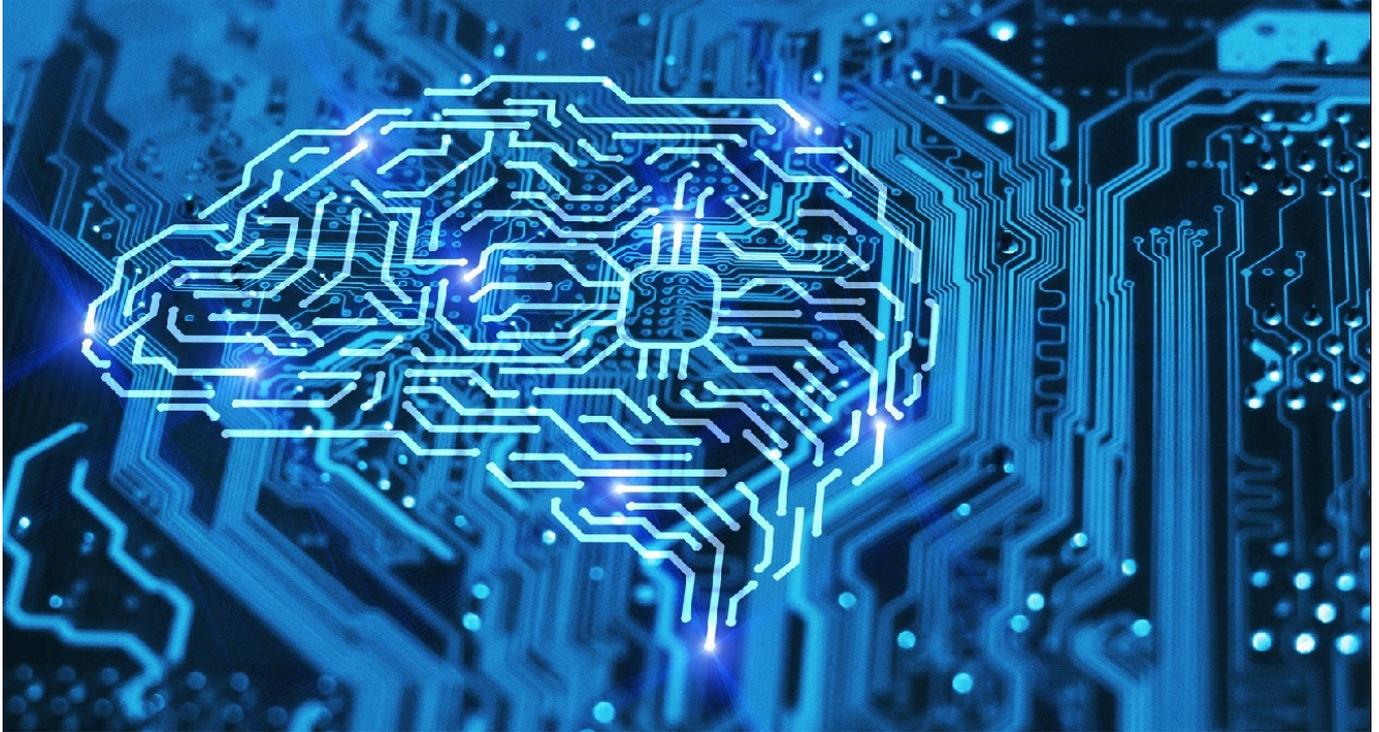TECH OFFER

End-To-End Ai Platform For Building Custom Computer Vision Capabilities

KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Video/Image Analysis & Computer Vision

TECHNOLOGY READINESS LEVEL (TRL): TRL8
COUNTRY: SINGAPORE
ID NUMBER: TO174379

OVERVIEW

Computer vision models are used in a suite of prediction tasks such as **Object Detection** and **Instance Segmentation** that have applications in a spectrum of deep-tech pillars such as Healthcare/Medical (detecting and diagnosing diseases from radiology or pathology images), Manufacturing (defect detection from image scans), Agritech (plant/crop health check via images and photos), and more. However, to accomplish this, teams have to navigate between Data Ingestion, Image Labelling, Transfer Learning, Model Validation, Deployment, and Model Tuning. This can take upwards of 8-12 different tools that teams have to use, making a swift, collaborative approach to model building a difficult task.

This technology offer presents an end-to-end MLOps platform that alleviates such issues and allows teams to build robust computer vision models step-by- step with enterprise-standard practices internally while maintaining a collaborative approach. This platform is industry agnostic, which provides an adaptive model that allows the teams and researchers to convert their datasets into working models.

TECHNOLOGY FEATURES & SPECIFICATIONS

Technology Feature

- **AI-Assisted Labelling**
  Most datasets are huge with complex geometries. The AI-Assisted Labelling capability within the platform's inbuilt annotator uses a mixture of contour analysis methods and deep-learning to label these datasets within a few clicks per image with pixel-level accuracy.
- **Image Augmentation**
  Generate synthetic variations of the datasets directly in the platform to build a robust computer vision model
- **Multi Architecture Included / Multi-GPU Support**
  Performing fine-tuning or transfer learning on MaskRCNN / FasterRCNN models with a large batch size may require multiple GPUs calculating gradients simultaneously. The platform handles the cloud orchestration of these configurations and supports more than 30 model architectures.
- **Evaluation and Report Generation**
  All model training comes paired with a detailed evaluation result and statistical analysis of the model that can be included as part of the publication or technical specification sheet.
- **Industry Agnostic**
  The process is industry agnostic and deals with most 2D image types (RGB, PNG, etc) - The platform has success in computational pathology, manufacturing, and inspection use cases.

General Specifications

- Works on 2D RGB Images (or converted from other spectrums)
- Supports Polygon, Bounding Box, Mask Labels
- Supports Most Neural Network Architectures (FasterRCNN, EfficientDet, MaskRCNN, MobileNet, etc)

POTENTIAL APPLICATIONS

The platform is generally industry agnostic and seeks to provide the workflow, computation resources and standards for teams to build models for their own contexts. This platform can be used by both AI service providers, companies looking to automate processes, as well as researchers looking to bring their datasets into production. The following are use cases that have been tested with our partners, but are not limited to -

Computational Pathology and Medical Imaging

- Disease Detection and Identification (Tumour Lesion, Fracture, Foreign Objects)
- Anomaly Detection

Manufacturing

- Multi-Class Materials Defect Detection (Semiconductors, Materials, Fabrication QA, etc)
- Assembly Parts Identification and Counting
- Workforce Safety Monitoring via CCTV (safety gear checking, crowding, etc)

Agriculture and Food Technology

- Crops and Food Grading
- Crops / Trees Counting from Aerial Imagery
- Farm Plot Management
- Automated Food Inspection

Others

- Security Use Cases such as automated screening, object detection in x-ray scans, human counting / tracking
- Construction Site Management
- Smart City Use Cases (Human Monitoring, Crowd Controls, Carpark Capacity Scanning System)

MARKET TRENDS & OPPORTUNITIES

There's a staggering 250,000 shortage of ML / AI engineering talents with 83% of companies investing in big data projects. The computer vision market size is valued at USD10.6B in 2019 and is expected to grow at a compound annual growth rate of 7.6%. However, looking at MLOps, which is predicted to be worth $4 billion by 2025 (worth only $350 Million in 2019) - has a CAGR of about **50%**. This means that more and more companies who are moving into AI and Machine Learning are starting to focus on actual data processes, model lifecycles, and the deployability of the models.

BENEFITS

This platform covers demographics in industrial, deep-tech problem solvers, and researchers. The platform provides the team with the in-house capability to build a robust model that is robust and production-ready. Using the platform, teams are equipped with an advanced MLOps pipeline that provides both speed and cost benefits when developing computer vision capabilities. Finally, the web-based and "batteries-included" approach of the platform means that users need not write complex code or environment setup to get involved.