Image processing coding contest
Workflow ideas

Contest dates: Oct. 30th – 16 Nov. 2018

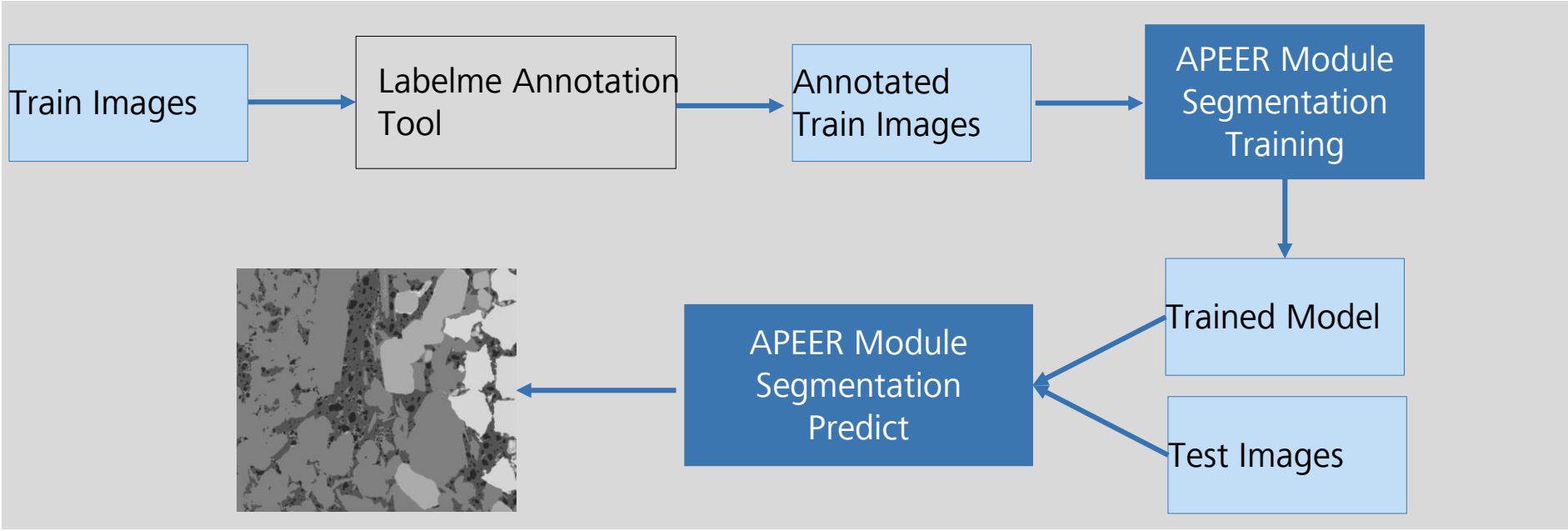
Idea 1: Segmentation Workflow

The task is to create two APEER modules:

1. A module that allows to train a segmentation algorithm (e.g. Deeplab) on any kind of image set and that returns the trained model
2. A module that uses the trained model to segment test images

Note: The data annotation can be done with an external open source tool, such as labelme

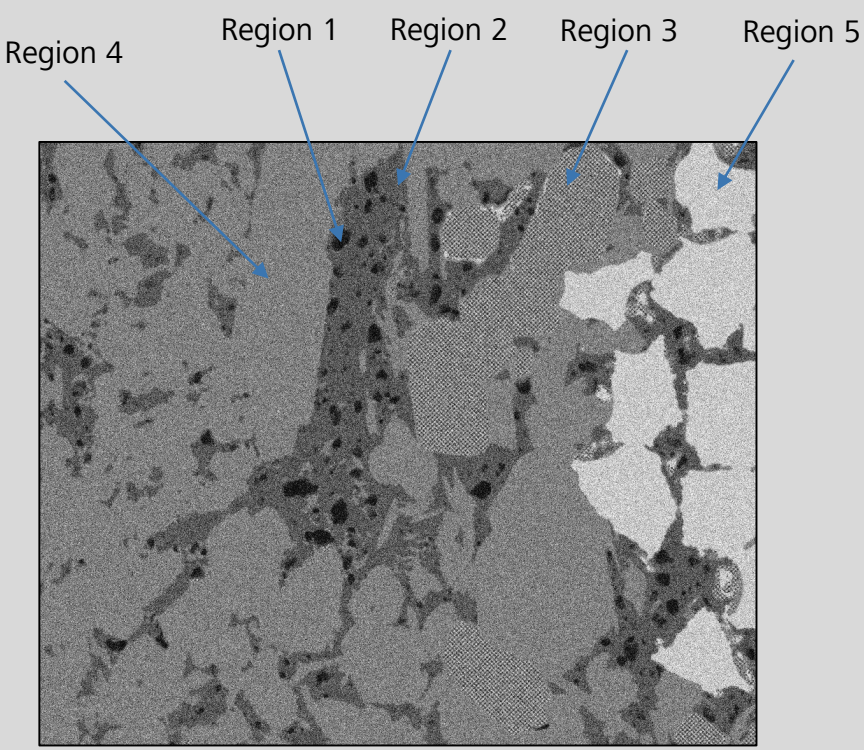
Example dataset information is given on the following page.



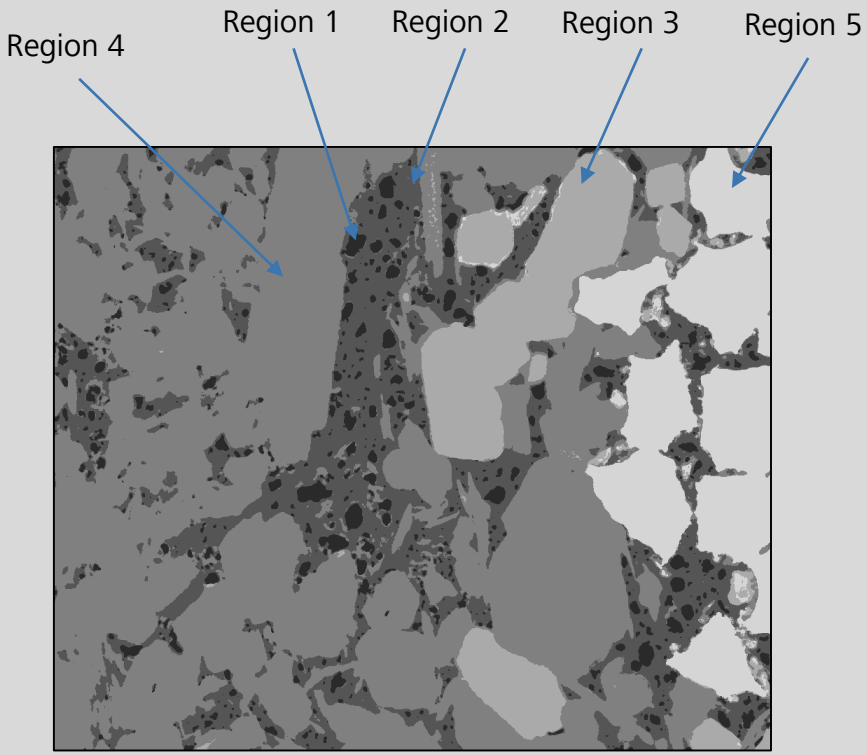
Idea 1: Segmentation Workflow
Example dataset information

Download the file from: https://spaces.hightail.com/space/7m0BHiVOqs

Tiff stack with 606 images in the series (509 MB)
Contains 5 different regions that need to be segmented
Region 3 has synthetic texture



Images to be segmented



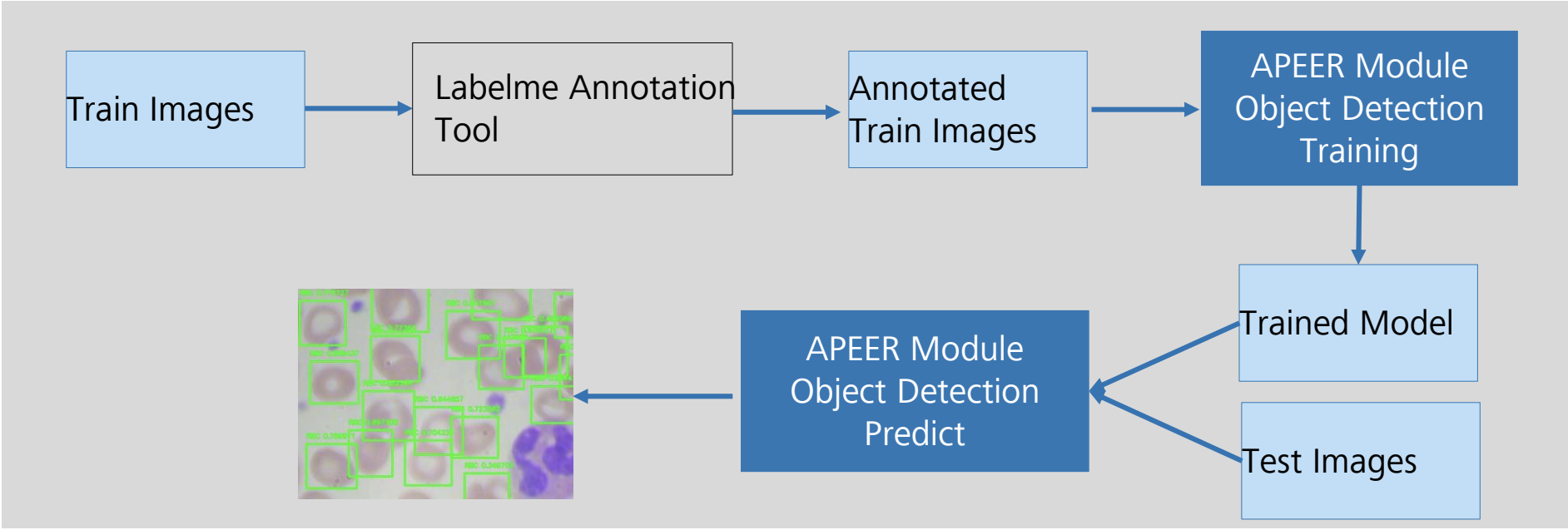
Example segmented mage

Idea 2: Object Detection Workflow

The task is to create two APEER modules:

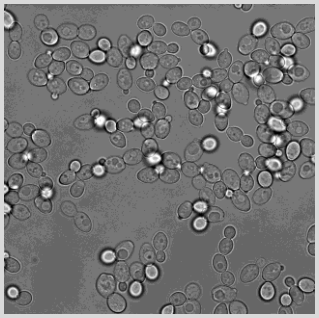
1. A module that allows to train an object detection algorithm (e.g. Yolo from Darknet or the Tensorflow Object Detection API) on any kind of image set and that returns the trained model
2. An APEER Module that uses the trained model to detect objects in test images

Note: The data annotation can be done with an external open source tool, such as VOTT or labelimg

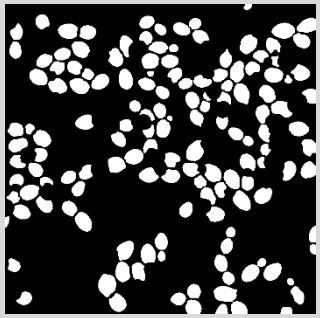


Other Ideas: Any workflow of your choice that automates a current manual workflow

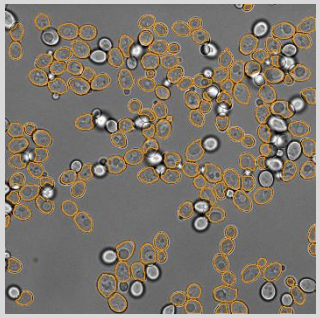
Here is one of the example workflows from APEER. This workflow automates the process of detecting, sizing, and plotting the dimensions of individual yeast cells in a microscope image.



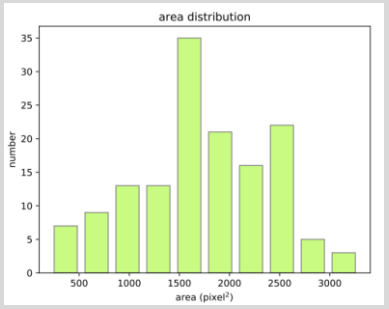
Input image of yeast cells collected on a microscope



Tensorflow based object recognition algorithm to identify individual yeast cells



Python code to measure individual yeast cell dimensions

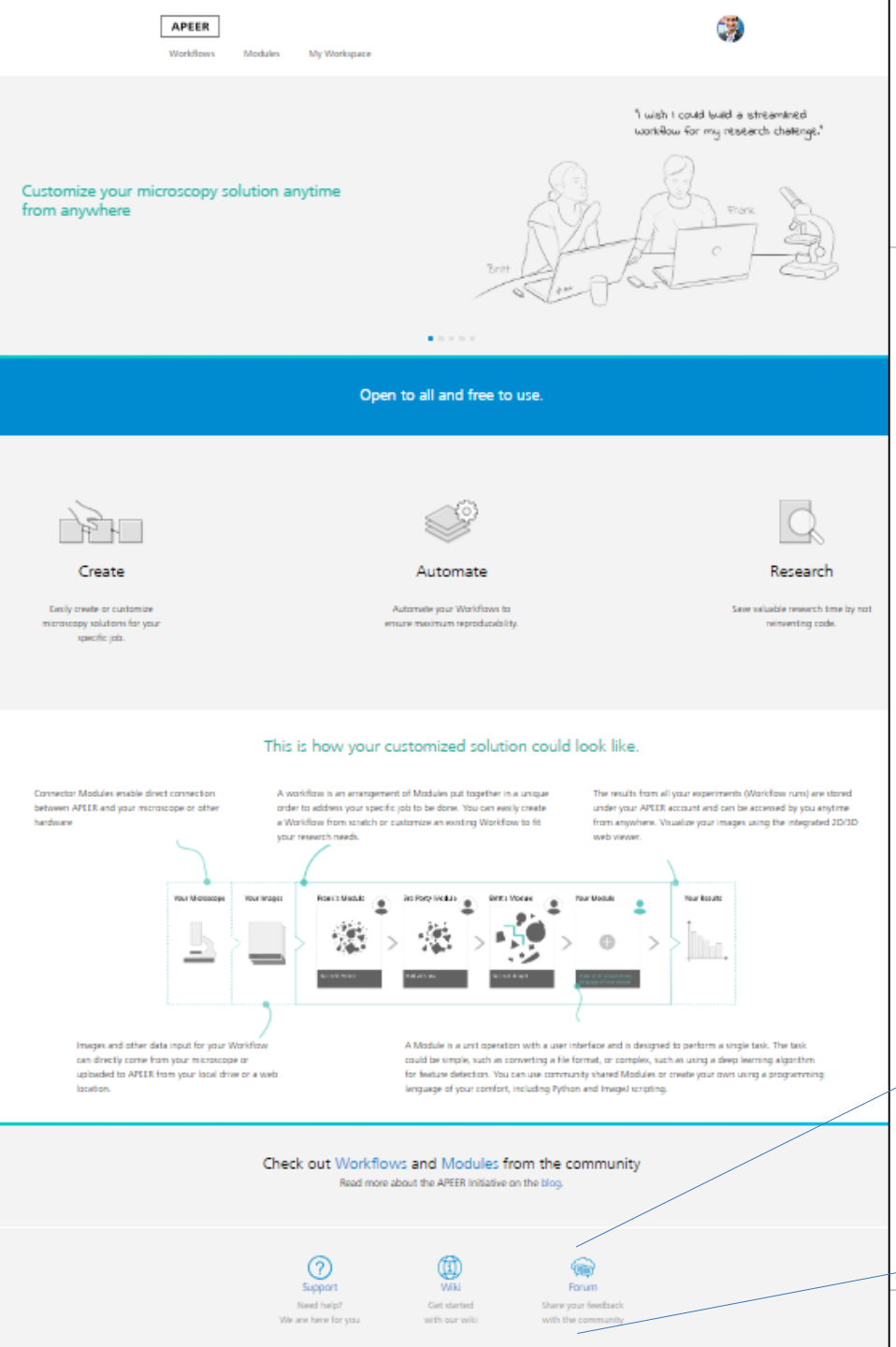


Plotting of yeast cell dimensions

NOTE: Do not work on this exact workflow as it already exists on APEER. The description is for example purposes only.

Other potential workflow examples include:

- Deep learning based tumor detection
- Mitosis detection in histology images
- Segmentation of pores (or other features) in 3D microscopy images of battery materials, reservoir rocks, 3D printed components, etc.
- Separation of circular vs non-circular features
- Or any other image processing workflow up to your imagination!



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Forum

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