

# Cloud Labs

## Accessible Hardware Lab Experiments

### Technology Description

Cloud Lab enables professors, research engineers, lab engineers and students to perform the various hardware based experiments on the actual hardware online by means of its Platform developed by integrating these hardware with their custom device and software. Cloud Lab platform facilitates high end experiment on various FPGA Boards easy primarily for the students and researches of areas Embedded System, Digital System, Robotics and Mechanotronics. It facilitates management of resources with optimal utilization of these hardware device among the large pool of students in a classroom. Cloud Lab is, an innovative platform at the forefront of reshaping hands-on learning for the digital era. It facilitates unparalleled remote access to hardware resources, mitigating the need for physical presence within traditional laboratories. Through an integrated web application, users engage in real-time experimentation with FPGA boards and diverse hardware components. It offers versatility across a multitude of domains, including Embedded Systems, Digital System Design, IoT, Robotics, Mechatronics, AI Accelerators, and more.

### Theme

Based upon the theme of "Virtualizing Labs, Advancing Education", Cloud Labs emerges as a transformative solution, employing live board-streaming, real-time controls, and automated hardware configuration processes. It envisions a future where the boundaries of traditional labs are transcended, offering a virtualized space that empowers learners and researchers to explore, experiment, and excel in the intricacies of hardware-based concepts.

### Features

- Access hardware resources remotely.
- Experience real-time control of hardware switches
- Cut costs associated with physical labs
- Book slots at your convenience
- A track record of 30,000+ bookings.

### Applications

- Minimal failure rate in hardware bookings.
- Easily integrate Cloud Labs into existing educational ecosystems.
- Super admin section for seamless course and board management.

### Users & Use Cases

Considering The surging demand for innovative, remote learning solutions in technical education. Cloud lab aligns seamlessly with the widespread adoption of online and remote learning, providing an opportunity to serve learners and institutions worldwide. As educational budgets tighten, Cloud Labs stands out as a cost-efficient alternative to traditional labs, offering a streamlined and accessible experience without compromising the quality of hands-on learning. The scalability of Cloud Labs, combined with its diverse applications in areas such as Embedded Systems, IoT, Robotics, and AI, aligns perfectly with the market's demand for comprehensive and adaptable solutions.



Setup Glimpse

### Target Users

Cloud Labs is strategically designed to meet the needs of a diverse user base within the academic and research communities. Primary among these are students pursuing technical disciplines at both undergraduate and graduate levels, benefiting from the platform's dynamic and accessible approach to hands-on learning. Cloud Labs caters to a broad spectrum of users, ranging from corporate training programs, and even individual enthusiasts, providing a versatile and accessible solution for hands-on technical learning in a remote and collabora

## List of Features:

- Cloud Labs enables users to remotely access and interact with physical hardware resources, such as FPGA boards, providing a seamless virtualized environment for experimentation.
- It provides real-time control interfaces for selected board switches and push buttons, allowing users to manipulate hardware components in real-time through virtual interfaces on the web application.
- It features a booking system where users can reserve time slots to access specific hardware resources, ensuring organized and scheduled usage, particularly in educational environments.
- Supporting a diverse range of hardware domains, including Embedded Systems, Digital System Design, IoT, Robotics, Mechatronics, AI Accelerators, and more, providing a comprehensive solution for various technical disciplines.
- Developed to scale effortlessly, accommodating a growing user base and evolving hardware requirements
- Streamlines the hardware configuration process, automating the setup of connected boards, ensuring a quick and efficient transition between experiments.

## Work Done Update [TRL: 9]

The Innovation has reached into the final stage with the completion of the research and Development work, showcasing its innovative features and multifunctional capabilities. Advanced level feedback testing has been successfully conducted, incorporating valuable insights to refine and enhance the purpose. Ready for Setup and Deployment in demanding Institutions.