TRL 7

GUI based Digital IC Tester

Technology Description

The proposed IC tester introduces advanced features to enhance efficiency and minimize waste in testing integrated circuits (ICs). It can selectively identify faulty functional blocks, reducing unnecessary resource wastage. The system also offers automatic IC type detection, eliminating the need for manual input and making the testing process more efficient. A unique real-time pin-diagram display aids in understanding IC configurations. The compact implementation using Raspberry Pi and a user-friendly interface through PySimpleGUI ensures ease of use and portability. This IC tester can significantly reduce electronic waste by identifying and reusing functional parts of faulty ICs, making it valuable for electronics manufacturing, educational labs, and environmentally conscious practices.

Technology Components

- ➔ Raspberry Pi (RPi)
- ➔ Python Programming
- ➔ PySimpleGUI (GUI Interface)
- ➔ Automated IC Type Detection
- ➔ Fault Detection Algorithms
- ➔ Real-time Pin-diagram Display

Applications

- Selectively identifies faulty functional blocks within ICs, minimizing resource wastage.
- Automates IC type detection, reducing manual errors and speeding up the testing process.
- Provides real-time pin-diagram display for easier visualization of IC configurations.
- Enables reusing functional components of faulty ICs, reducing electronic waste.
- Supports fast fault isolation and correction, enhancing IC production efficiency.

Who can be the potential users?

- **Electronics Manufacturers**: Can use the tester for efficient fault detection and quality control in IC production, improving product reliability.
- **Hardware Developers and Engineers**: Useful for quickly diagnosing faults in IC prototypes, aiding in faster development cycles and reducing debugging time.
- **Educational Institutions**: Beneficial for labs and teaching, allowing students to experiment with ICs and understand functional blocks without needing fully functional components.
- **Quality Control and Testing Teams**: Enables precise and automated IC testing, streamlining the quality assurance process in electronics production.
- **Research and Development (R&D) Labs**: Assists in testing innovative IC designs and identifying performance issues during the research phase.
- **Environmental Sustainability Organizations**: Helps reduce electronic waste by salvaging and reusing functional parts of faulty ICs, contributing to eco-friendly practices.

List of Features

- **Selective Fault Identification**: Pinpoints faulty functional blocks within an IC.
- **Automated IC Type Detection**: Automatically identifies IC types, reducing manual effort.
- **Real-time Pin-Diagram Display**: Visualizes the IC's pin configuration during testing.
- **Compact and Portable**: Built using Raspberry Pi for easy portability.
- **User-Friendly GUI**: Provides an intuitive interface using PySimpleGUI.
- **Resource Optimization**: Helps reduce electronic waste by reusing functional IC components.

Domains :

- Electronics Manufacturing
- Education and Research Institutes
- Recycling and Waste Management
- Quality Control and Testing
- Research and Development

Theme :

- Internet of Things (IoT)
- Artificial Intelligence (AI)
- Machine Learning (ML)
- Embedded Systems
- Automation and Control Systems

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