Project

Title

A Smart Electrical Component Identifier

Introduction

- Introduction
  - VR/AR — The Only Limit Now? — AR Image Detection at Interface that the project is based on
  - IP — Image Data Storage
  - AI — Artificial Intelligence
  - CV — Computer Vision — the component of a computer where the core computations are processed
  - VPU — Vision Processing Unit — An special component of a computer that is dedicated and optimized to handle tasks related to computer vision and image processing
  - CUB — Light Attention Module — A module that gives more importance relatively to the pixels of light, for body of a bird
  - CV — Light Scanning Tower — Light Detection and Ranging (LiDAR) technology that uses pulsed laser light to measure variable distances
  - AR — Alternating Current — Electrical current that oscillates
  - DC — Direct Current — Electrical current that flows in one direction
  - CNN — Convolutional Neural Network — Deep learning algorithm that specializes in processing images or sensory different fields
  - CNN — Computer Vision Design — Instructions are given to a computer that are translated into more complex code
  - PCB — Printed Circuit Board — A thin board that has on it copper tracks, traces, pads and other components made of conductive or specific dielectric that allows electrical signals to flow and interconnect components
  - SMT — Surface Mount Technology — Method for mounting components directly onto the surface of a PCB
  - PCB — Non-Smart Box — Commonly used in reference to a way of thinking similar to Flat Web, Dumb Web
  - PCB — Non-Smart Device — A commonly used in reference to a way of thinking accounting Flat Web, Dumbweb and Dumb Appliances
  - PCB — Non-Smart Component — Commonly used in reference to a way of thinking accounting Flat Web, Dumbweb and Dumb Appliances

Description

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  - Purpose — Making electronic components identifiable and searchable
    - Manual Identification — Manually searching
      - Resistors — Resistor — Digital — SMT Resistor
      - Capacitors — Ceramic — Electrolytic — Film — Tantalum — Supercapacitor
      - Inductors — Ferrite Core — Toroidal Inductor — Air Core — Multilayer Ceramic — SMT Inductor
      - Diodes — Rectifier — Zener — Schottky — Light Emitting Diode (LED) — Photodiode — Varactor
      - Transistors — BJT — MOSFET — JFET — IGBT — Darlington Pair
      - Integrated Circuits — DIP — SOP — QFP — BGA — QFN — SMT
    - Capacity for user to search — Capacity for the model to select
  - Use Cases — The ability to take a snapshot of the Component Data Sheet and scan the number searched for from the database, and the model which it belongs to, saving thousands of hours of time spent searching for each identifying component
  - Objectives
    - Data Gathering — Gathering the information needed for the project
      - Image Dataset — Gathering a dataset of images of electronic components to train the model on
      - Data Sheet — Find and compile a database that contains through CNN — Mostly is taken images by pressing a button, support for searching datasets
      - Circuit Dataset Gathering — Gathering of circuit diagrams, schematics, and PCB layouts
      - Other Dataset Gathering — Gathering other information of the model
      - Other Dataset Gathering — Gathering other information of the model — Gathering information on the model, such as the Data Sheet, Circuit Diagrams, Schematics, and PCB Layouts
    - Software Development — Software development
      - Software Learning — Learning how to code — Learning how to code in the programming language of the model
      - Further Dataset Gathering — Gathering more information of each type of component that the project is trained on
      - Image Inputting — Inputting the image into the model — Inputting the image into the model, and the model will recognize the image and identify the component
      - Post processing — Refining the output — Refining the output from the model, such as the Data Sheet, Circuit Diagrams, Schematics, and PCB Layouts
      - User Inputting — Gathering information from the user — Gathering information from the user, such as the Data Sheet, Circuit Diagrams, Schematics, and PCB Layouts
    - Testing with video footage from a mobile device — Testing the model with video footage from a mobile device — Testing the model with video footage from a mobile device, and the model will recognize the component and identify it
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