

Contribution ID: 14

Type: **Talk**

# Distributed image analysis services using MicroDraw

*Thursday 23 September 2021 15:15 (15 minutes)*

Analysis of histological data requires sophisticated methods and tools. In the past, research teams have aimed at producing tool packages covering all researchers' needs. Such large packages can quickly become unwieldy: difficult to maintain and complex to use. Web technologies allow for a powerful alternative: focused micro-services. Instead of a single, overly complex tool, users can rely on a variety of small tools, easier to develop, easier to understand, each aiming at solving a single problem in an efficient manner. For the same problem, different users may have the possibility of picking the tool that is the most appropriate to their working style.

We demonstrate the possibility of creating such services using MicroDraw, a Web app for the collaborative annotation of high resolution histological datasets (<https://microdraw.pasteur.fr>). We developed a website implementing an external service for segmenting histological data using a random forest classifier. A series of sample regions can be delineated in MicroDraw, and fetched by our service. The website uses Pyodide, allowing us to run Python machine learning code in the web browser. We used Scikit-image for extracting image features, and Scikit-learn for the classification algorithm. The regions used to train the classifier are adjusted iteratively to optimise the segmentation, and applied automatically to a series of images of the same type. The results are finally vectorised and sent back to MicroDraw. More generally, the same procedure could be used with different machine learning or deep learning algorithms, facilitating the interconnection of different services, fostering distributed collaboration.

**Primary authors:** Dr TORO, Roberto (Institut Pasteur); HEUER, Katja (Institut Pasteur); TRAUT, Nicolas (Institut Pasteur)

**Presenters:** Dr TORO, Roberto (Institut Pasteur); HEUER, Katja (Institut Pasteur); TRAUT, Nicolas (Institut Pasteur)

**Session Classification:** Contributed Talks: Applications

**Track Classification:** Workshop Day 2 - Sep 23: Applications