TRL : 7

Cloud Labs Accessible Hardware Lab Experiments

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Description

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. It enables students, professors, research engineers, lab engineers 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.

The Cloud Lab platform facilitates high-end experiments on various FPGA boards, primarily for students and researchers in the fields of Embedded Systems, Digital Systems, Robotics, and Mechatronics. It enables efficient management and optimal utilization of these hardware devices among a large pool of students in a classroom setting.

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 experiment.

Applications

- Facilitates real-time collaboration for students and researchers working remotely on shared hardware.
- Customizable integration with specific hardware and software to meet institutional needs.
- Scalable platform capable of handling large student pools without resource bottlenecks.
- Centralized dashboard for administrators to manage courses, hardware, and bookings efficiently.
- Reduces the need for physical lab infrastructure, lowering operational costs.
- Enhances the learning experience by providing hands-on experimentation with advanced technology remotely.

Use-cases

- Universities and colleges offering technical programs
- Schools with advanced STEM education initiatives
- Research institutions focused on embedded systems, robotics, and IoT
- Corporate organizations for employee training and development
- Technical training centers and vocational schools
- Government and educational organizations investing in digital learning platforms
- Private institutions with resources for high-end technological tools

Theme

Technological specifications

- Real-time controls
- Live board-streaming
- Remote hardware management
- Cloud-Based Command Execution
- Low-Latency Streaming Protocols
- Remote Configuration Tools
- Automation Frameworks
- Cloud Computing Services

Domain

- Education
- Automotive
- Aerospace
- Telecommunications
- Research & Development
- Information Technology
- Robotics

Theme

- IoT (Internet of Things)

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