connect researchers and developers based on shared interests and skills, enhancing user experience and interdisciplinary collaboration.
 - Enhanced database performance by optimizing SQL queries and introducing indexed views in MySQL, which sped up data retrieval by 40% for complex searches.

INTERNSHIP EXPERIENCE

- Full Stack Development Intern | Infovue Solutions** **Aug 2021 - Jan 2022**
- Engineered Project Management System backend with Node.js and MongoDB, incorporating JWT, OAuth, and multi-factor authentication.
 - Utilized Redux for state management, ensuring consistent UI updates and session continuity, and used Redux DevTools for debugging.
 - Enhanced CRUD operations, boosting system integrity and efficiency, reducing login times by 40%, authentication errors by 60%.
 - Led a team of 4 to create a MERN client-server architecture, reducing page reloads by 50% and enhancing cross-browser compatibility.
 - Implemented RESTful APIs with Node.js and Express.js, enabling robust, scalable data exchanges and enhancing system security.

PUBLICATIONS

- Research Patent: Enhancement of Advanced Encryption Standard Algorithm to secure IoT devices.** **Aug 2022**
- Indian Patent Application No. 202221045319 A, The Patent Office Journal No. 33/2022, Date of filing: Aug 8, 2022
 - Proposed a **faster alternative to the AES algorithm** for lower-powered IoT devices and real-time secure communications.
- Research Project: Offensive Web Application Security Framework | ICETESM** **Feb 2022**
- Assembled a sophisticated scanning engine to detect various web app vulnerabilities, utilizing open-source tools for in-depth security analysis.