

Abstract

Cell confluency is a biological measurement for determining the density area of the cells that attach to the vessel surface. Cell confluency is beneficial in keeping the cells safe to grow properly and giving information related to the growth phase of the cells and the cells' biomass. Cell confluency is manually counted using a light microscope. However, light microscopy cell counting analyses are proven to be ineffective and not consistent. Thus, ImageJ is used as the other alternative method to calculate the cells digitally. On the other hand, it is also found that ImageJ is not suitable for cell confluency analysis due to lack of credibility and limitations in handling halo cell effects and cell & background color similarities. So, this project aims to create AI training with supervised learning using YOLO AI and CVAT labeling, which is stored in the website application of the Streamlit framework system. From the results, the medium segmentation and mixed annotation show the best result with around 0.6 mAP. In addition, the second hypothesis of the experiment was accepted, and the AI needs to have an update, such as background labeling & contamination introduction, due to poor training, failure in some parameters, and not fulfilling user expectations.

Keywords: cell confluency, yolo ai, website application