Dinesh Kumar Rana

(+91) 9304650646 | dkr9304650@gmail.com | linkedin.com/in/dinesh-rana-063680244 | github.com/DineshRana716

TECHNICAL SKILLS

Java, JavaScript, React.js, Vue.js, Typescript, Node.js, Express.js, WebSockets, API Development, SQL, MongoDB, MySQL

PROJECTS

ChatConnect
- Built a real-time chat application using the MERN stack and Socket.IO to enable low-latency messaging.
- Implemented private (one-to-one) and group chat rooms with real-time message delivery and presence indicators.
- Added JWT-based user authentication and role-aware access control to secure endpoints and sockets.
- Designed a responsive UI in React with Tailwind CSS, including message threads, typing indicators, and read receipts.
- Optimized backend for scale: used Redis for socket session store, implemented message pagination, and indexed MongoDB collections for fast queries.

Movie Recommender System
- Developed a hybrid movie recommendation engine combining collaborative filtering and content-based techniques for improved relevance.
- Implemented user- and item-based collaborative filtering using cosine similarity and Pearson correlation to capture behavioral patterns.
- Extracted content features (genres, keywords, cast) and engineered TF-IDF vectors for content-based similarity scoring.
- Built modular pipelines with Pandas and scikit-learn for preprocessing, feature extraction, model training, and evaluation.
- Provided reproducibility via a requirements.txt and clear project structure (data/, src/, models/, notebooks/) with evaluation metrics (precision@K, recall@K, RMSE).

Offline Device-to-Device Communication Protocol
- Designed a custom audio-based communication protocol inspired by TCP/IP, enabling mobile devices to exchange data offline using ultrasonic signals up to 1.2 meters apart.
- Implemented real-time modulation/demodulation of binary payloads using Android's AudioTrack and AudioRecord APIs at 32 bytes/sec transmission speed.
- Achieved 95% message delivery accuracy under controlled noise conditions through checksum validation and retry mechanism.
- Explored potential applications including information retrieval, offline peer-to-peer payments, IoT communication, and emergency broadcast systems in network-denied environments.

ACHIEVEMENTS

- Achieved a LeetCode Contest Rating of 1565, ranking in the top 28% globally.
- Solved 300+ DSA problems across arrays, linked lists, trees, graphs, and other algorithmic domains.
- Participated in 22+ LeetCode contests, consistently improving ranking and problem-solving efficiency.
- Secured a top 50 rank out of 1,000 participants in an intra-college coding challenge.

EDUCATION

VIT Bhopal University   Bhopal, MP
Bachelor of Technology in Computer Science and Engineering   *Nov 2022 – Present*

GGPS (CBSE)   Bokaro, Jharkhand
Senior Secondary (12th)   *April 2020 - July 2021*

St. Clare's (ICSE)   Koderma, Jharkhand
High School (10th)   *April 2018 - April 2019*