

## TECH OFFER

### Ai-Assisted Image Labelling Tool For Large Scale Data Labelling Efficiency



## KEY INFORMATION

### TECHNOLOGY CATEGORY:

Infocomm - Video/Image Analysis & Computer Vision

Infocomm - Artificial Intelligence

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174776**

## OVERVIEW

Image annotation is a critical step in developing computer vision and image recognition systems. Image annotation can be used in 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. As a result, image annotation is critical in developing Artificial Intelligence/ Machine Learning (AI/ML) models in a variety of fields.

The role of image annotation in deep learning has changed over time. Today, image annotation has become more important for object recognition with new characteristics and capabilities in real-world settings. However, manual labeling of complex objects continues to be time-consuming, tedious, and error-prone - additionally, outsourcing these labeling tasks might not always be the best way due to domain-expertise required in labeling complex image data e.g. radiography images or surface defects on semiconductors.

This technology offer is an AI-assisted image labelling tool that enables technical teams to collaboratively, quickly, and easily label large image datasets with pixel-level accuracy masks. As the tool is industry agnostic, it can be used by any industry with a minimal learning curve.

The technology owner is keen to work with companies who are looking to build out datasets / ground-truths / and labels for building deep-learning experiments and capabilities, through R&D collaboration and licensing opportunities.

## TECHNOLOGY FEATURES & SPECIFICATIONS

The features of this technology are as follows:

- **AI-Assisted Labelling**  
Most datasets are huge with complex geometries. The AI-Assisted labelling feature within the tool uses a mixture of contour analysis methods and deep-learning to label these datasets within a few clicks per image with pixel-level accuracy. Users just need to click on the area of interest and the corresponding masks around the object of interest will be automatically generated.
- **Industry Agnostic**  
The image labelling process is industry agnostic and works with most 2-dimensional (2D) RGB image types (JPG, PNG, etc) - the tool has already been used 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
- Exportable to major annotation formats e.g. COCO JSON, LabelMe, PascalVOC, COCO MASK, CSV Width-Height, etc
- Supports immediate model training with MaskRCNN, DeepLabV3 with "One-Click Train" feature

## POTENTIAL APPLICATIONS

One of the issues faced by researchers, machine learning, and data scientists is that labeling data can be tedious and time-consuming. The tool seeks to help them label data much faster - using only a few clicks to generate near pixel-perfect masks for your data. Teams have been able to label thousands of medical images within a week using our automated segmentation algorithm and fully-online tool to improve collaboration amongst the labeling team and supervisors.

### Computational Pathology and Medical Imaging

- Disease Detection and Identification (Tumour Lesion, Fracture, Foreign Objects) from X-Ray / MRI Machines
- Anomaly Detection in Blood Cell Scans / Pathology Scans

### Manufacturing

- Multi-Class Materials Defect Detection (Semiconductors, Materials, Fabrication Quality Assurance, etc)
- Assembly Parts Identification and Counting
- Material Defects Labeling
- Cracks / Rust / Anomaly Labelling from X-Ray / RGB Images

## Agriculture and Food Technology

- Crops and Food Grading
- Crops / Trees Labeling
- Food Inspection Data Labeling

## Others

- Construction Site Management
- Smart City Use Cases (Human Monitoring, Crowd Controls, Carpark Capacity Scanning System)

## MARKET TRENDS & OPPORTUNITIES

The global data annotation tools market size was valued at USD 629.5 million in 2021 and is anticipated to expand at a compound annual growth rate (CAGR) of 26.6% from 2022 to 2030. The growth is majorly driven by the increasing adoption of image data annotation tools in the automotive, retail, and healthcare sectors - the demand for annotation tools is soaring because of the need to reinforce the value of data in these industries.

Additionally, the global data collection and labeling market size was valued at USD 1.67 billion in 2021 and is expected to expand at a compound annual growth rate (CAGR) of 25.1% from 2022 to 2030. The market is expected to witness a surge in the adoption of the technology owing to benefits such as extracting business insights from socially shared pictures and auto-organizing untagged photo collections. It also contributes to developing enhanced safety features in autonomous vehicles, such as condition monitoring, terrain detection, wear detection, and emergency vehicle detection. Machine Learning has been incorporated in various industries, including facial recognition on social networking websites, automated picture arrangement on visual websites, and robotics and drones.

## UNIQUE VALUE PROPOSITION

- Helps teams label data much faster - an AI-enabled segmentation tool that uses only a few clicks to generate pixel-perfect masks for your data.
- Completely online, no additional plug-ins are required - labelling is done in a web browser, and can be performed collaboratively within the team or with an offshore workforce
- Medical data for example, require years of expertise to label correctly - this tool allows professionals such as doctors, and researchers to label data 10 times faster.
- Does not require learning any proprietary software (minimal learning curve)
- Allows teams to quickly train powerful AI models after data-labeling for an end-to-end workflow as images are taken as inputs, and trained deep-learning models are generated as outputs (FasterRCNN, MaskRCNN, DeepLabV3, YOLO etc)
- Supports the generation of labeled files for multiple popular frameworks