

# Pragyan Das

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## EDUCATION

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- **University of Wisconsin-Madison** Madison, WI  
*Bachelor of Science in Computer Science; GPA: 3.75* Aug 2019 - Dec 2022

## EXPERIENCE

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- **DTV Innovations** Elgin, IL  
*Software Engineer* Apr 2024 - June 2025
  - **Low-Latency Video Processing Pipeline:** Designed and implemented distributed video encoding system using VAAPI and Intel Quick Sync with FFmpeg, achieving sub-100ms latency for broadcast-grade streaming. Optimized GOP structure, bitrate control algorithms, and buffer management to handle high-throughput video streams (1080p60/4K) in production on the **OX-4 Platform**.
  - **Encryption System Architecture & Open-Source Contribution:** Architected comprehensive BISS encryption support across multiple standards (BISS-1, BISS-E, BISS-CA) using Bouncy Castle and TSDuck. Designed custom encryption/decryption modules for real-time video stream scrambling while maintaining DVB/ETSI standards compliance. Contributed upstream patches to TSDuck open-source project extending native BISS-CA capabilities, with code accepted and merged into main repository.
  - **System Integration, Automation & QA Optimization:** Built real-time DASH playback monitor using dash.js and JavaScript, reducing QA cycle time by 40% through automated validation and continuous monitoring. Developed robust Java-C interoperability layer via JNI enabling seamless communication between UI components and hardware systems. Architected reusable, modular menu framework reducing code duplication by 60% across multiple product lines.
- **Synkriom** Piscataway, NJ  
*Software Engineer* Apr 2023 - Apr 2024
  - **Distributed Microservices Architecture & API Development:** Designed and deployed production Dockerized microservices using Flask and Python serving multiple teams. Built scalable RESTful APIs with error handling, logging, rate limiting, and monitoring. Integrated OpenAI Whisper API for speech-to-text and LangChain for LLM orchestration, processing interview recordings into structured assessments and eliminating hours of manual analysis per candidate.
  - **Machine Learning Pipeline & Algorithmic Optimization:** Developed intelligent recruiting platform leveraging GPT-based NLP to analyze job descriptions and candidate profiles. Implemented data processing pipeline using semantic embeddings and similarity algorithms, achieving 15% improvement in matching accuracy and reducing time-to-hire through algorithmic optimization and prompt engineering.
- **SKAI Worldwide** San Francisco, CA  
*Software Engineer Intern* Sep 2022 - Dec 2022
  - **Database System Development, Security & Testing:** Contributed to **Apache AGE**, open-source PostgreSQL extension enabling graph database functionality. Implemented node/edge management, Cypher query parsing, and graph traversal algorithms in C for scalable operations. Identified and mitigated critical SQL/Cypher injection vulnerabilities in Go and Python drivers through input sanitization and parameterized queries. Developed comprehensive **regression test suites** validating core operations, improving system reliability and security.

## PROJECTS

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- **Scene Recognition AI (PyTorch, Deep Learning):** CNN-based classifier achieving 93% accuracy on MiniPlaces. Optimized through hyperparameter tuning, data augmentation, batch normalization, and learning rate scheduling.
- **Proton -Discord Bot (Node.js, Distributed Systems):** A multipurpose JavaScript bot for the messaging app Discord designed to handle server administration, playing music, and user verification. Employed YTDL to retrieve music videos that are reduced to its audio component using FFmpeg.

## TECHNICAL SKILLS

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**Languages:** Python, C, C++, JavaScript, Java, SQL, Bash

**Tools & Technologies:** Git, Linux, Docker, AWS (Certified Cloud Practitioner), FFmpeg

**Frameworks & Libraries:** Node.js, React.js, Flask, PyTorch, TensorFlow

**Core Competencies:** Data Structures & Algorithms, System Design, Distributed Systems, API Development, CI/CD