KALPIT **BORKAR**

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[Github](https://github.com/kalpitborkar/) | [Linkedin](https://www.linkedin.com/in/kalpitborkar/) | [Portfolio](https://kalpitborkar.github.io/)

**Education**

**Indian Institute of Technology Bombay**

Bachelor of Technology in Electrical Engineering

Pursuing Minor in Computer Science

**Skills**

Languages: C++, Python, JavaScript, Go, Assembly, VHDL

Technologies: Node.js, Express.js, MongoDB, HTML5, CSS3, Pug, Git

ML Frameworks: TensorFlow, Keras, OpenCV, Matplotlib, Pandas

**Selected Projects**

**Spanning Tree Protocol** | [[link]](https://github.com/kalpitborkar/Spanning-Tree-Protocol) • Devised an algorithm to implement spanning tree protocol in **C++** to prevent looping in the network

• Built a LAN-bridge topology to simulate a physical network with up to 26 LAN ports using OOPs

• Created a packet-tracer for debugging, tracing, and analysing packet transfers in real-time

**Library Management REST API** | [[link]](https://github.com/kalpitborkar/Library-Management-REST-API) • Implemented CRUD functionalities on server-side to access and modify data using **Node** and **Express**

• Connected server to **MongoDB** database to store various entities created using **Mongoose**

• Created 33 routes and controllers to request and update information

**Python Git Implementation** | [[link]](https://github.com/kalpitborkar/PyGit)

• Developed Git version control system reimplementing all fundamental features of git from scratch.

• Implemented commands like add, cat-file, checkout, commit, hash-object, init, log, ls-tree, merge,

rebase, rev-parse, rm, show-ref and tag

**Chip-8 emulator** | [[link]](https://github.com/kalpitborkar/Chip8-Emulator)

• Emulated Chip-8 by creating an 8-bit microcomputer virtual machine to run chip-8 programs

• Enforced opcodes, cycles, stack, audio & visuals using **C++** to build the infrastructure of chip-8

• Applied **SDL2 library** to provide low level access to keyboard to interact with the programs

**Python Interpreter** |[[link]](https://github.com/kalpitborkar/Byterun-Python-Interpreter)

• Built a virtual stack machine to manipulate several stacks and perform its operations purely in **Python**

• Implemented virtual machines, frames, functions and blocks to create the interpreter

**2D Physics Engine** |[[link]](https://github.com/kalpitborkar/2D-Physics-Engine)

• Created a 2D Physics Engine to simulate particle collisions, gas cloud, soft body and springs in **C++**

• Designed algorithms to simulate particle collision, attraction, combination, acceleration, bounce, etc

**Face Anti-Spoofing System** |[[link]](https://github.com/kalpitborkar/Face-Anti-Spoofing-System)

• Built a face anti-spoofing system by implementing Resnet 50 V2 feature vector using **TensorFlow**.

• Increased the accuracy of the system by 17% using data augmentation techniques and integrating Haar

Cascade model in the system achieving 94.8% validation accuracy.