

## SANDIP THAPA

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### EDUCATION

**Tribhuvan University, Electrical and Computer Department**

**Bachelor of Engineering (BE)**, Computer Engineering,

Thesis: MapGAN: Generating Maps Using Aerial Images

**Dharan, Bagmati, Nepal**

*Nov 2017 - Mar 2022*

2022

### RESEARCH EXPERIENCE

- **MapGAN: Generating Maps From Aerial Images** Sep 2022
  - Used Generative Adversarial Networks to do the research
  - Collected own dataset using drones and Google Maps and used it to train the model
  - Detailed study in Generators and Discriminators
- **Cultivating & Harnessing Language Models with DeciML: A Blockchain-Driven, Incentivized Framework** (Unpublished)

The DeciML Ecosystem pioneers a token, termed as DeciML Token (DMT), aimed at incentivizing active contributors to the system, including providers of training data, constructive feedback, model fine-tuning, and computational resources to fuel the model. Furthermore, the DeciML Interface (DeciML-IF), a user-friendly API, grants interaction with the large language model (LLM), where usage costs are enforced via the DMT cryptocurrency.
- **Automatic Smart Contract Audit Using LLM** (Unpublished)

Using RAG for effectively allowing the model to pull in information from a vast database as it generates text. This can be incredibly useful for staying up-to-date with the latest vulnerabilities and attack vectors, which are constantly evolving in the blockchain space.

### PROFESSIONAL EXPERIENCE

**Pastel Software Solutions** **Pastel – A Leading Blockchain Development Company**

**Bharatpur, Bagmati, Nepal**

Located in Chitwan, Nepal, Pastel is one of the fastest growing technology companies in South Asia. In just 2 years of its formation, it have supported 8+ companies through their projects in Blockchain, Data Science, AI and Application Development.

*Junior Blockchain/Node Engineer*

*Sep 2022 – Present*

#### Projects

- **Multi-chain Wallet Browser Extension**
  - Investigated the operational principles of browser extensions and compiled a guide on their development techniques.
  - Delved into the fundamental aspects of Zilliqa, including its architecture, the practical Byzantine fault tolerance (pBFT) consensus algorithm, and sharding processes.
  - Crafted the cryptocurrency wallet extension employing the ReactJS JavaScript library for a seamless user experience.
  - Established a link for data exchange between the wallet extension and both the Zilliqa blockchain and Ethereum Virtual Machine (EVM) through Remote Procedure Call (RPC) protocols.
- **Infinity Sound (Reward Based Music Streaming app using Aptos Blockchain)**
  - Developed and deployed smart contracts on Aptos Blockchain for NFT creation and the fractionalization of these NFTs into fungible assets
  - Ensured seamless integration of blockchain functionalities with the app's backend
  - Implemented server-side logic for video streaming, including storage, retrieval, and streaming functionalities
  - Developed APIs for communication between the frontend, blockchain network, and other services
  - Developed strategies for the creation, fractionalization, and distribution of music NFTs
  - Oversaw the management of both non-fungible and fungible assets, including sales, transfers, and ownership tracking
- **Building a Metaverse Blockchain (Cosmos SDK POC)**
  - Conducted comprehensive research on the Cosmos SDK to understand its core features and modular design.
  - Explored customization options of the Cosmos SDK to suit the needs of a Metaverse platform.

- Implemented the Cosmos SDK's Inter-Blockchain Communication (IBC) protocol for blockchain interoperability.
- Acquired introductory knowledge of WebAssembly to support CosmWasm in converting Rust-based smart contracts to web-compatible formats.
- Investigated the integration of CosmWasm into our blockchain, enabling the addition of plugins to enhance blockchain functionality.
- **Decentralized Exchange (EVM)**
  - Analyzed the Uniswap whitepaper to grasp Automated Market Maker (AMM) protocols, with a focus on liquidity pools and the mechanisms of token swapping.
  - Created and introduced a bespoke ERC20 token to serve as the primary currency for liquidity and token exchanges on the Decentralized Exchange (DEX).
  - Integrated price oracles into the DEX to provide accurate, real-time pricing, essential for equitable and stable trading conditions.
- **Launchpad**
  - Developed a smart contract for Initial DEX Offering (IDO), incorporating features for token purchasing, withdrawal, and adherence to security best practices.
  - Implemented automated vesting in smart contracts to regulate the token distribution schedule for stakeholders and investors.
  - Formulated and applied liquidity provision strategies to ensure liquidity on decentralized exchanges post-IDO.

**Sikshya Technology**  
Junior Blockchain Engineer

**Kathmandu, Bagmati, Nepal**  
Jul 2022 – Aug 2022

#### Projects

- **Zilliqa Based Wallet Browser Extension**
  - Explored the functional programming language OCaml and the smart contract language Scilla, focusing on their applications in blockchain development for creating a cryptocurrency wallet browser extension.
  - Investigated Zilliqa's blockchain platform to leverage its features for the efficient operation of the crypto wallet extension, emphasizing security and user interaction.
- **Decentralized Exchange (Zilliqa)**
  - Acquired knowledge in Scilla, a functional programming language tailored for crafting smart contracts on the Zilliqa blockchain.
  - Developed a DEX prototype incorporating features such as an automated market maker, liquidity pools, swaps, and the integration of smart contracts.
  - Constructed a web-based decentralized exchange platform utilizing ReactJS, offering a user interface that facilitates interaction with the cryptocurrency wallet.

**Code Himalaya**  
ReactJS/Node Intern

**Kathmandu, Bagmati, Nepal**  
Apr 2022 – Jun 2022

- Completed a 3-month internship focusing on ReactJS/NodeJS, where I gained foundational knowledge in React basics and hooks, in addition to server-side programming with Node.js
- Contributed to a canteen ordering system project, enabling item orders through QR codes, developed a UEFA fixtures creator
- worked on an email warm-up tool to enhance email deliverability for business use, preventing them from being marked as spam

#### SKILLS

- **Software:** Tableau, Power BI, Snowflake, Ms Office,
- **Teaching:** Teaching Assistant (C and C++) for 6 months, Home Tuition (Grade 9-12) for 3 Years
- **Research:** MapGAN (1 Year), Cosmos SDK(3 months), DeciML (5 months- ongoing)

#### AWARDS and GRANTS

- Full Scholarship For BE (2017), Government Of Nepal, \$2550 (90% Scholarship) Nov 2017

## PUBLICATIONS

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- Timsina, A., Thapa, S., Chhetri, P., Kamat, S., Shah, D. R., Shah, R., & Sharma, R. (2022). MapGAN: Generating Maps from Aerial Images.

## LANGUAGES AND INTERESTS

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- **Languages:** Nepali (native), English (basic), Hindi(basic)
- **Interests:** Hiking, Tennis, Badminton, Swimming, Testing New Techs