



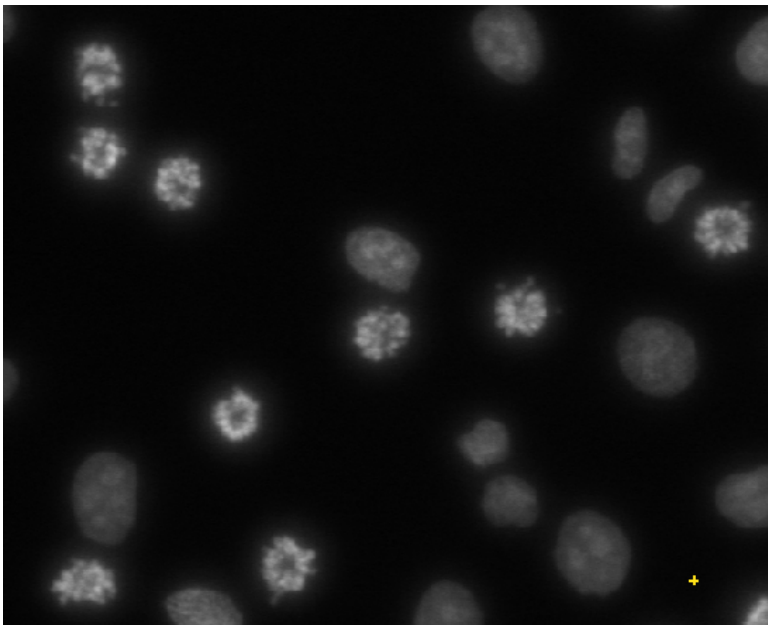
QLS Breakfast

Alvin(Ziqi) Lu

Di Talia lab

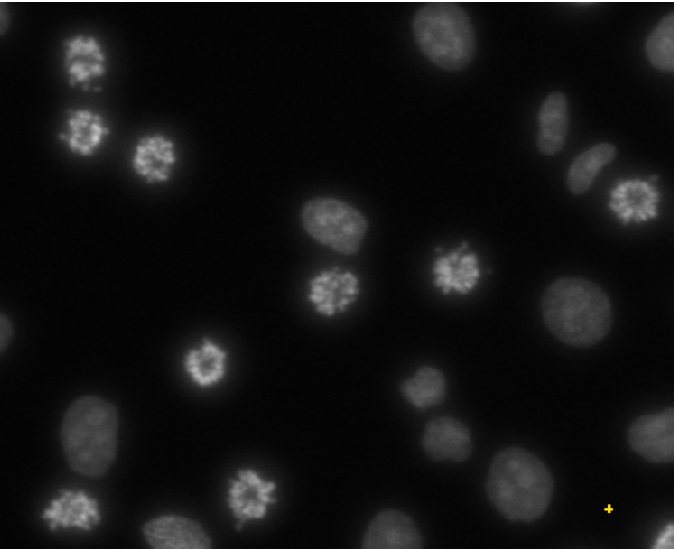
02/21/2024

Goal of Biological Image Processing

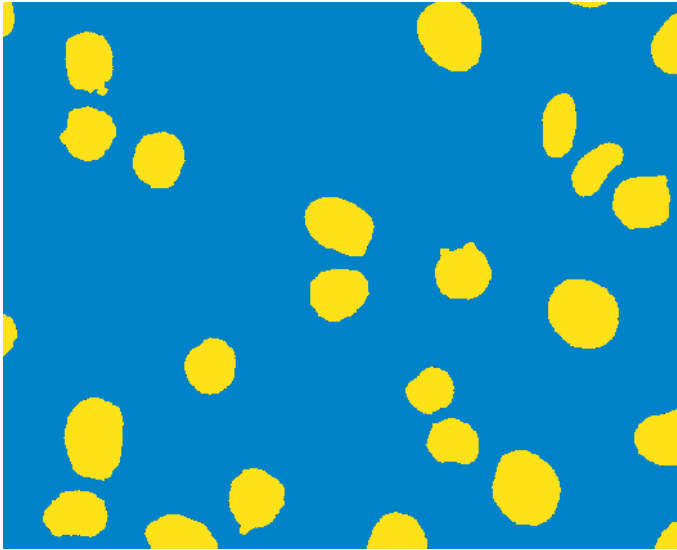


	Cell type	Position	Size	Intensity_C1	Intensity_C2	...
Cell1						
Cell2						
...						

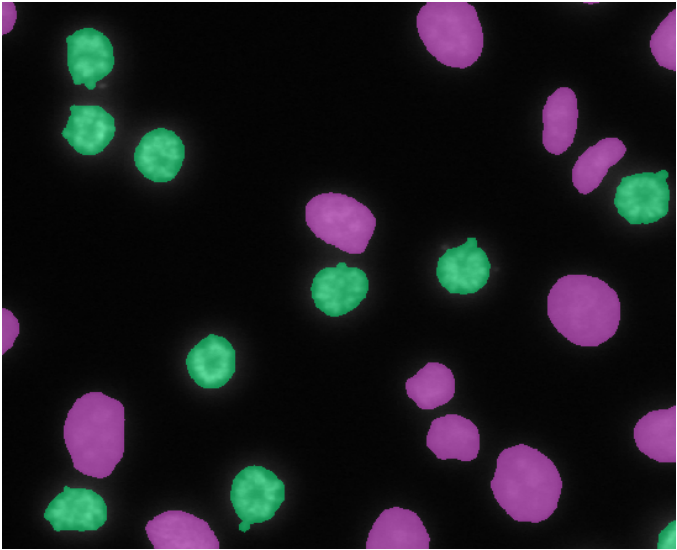
Goal of Biological Image Processing



Foreground/background



Biological objects



	Cell type	Position	Size	Intensity_C1	Intensity_C2	...
Cell1						
Cell2						
...						



ilastik the interactive learning and segmentation toolkit

Leverage machine learning algorithms to easily segment, classify, track and count your cells or other experimental data. Most operations are interactive, even on large datasets: you just draw the labels and immediately see the result.

No machine learning expertise required.

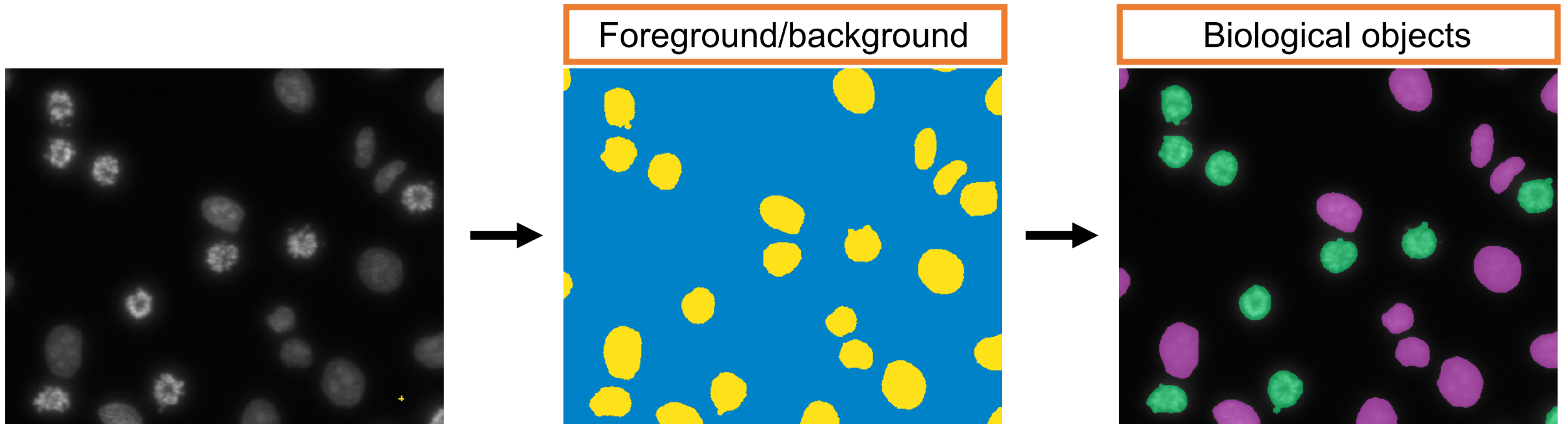


ilastik the interactive learning and segmentation toolkit

Leverage machine learning algorithms to easily segment, classify, track and count your cells or other experimental data. Most operations are interactive, even on large datasets: you just draw the labels and immediately see the result.

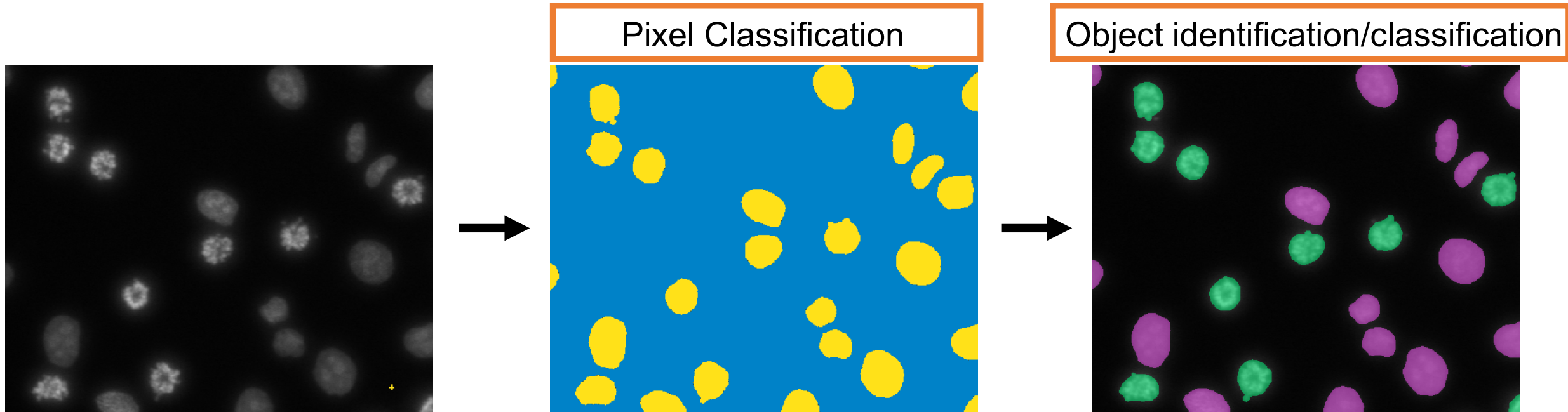
No machine learning expertise required.

What does Ilastik do?



	Cell type	Position	Size	Intensity_C1	Intensity_C2	...
Cell1						
Cell2						
...						

What does Ilastik do?



	Cell type	Position	Size	Intensity_C1	Intensity_C2	...
Cell1						
Cell2						
...						

What does Ilastik do?



Documentati

Overview

- User documentation
- Developer documentation

ILASTIK BASICS

[Installation](#)
[ilastik FIJI plugin](#)
[Startup screen](#)
[Data Selection](#)
[Data Navigation](#)
[Layers](#)
[Exporting Output](#)
[Batch Processing](#)
[Headless Operation](#)
[FAQ / Common Problems](#)
[Performance tips](#)

ILASTIK WORKFLOWS

[Neural Network Classification](#)
[Pixel Classification](#)
[Trainable Domain Adaptation \(beta\)](#)
[Voxel Segmentation Workflow \(beta\)](#)
[Autocontext](#)
[Object Classification](#)
[Boundary-based Segmentation with Multicut](#)
[Tracking](#)
[Density Counting](#)
[Carving](#)
[IIBoost Synapse Detection](#)

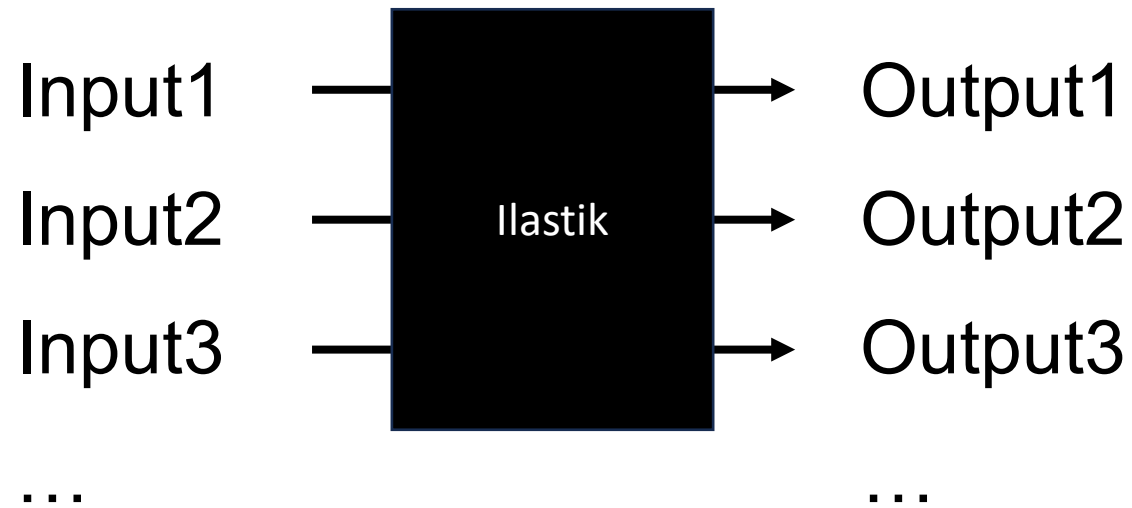
USE CASES

[Animal Tracking](#)

How does Ilastik do it?

Pixel Classification

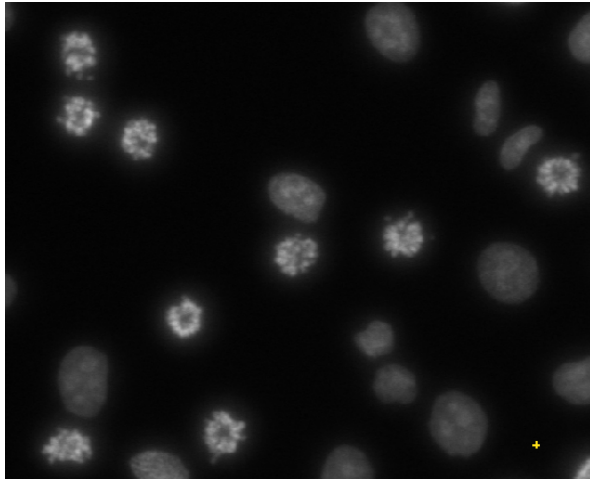
Object Classification



How does Ilastik do it?

Pixel Classification

Object Classification

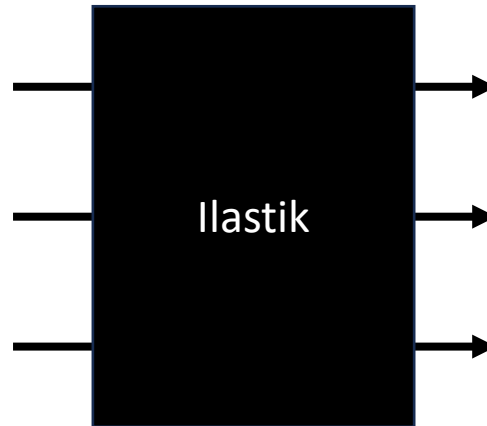


Pixel1

Pixel2

Pixel3

...

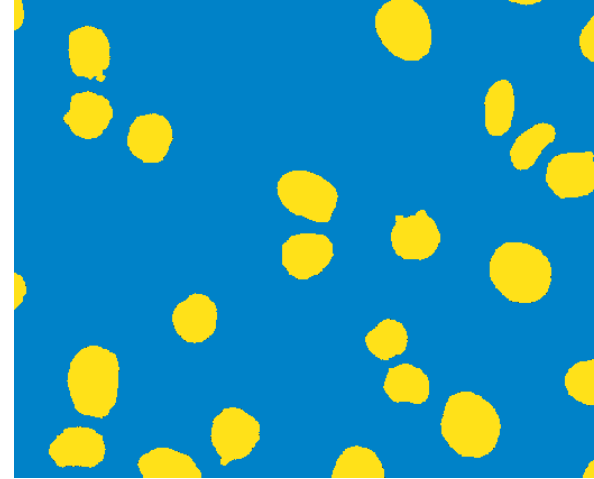


Foreground

Background

Background

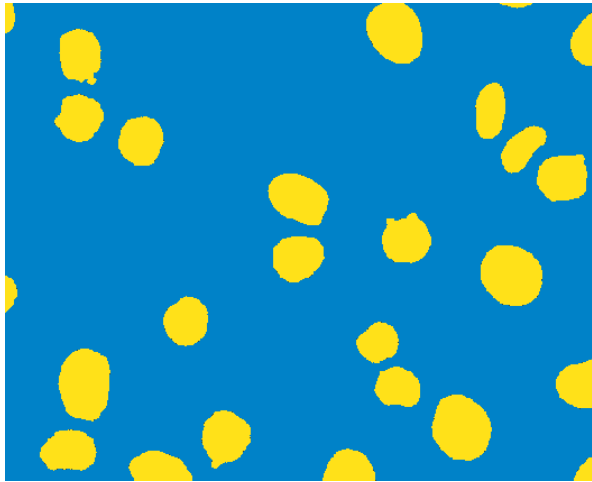
...



How does Ilastik do it?

Pixel Classification

Object Classification

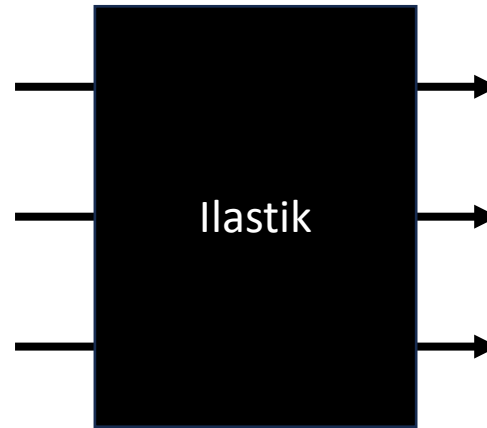


Cell1

Cell2

Cell3

...

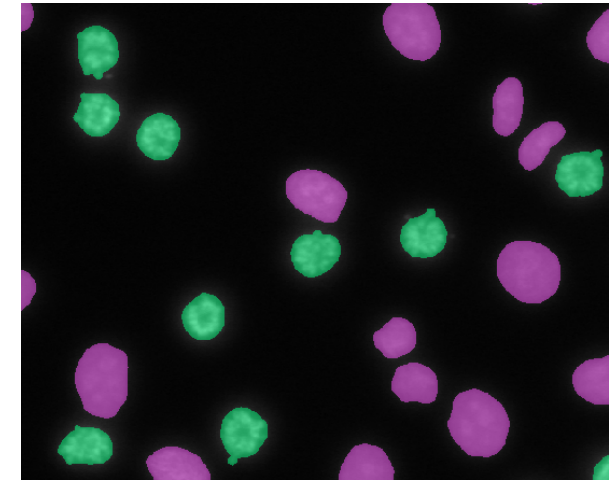


Cell type1

Cell type2

Cell type1

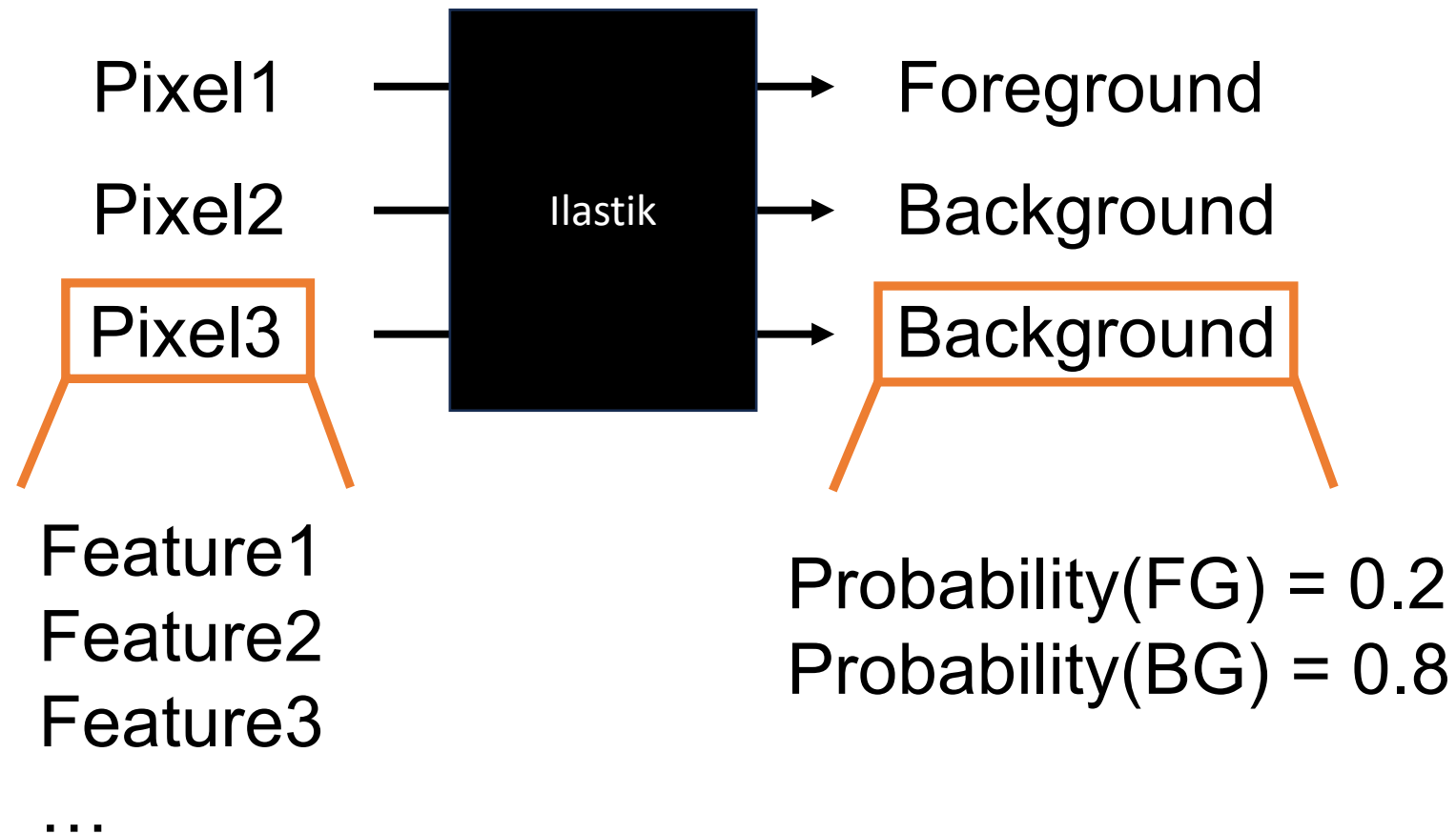
...



How does Ilastik do it?

Pixel Classification

Object Classification



How does Ilastik do it?

Pixel Classification

Object Classification

Pixel1

Pixel2

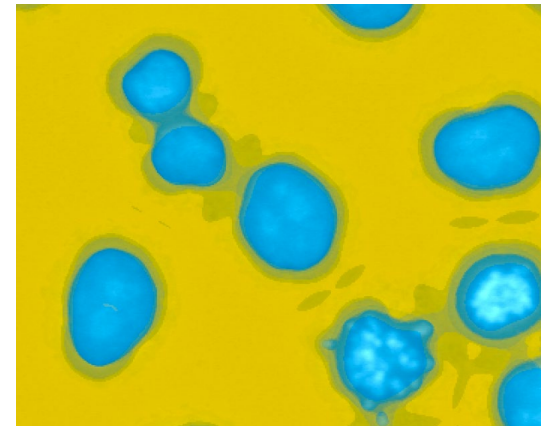
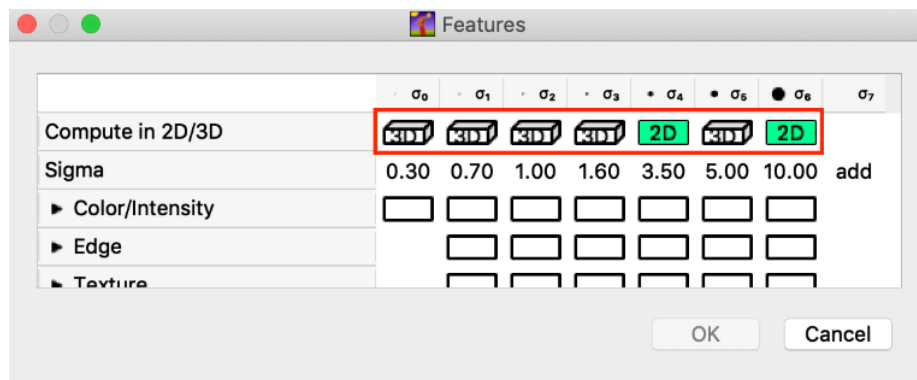
Pixel3

Ilastik

Foreground

Background

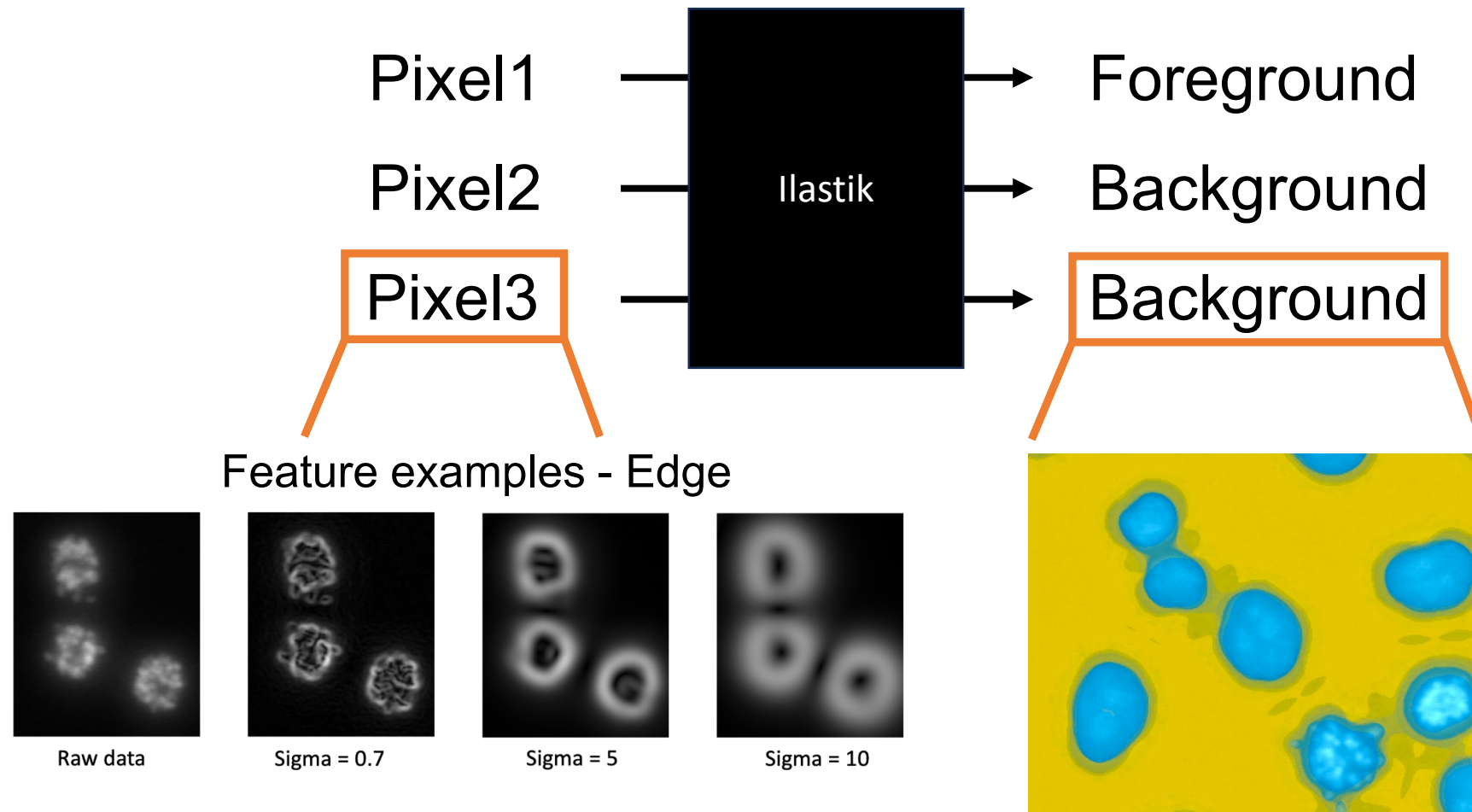
Background



How does Ilastik do it?

Pixel Classification

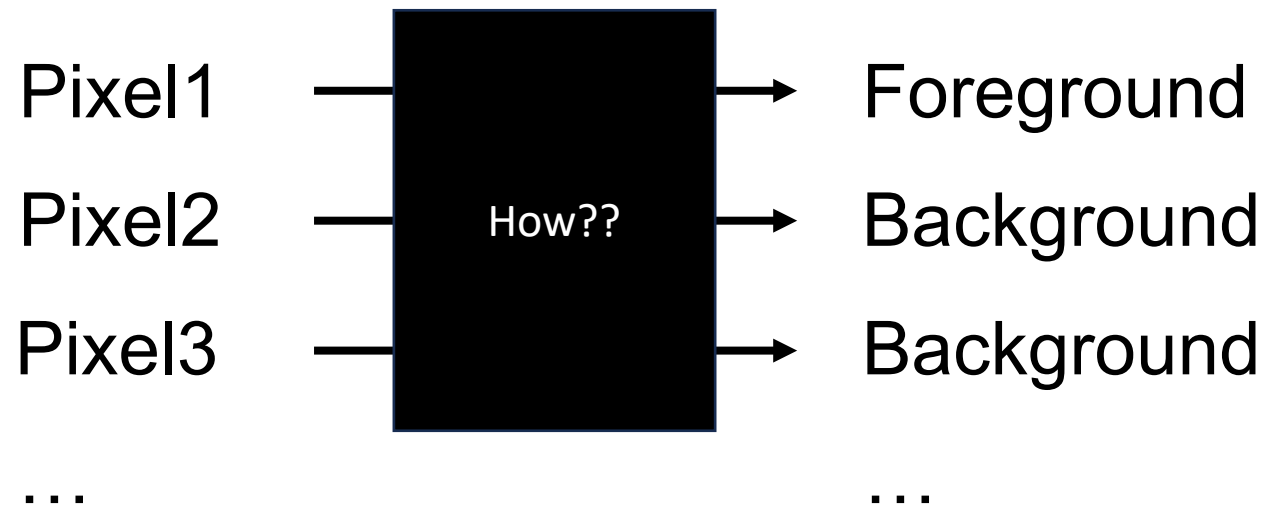
Object Classification



How does Ilastik do it?

Pixel Classification

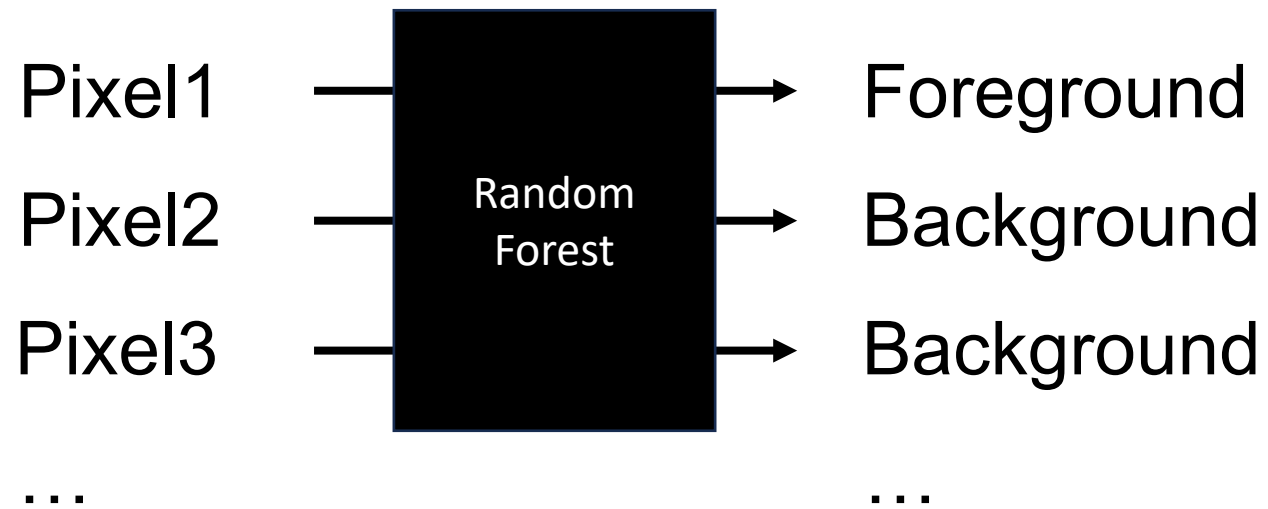
Object Classification



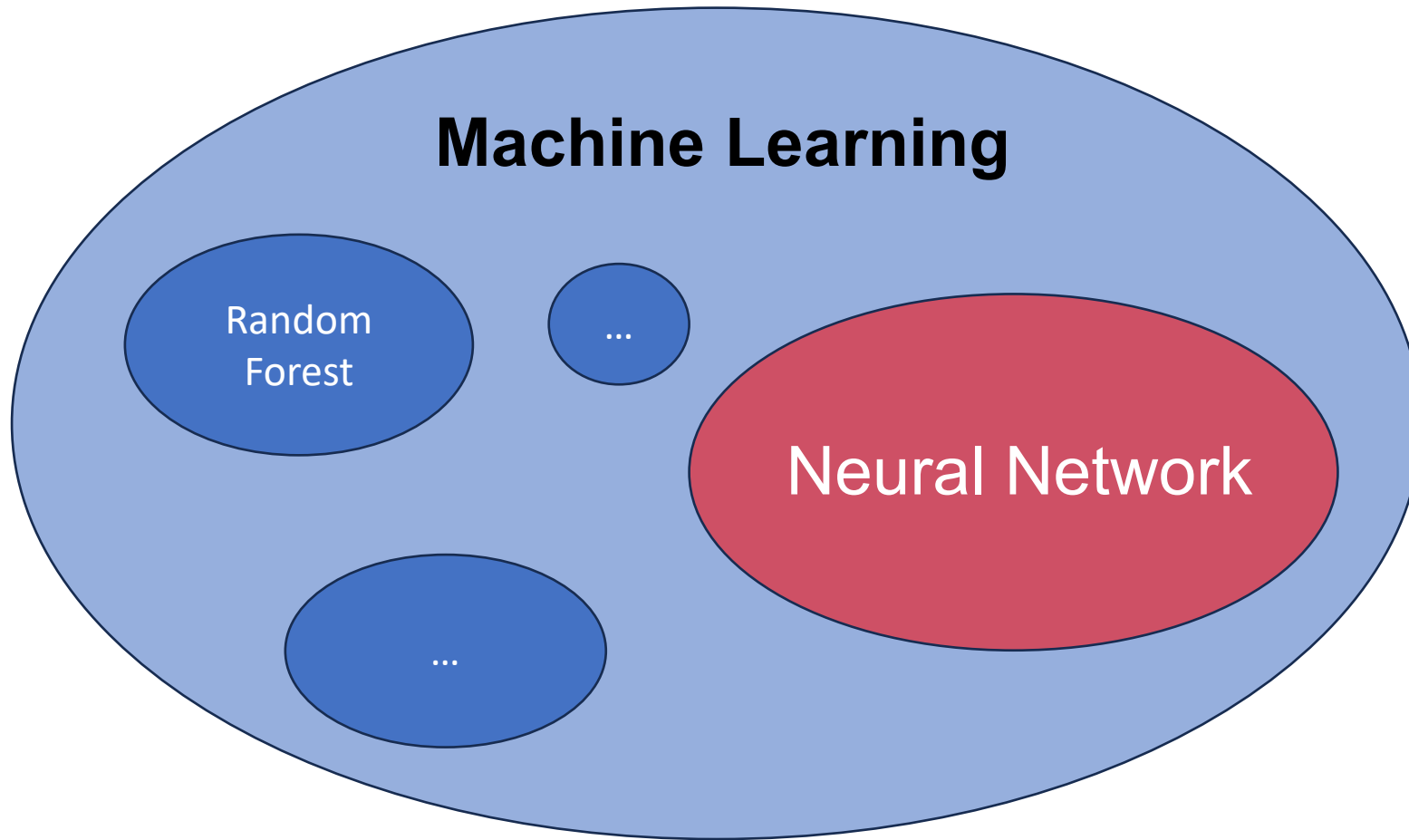
How does Ilastik do it?

Pixel Classification

Object Classification



How does Ilastik do it? – Random Forest



Random Forest is made of Decision Trees

Input features:

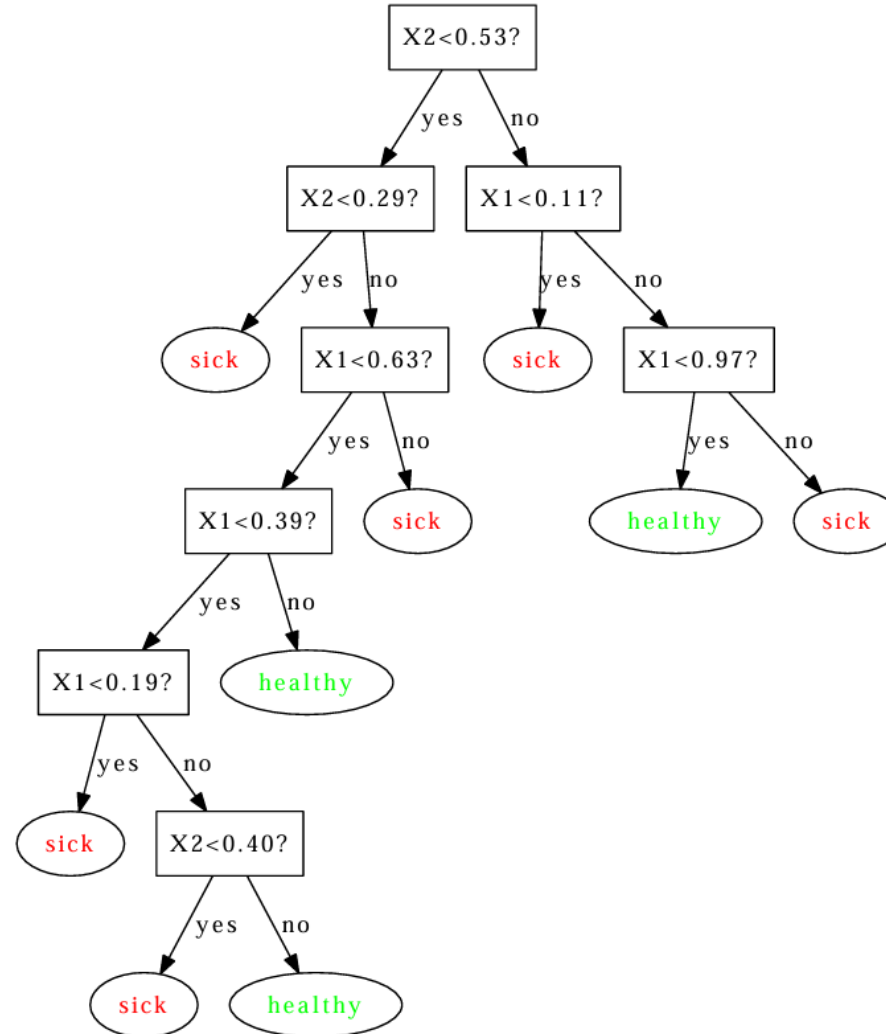
X1: Intensity of Channel1

X2: Intensity of Channel2

Output classes:

Healthy Cells

Sick Cells



Random Forest is made of Decision Trees

Input features:

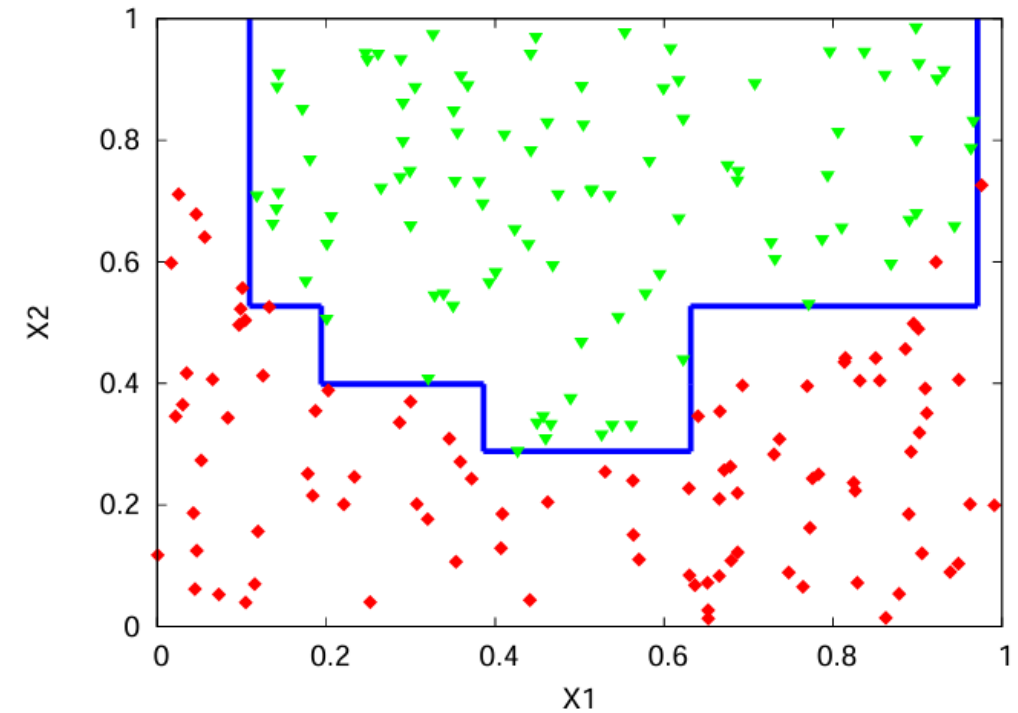
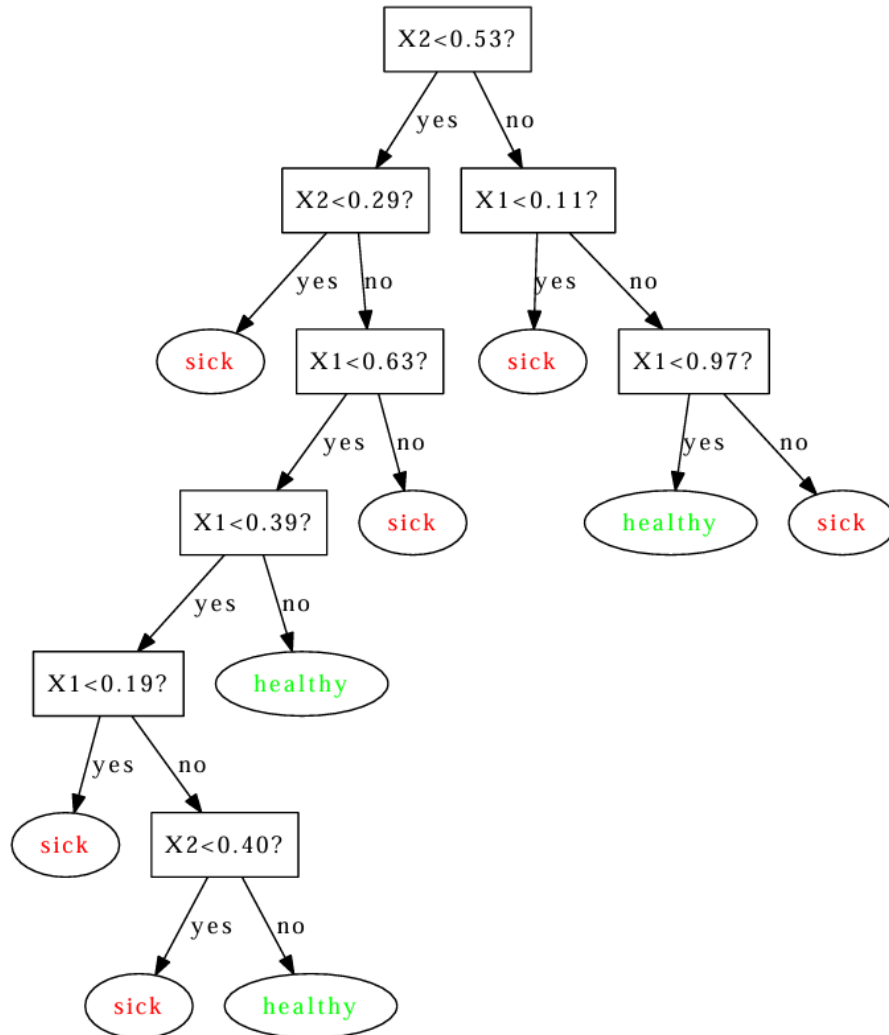
X1: Intensity of Channel1

X2: Intensity of Channel2

Output classes:

Healthy Cells

Sick Cells



Random Forest is made of Decision Trees

Input features:

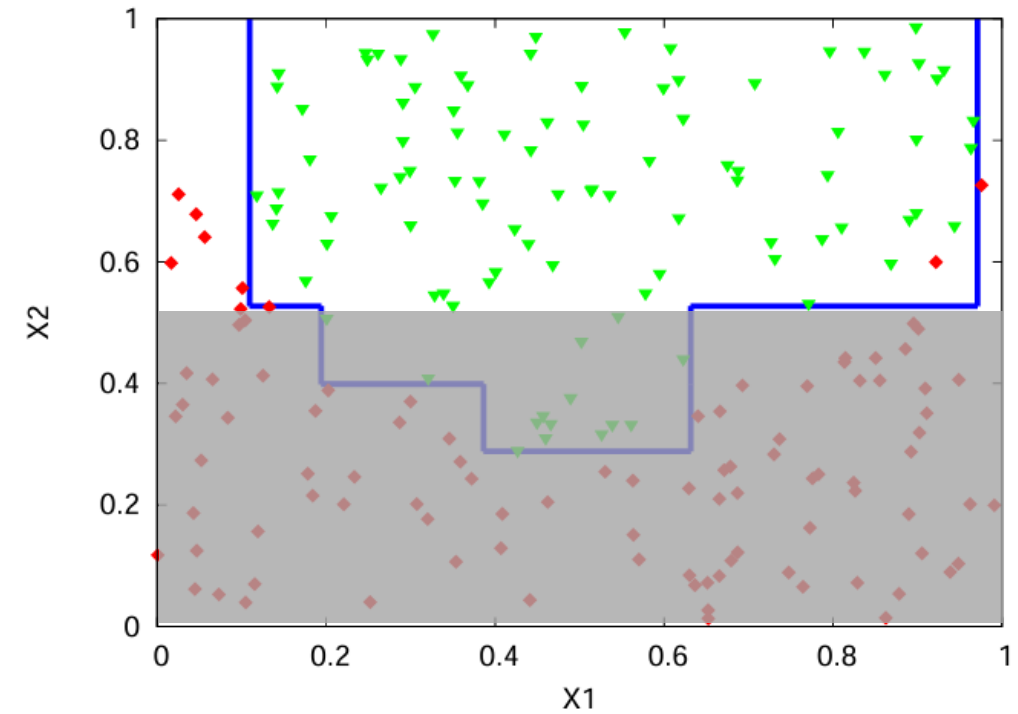
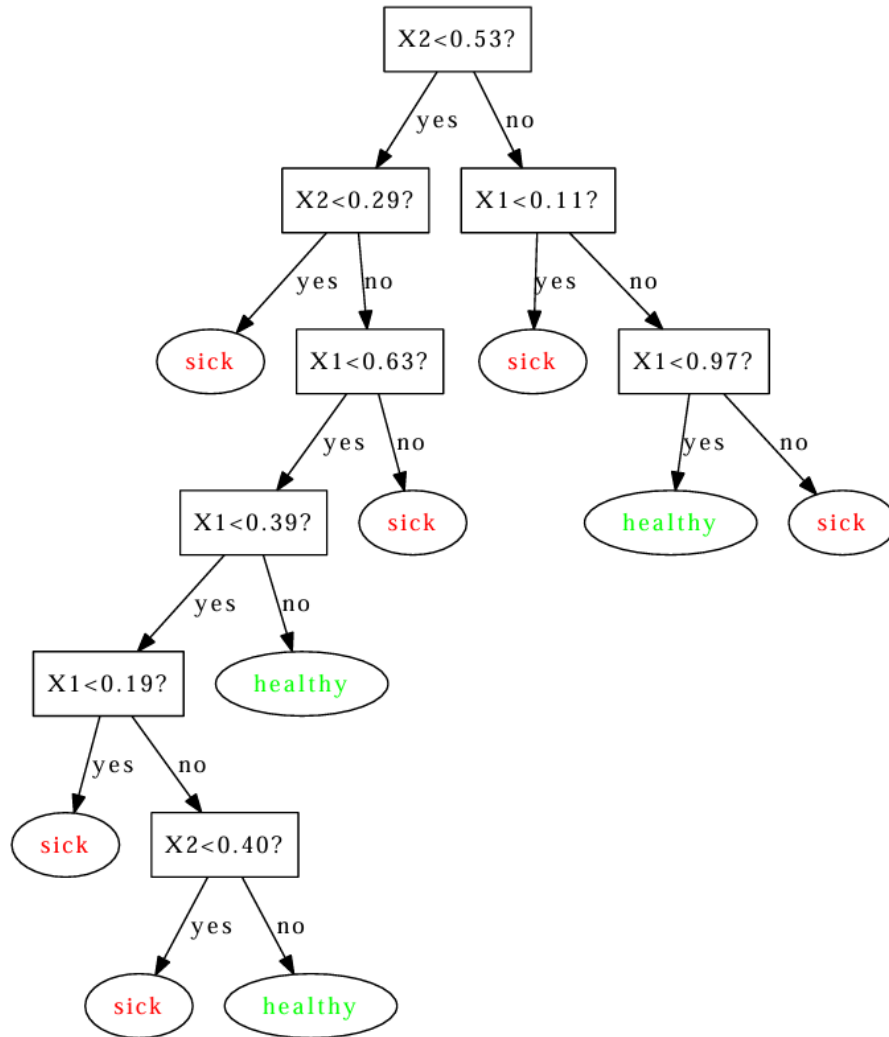
X1: Intensity of Channel1

X2: Intensity of Channel2

Output classes:

Healthy Cells

Sick Cells



Random Forest is made of Decision Trees

Input features:

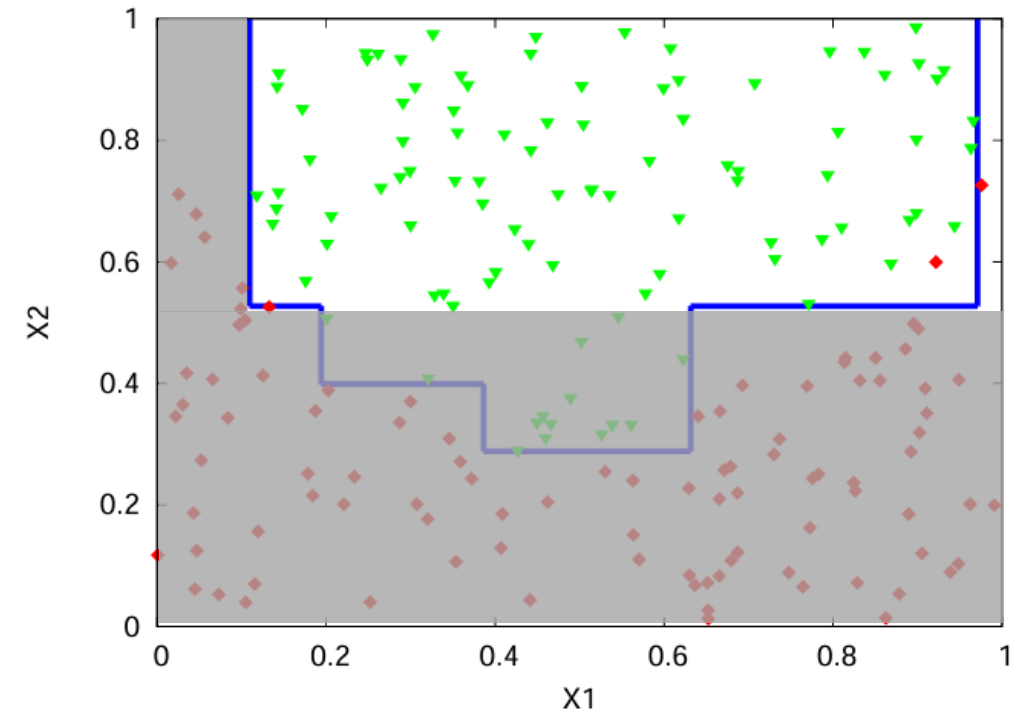
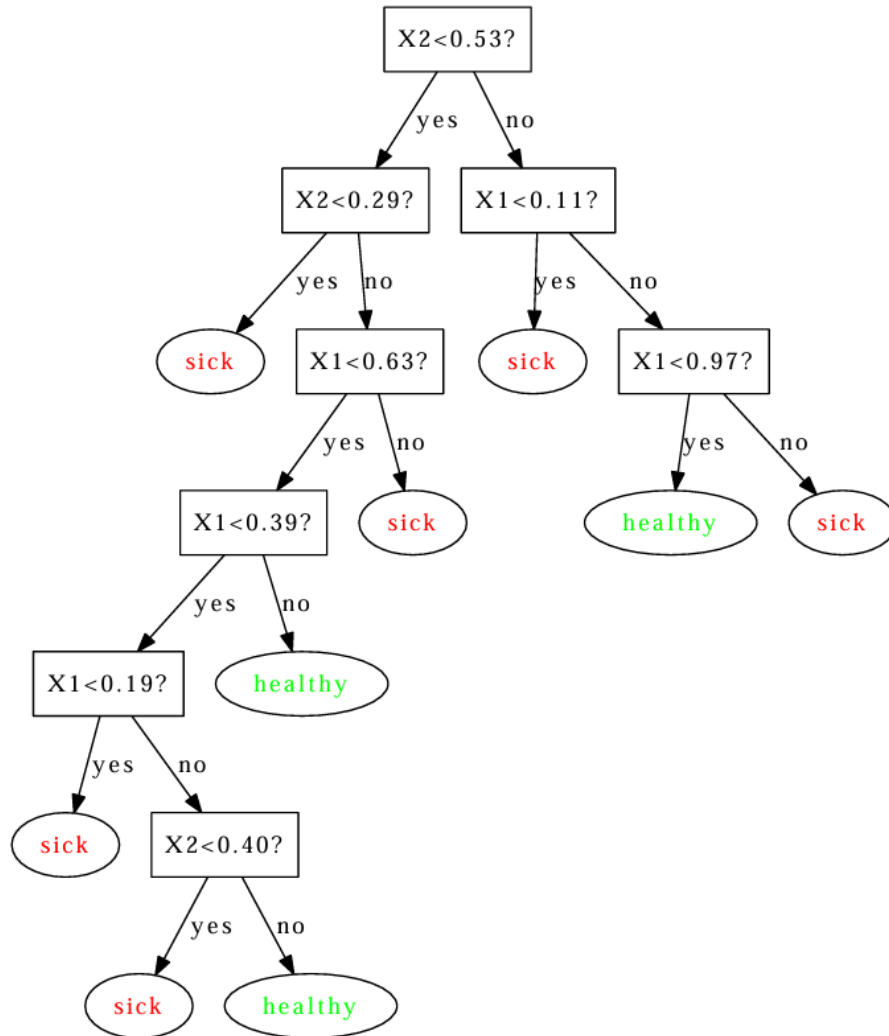
X1: Intensity of Channel1

X2: Intensity of Channel2

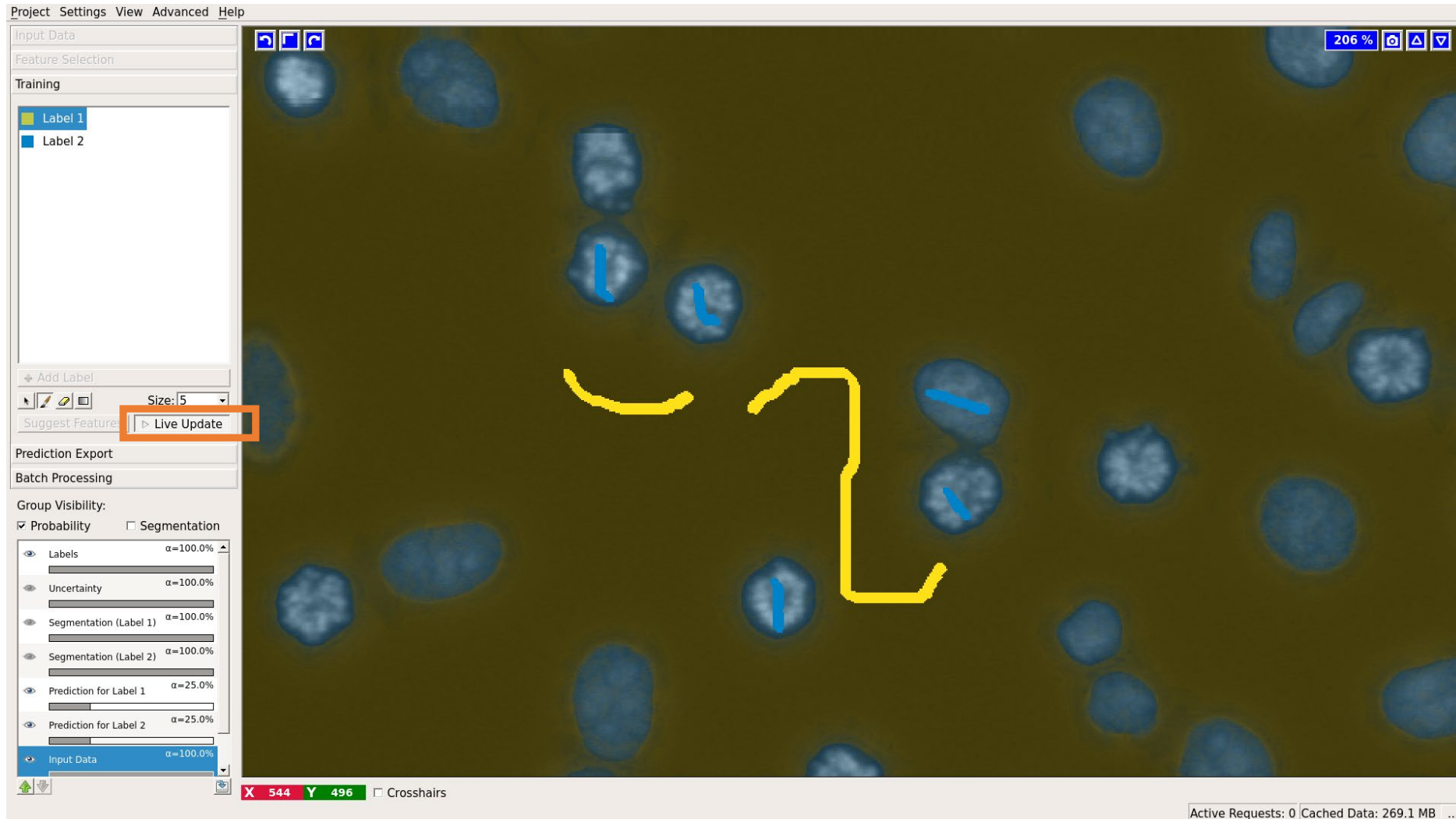
Output classes:

Healthy Cells

Sick Cells



Machine learning requires training data





Thank you!
And Demo time