# Manas Pandey

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## PROFESSIONAL SUMMARY

Engineer driven to solve complex hardware-level software challenges. Proven builder of intelligent systems for wireless, AI, and autonomous applications.

## EDUCATION

### MANIPAL UNIVERSITY JAIPUR

Bachelor of Technology, electronics and communication engineering

Sep 2021 - Nov 2025 | Jaipur, IND

## SKILLS

### PROGRAMMING & DEVELOPMENT:

Python, C/C++, MATLAB, HTML/CSS, SQL, Git.

### DATA & AI:

Machine Learning, Deep Learning, Computer Vision, Data Analysis, Predictive Modeling, NLP, Reinforcement Learning, OpenCV, PyTorch, TensorFlow, Keras, ScikitLearn, Fast API, Streamlit.

### ELECTRONICS & EMBEDDED SYSTEMS:

PCB Design, IoT, ROS, Arduino, Raspberry Pi, Micro-controllers, Signal Processing, RF Circuit Design, Software-Defined Radio (SDR), GNU Radio, MATLAB Simulink, CST Suite.

## CERTIFICATIONS

- Power Electronics, University of Colorado Boulder
- IBM Generative AI Engineering, IBM
- MATLAB Programming for Engineers and Scientists, Vanderbilt University
- IBM Deep Learning with PyTorch, Keras and Tensorflow, IBM
- MLOps | Machine Learning Operations, Duke University
- IBM Data Science, IBM
- DeepLearning.AI TensorFlow Developer, DeepLearning.AI
- Foundation of Ethical Hacking, Udacity

## PUBLICATIONS

Experimental Investigation on Spectrum Sensing Testbed Using GNU Radio and SDR, Springer Nature, May 2023

## WORK EXPERIENCE

### RESEARCHER  | MUJ ⬈

Feb 2022 - Jun 2023 | Jaipur, IND

- Implemented energy detection-based spectrum sensing using Software-Defined Radio (SDR) and GNU Radio, creating a flexible testbed for cognitive radio research.
- Overcame challenges including processing delays, false alarms, misdetections, and weak signal detection through algorithm development and testing.
- Conducted statistical data analysis on experimental results to validate system effectiveness and scalability.

## TECHNICAL PROJECTS

### HTTP-SERVER ⬈

Python · Web Server · Non-blocking I/O · Event-driven Architecture

- Developed a non-blocking, event-driven HTTPS/WSGI web server for scalable, concurrent request handling.
- Implemented core asynchronous I/O features, including request parsing, response generation, and network error handling.

### DBLITE ⬈

Python · In-Memory Database · Data Structures · Concurrency

- Created a lightweight, in-memory Redis-like database in pure Python, supporting data structures including strings, lists, hashes, sets, and key expiry with optional gevent concurrency.
- Optimized for performance in resource-constrained environments, enabling fast data operations and persistence simulations.

### GITLITE ⬈

C++ · Version Control System · Git · SHA-1 Hashing · Zlib Compression.

- Built Git functionalities, including blobs, trees, commits, SHA-1 hashing, and zlib compression for version control.
- Simulated repository management to track changes and maintain history, showcasing low-level systems programming skills.

### C-LIKE ⬈

Python · Language Interpreter · Parser · AST

- Implemented a Python interpreter for a custom C-like language, featuring lexer, recursive-descent parser, abstract syntax tree (AST), semantic analyzer, and call stack management.
- Enabled execution of structured code, demonstrating compiler design and language processing principles.

### BARECODEX ⬈

C++ · Video Codec · Compression Algorithms · YUV420 · Zlib.

- Engineered video codec in C++, converting raw RGB video to YUV420, applying delta encoding, and compressing with DEFLATE (zlib).
- Demonstrated video compression fundamentals, reducing file sizes while maintaining quality for multimedia applications.

### FLEXIBLE MICROSTRIP PATCH ANTENNA ⬈

Antenna Design · RF Engineering · Simulation · Fabrication

- Designed and simulated a flexible microstrip patch antenna for wireless communication, optimizing for performance in bendable applications.
- Utilized tools like CST Suite for electromagnetic simulations and testing.