


# Venkat Anil Adibhatla

TAIWAN 

<https://github.com/anil-bit> 

## Data Scientist & Computer Vision Algorithm Developer

### PROFILE

Experienced machine learning and computer vision algorithm developer. 5 years of experience in applying computer vision, machine learning, and data science to solve real-world problems in the manufacturing industry. Have a broad experience and knowledge in statistics and different frameworks that are applicable in the development and deployment of models.

### PROGRAMMING LANGUAGES

- Python
- MATLAB

### HARD SKILLS

- Data Analysis
- Statistics
- Quantitative Analysis
- Machine Learning
- Debugging
- Modelling
- Probability
- Deep Learning

### TECHNICAL SKILLS

- NoSQL
- TensorFlow
- Matplotlib
- sql
- pytorch
- opencv
- pandas
- pyspark
- airflow
- Scikit-Learn
- Git
- keras
- point cloud library

### EDUCATION

**2018 – 2022**

**Ph.D. in ML & Computer Vision (Department of Mechanical Engineering), Yuan Ze University, Taiwan.**

My field of research is dedicated to applying computer vision, image processing, and machine learning techniques in detecting the defects on the surface of the printed circuit board. To improve the accuracy and precision with limited data, I have worked on the application of supervised and semi-supervised learning in detecting different types of defects on PCB such as single-shot learning, few-shot learning, and transfer learning methods. The above-described methods have been implemented in automatic visual inspection algorithms for quality inspection in a custom-developed CI/CD pipeline without human interference.

**2016 – 2018**

**Masters in ML & Computer Vision (Department of Mechanical Engineering), Yuan Ze University, Taiwan.**

GPA-3.71/4. Awarded as the Best performer in research and academics. Designed an Image Classification algorithm. An accuracy of 99% was achieved in detecting and classifying arrhythmia (Irregular heartbeat).

**2007-2012**

**B-Tech, Mechanical Engineering, Jawaharlal Nehru Technological University, India.**

### WORK EXPERIENCE

**2022(Nov) – present**

**Industrial Technology Research Institute (ITRI) & ISSA Technology Co. Ltd, Taiwan.**

**Mechanical & Mechatronics Systems Research Laboratories (MMSL)**

**Computer vision algorithm developer & Data scientist**

### PROJECTS & RESPONSIBILITIES:

#### **SENSOR FAULT DETECTION**

- This is a Binary Classification problem, in which the affirmative class indicates that the failure was caused by a certain component of the ABS.
- Designed and build the ETL pipeline from scratch .Responsible for EDA and feature engineering for model development.
- Developed and deployed on the cloud for industrial purposes with the help of Circle CI and Heroku.
- The problem is reduce by 60% due to unnecessary repairs. So has minimize the false predictions.

**Tech stack: Python, FastAPI, Machine learning algorithms, Docker, MongoDB, Kafka, postman**

#### **POINT CLOUD HOLE FILLING AND UPSAMPLING:**

- Developed an algorithm for up sampling point clouds that has been used as a preprocess for in-house IR camera output.
- We combine Inception DenseGCN with NodeShuffle into a new point-upsampling pipeline called PU-GCN. PU-GCN sets new state-of-the-art performance with much fewer parameters and inference that is more efficient.
- The model has been deployed on edge devices such as the Jetson TX2 after migrating the model into TensorFlow to identify the error and infer the inference speed during volume calculations of logistic containers.
- This hole-filling model has increased the accuracy of the volume calculation of containers by 13%.

## AWARDS

- Publication and outstanding Academic Performance 2022.
- Yuan Ze University PhD Scholarship, 2018 –2022.
- Yuan Ze University Masters Scholarship, 2016 –2018.

## CERTIFICATION

- Machine Learning masters and Deep Learning
- DeepLearning.AI TensorFlow Developer
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

## LANGUAGES

English  
Chinese  
Hindi  
Telugu  
Oriya  
Marathi

## 2022 (Feb)-2022 (Nov)

**ISSA Technology Co. Ltd, Taiwan.**

**Computer vision algorithm developer**

### **PROJECTS & RESPOSIBILITES:**

#### **SLEEP AND HEAD TRACKING DEVICE**

- Designed and built a drowsiness detection algorithm to monitor the driver's behaviour while driving, which has been optimized and implemented on the Jetson Nano and TX2.
- This model has been developed with the help of the mediapipe and PyTorch libraries, which immensely boost the performance of the model.

**Tech stack: Python, Mediapipe, NVIDIA edge device, opencv, Heroku, GitHub action**

#### **WAFER FAULT DETECTION**

- Developed a model for wafer fault detection and deploying it on the AWS Elastic Beanstalk platform for industrial purposes.
- A CI/CD pipeline has been setup with git action and the scheduling and orchestration of data pipelines designed with Apache Airflow.
- I have used different hypothesis tests, such as the ANOVA test and other T-tests for feature selection, which have improved the model's performance.
- The model has been developed and deployed on the cloud for industrial purposes with the help of Circle CI and Heroku.
- The goal is to build a machine learning model that predicts whether a wafer needs to be replaced or not (i.e., whether it is working or not) based on the inputs from various sensors.

## 2018-2022

**Zhen Ding Technology Co. Ltd, Taiwan.**

**Software & AI Development engineer**

### **PROJECTS & RESPOSIBILITES:**

#### **PCB DAMAGED BOARD CLASSIFICATION MODEL**

- I have built a classification model with the help of the KERAS library that separates the defective printed circuit boards from the good ones.
- This model has a reduced an error rate of 4% in the quality inspection of printed circuit boards.

#### **BUILDING AN DEFECT LOCALIZATION AND DETECTING MODEL**

- Developed an algorithm to localize the defects in PCBs using an object detection algorithm, leading to an accuracy of 99.41%, and increased the true positive rate by applying adaptive image scaling and non-maximum suppression to yolov5.
- Improved the precision of tiny defects on PCBs using RetinaNet 50 as a backbone. We are working on the application of YOLO model-agnostic meta-learning, a novel solution for few-shot object detection.
- Developed an interface for data collection, labelling, and testing using Tkinter.

#### **DESIGNED AN AUTOMATED MODEL FOR QUALITY INSPECTION**

- Designed an anomaly detection model for detecting defects on PCBs, which eventually reduced the computational cost for data labelling and data collection.
- This model was deployed on the Heroku cloud platform, and a CI/CD pipeline with Circle CI was designed for continued deployment of the model.

**Tech stack: Python, pytorch, Tensorflow, ML-flow, MLOps, Docker, CIRCLE CI**

## **PUBLICATIONS**

- **Unsupervised Anomaly Detection in Printed Circuit Boards through Student-Teacher Feature Pyramid Matching.**  
**LINK:**[https://pdfs.semanticscholar.org/3c22/ff4326bfd9b1ad2571e4ca026c23c8c401be.pdf?\\_ga=2.266354637.2112608243.1668403944-889865708.1668403944](https://pdfs.semanticscholar.org/3c22/ff4326bfd9b1ad2571e4ca026c23c8c401be.pdf?_ga=2.266354637.2112608243.1668403944-889865708.1668403944)
- **Applying deep learning to defect detection in printed circuit boards via a newest model of you-only-look-once.**  
**LINK:**[https://pdfs.semanticscholar.org/0530/9478457c8c9e8aeb8576c2fc519efade424e.pdf?\\_ga=2.34635490.2112608243.1668403944-889865708.1668403944](https://pdfs.semanticscholar.org/0530/9478457c8c9e8aeb8576c2fc519efade424e.pdf?_ga=2.34635490.2112608243.1668403944-889865708.1668403944)
- **Defect Detection in Printed Circuit Boards Using You-Only-Look-Once.**  
**LINK:**[https://pdfs.semanticscholar.org/cbda/82dee21e46af713e5b957da89c2e13440a89.pdf?\\_ga=2.87980763.2112608243.1668403944-889865708.1668403944](https://pdfs.semanticscholar.org/cbda/82dee21e46af713e5b957da89c2e13440a89.pdf?_ga=2.87980763.2112608243.1668403944-889865708.1668403944)
- **Detecting Defects in PCB using Deep Learning via Convolution Neural Networks.**  
**LINK:**<https://ieeexplore.ieee.org/document/8625828>