

**OST**  
Ostschweizer  
Fachhochschule

# Image processing for smart sensors at OST

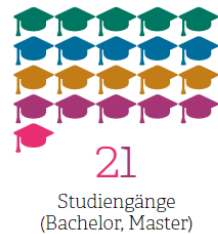
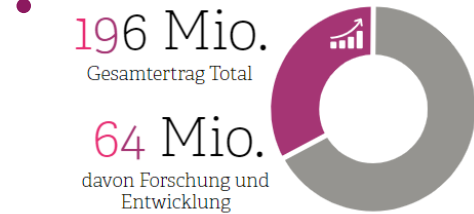
**Prof. Dr. Carlo Bach**

24. Mai 2022

School of Technology / Institute IMP Campus Buchs / [www.ost.ch/imp](http://www.ost.ch/imp) [carlo.bach@ost.ch](mailto:carlo.bach@ost.ch)

# OST?

- Ostschweizer Fachhochschule / Eastern Switzerland University of Applied Sciences
- unites the 3 universities of applied sciences since September 1, 2020
  - FHS St.Gallen,
  - HSR Rapperswil and
  - NTB Buchs

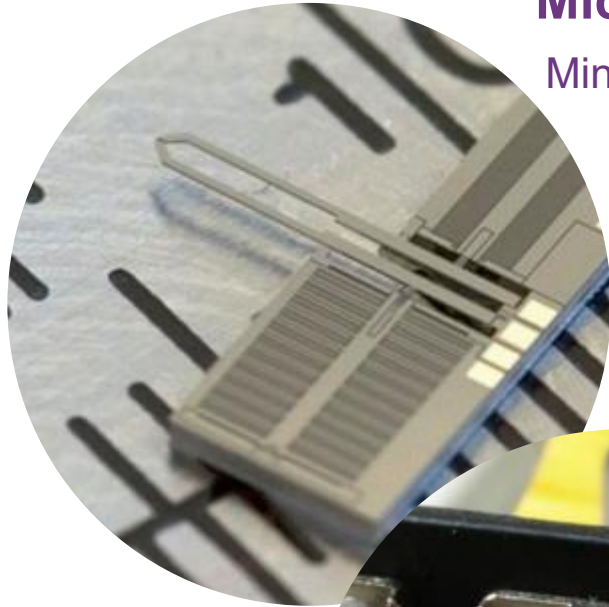




# Institute of Microtechnology and Photonics (IMP)

## Microtechnology (MEMS, MOEMS)

Miniaturized systems, ...



## Production Metrology

Dimensions in highest accuracy



## Fab

Wafer based processing  
R&D  
Pilot line



## Photonic & Optics

...from development to production

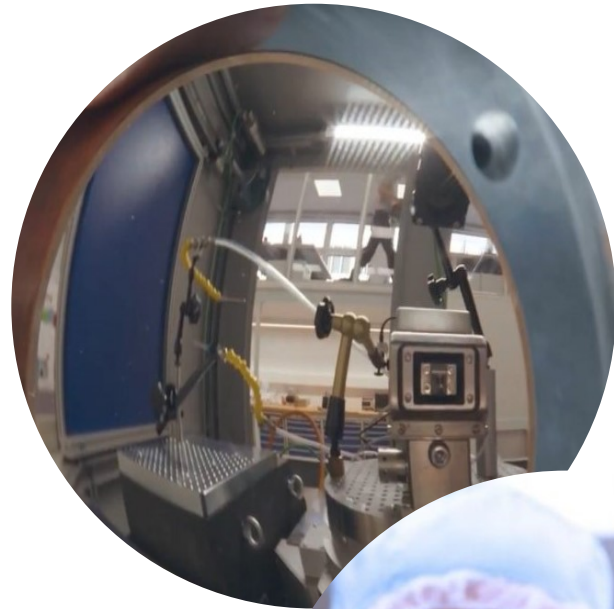


## Materials

Characterization and formulation of materials



# Rhysearch



## Ultraprecision

... Manufacturing next Swiss standards...



## Optical Coatings

... from high end coating technology to qualification ...

## ESA :: Electronics

... Sensors and Actrics, LED, Laser ...

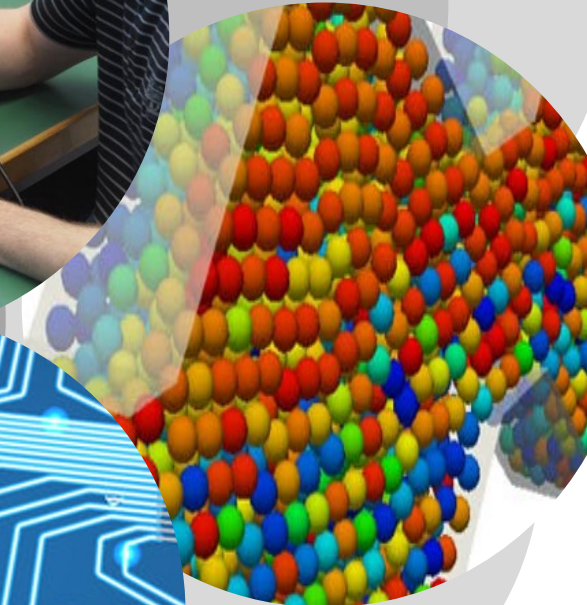
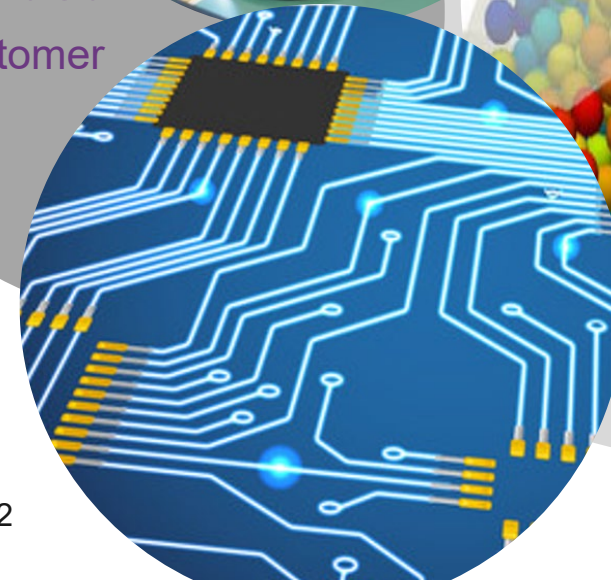
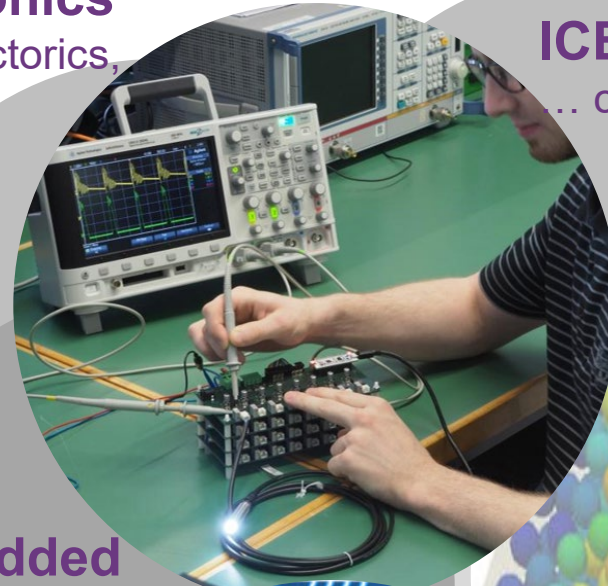
## IMES :: Embedded

... systems for customer applications...

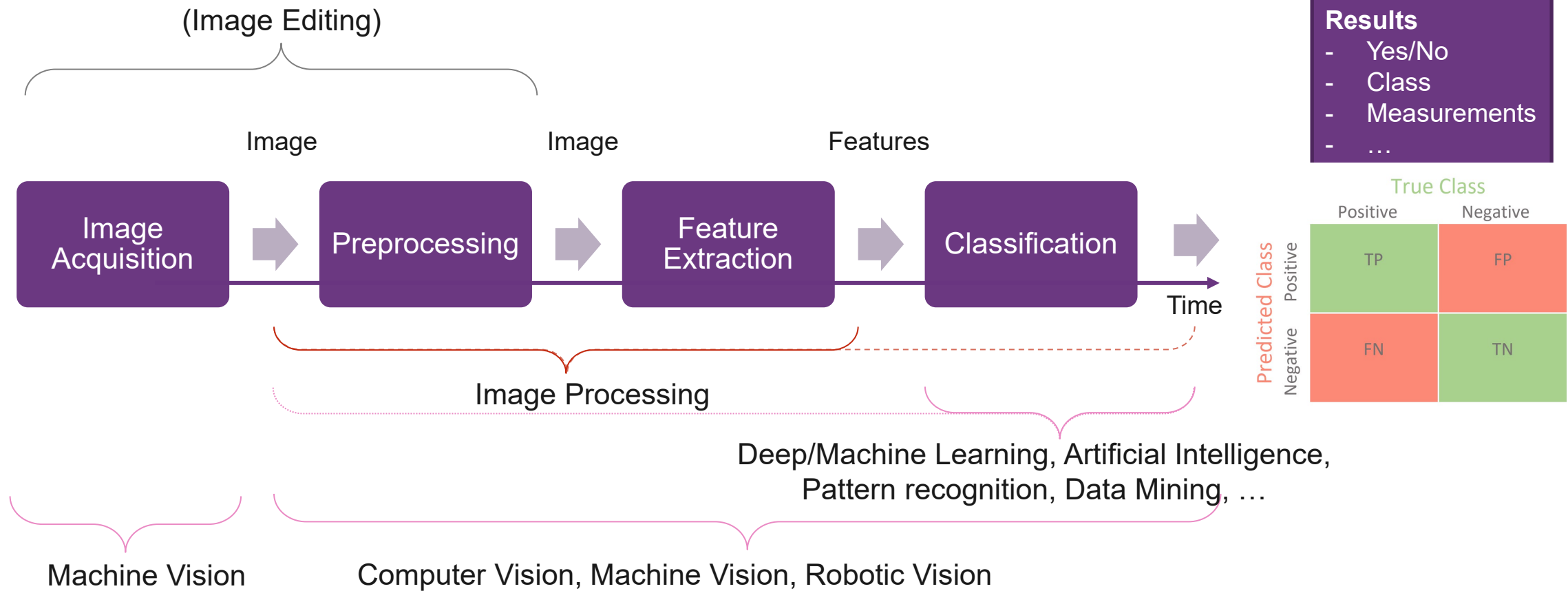
# OST

## ICE :: Data

... computational engineering and data analysis ...



# Image Processing Pipeline





# Smart Sensors



Cognex

Microsoft Azure Kinect

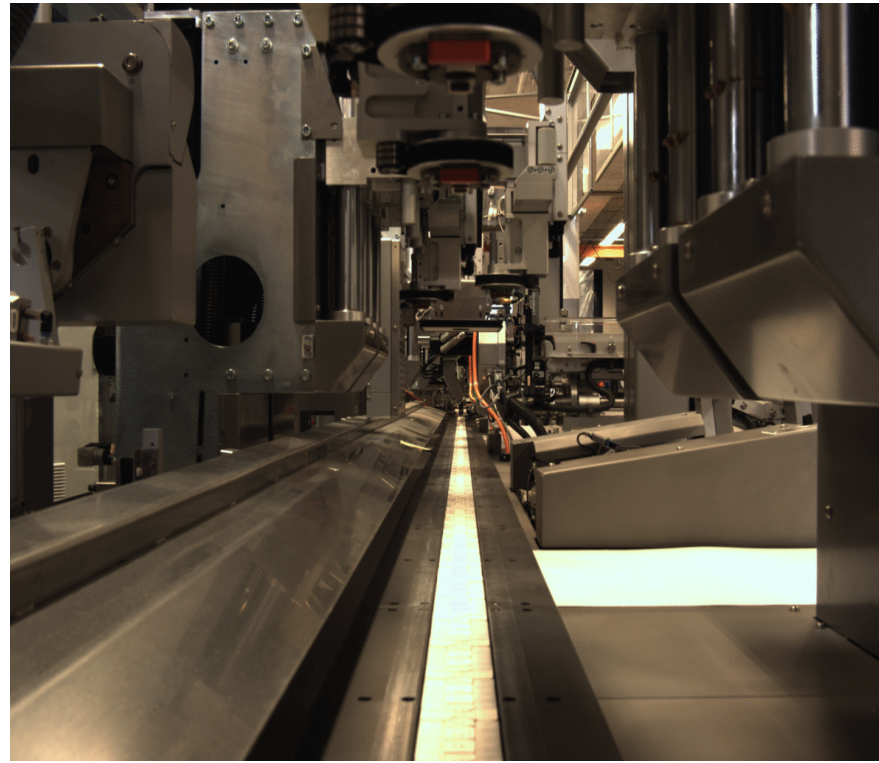
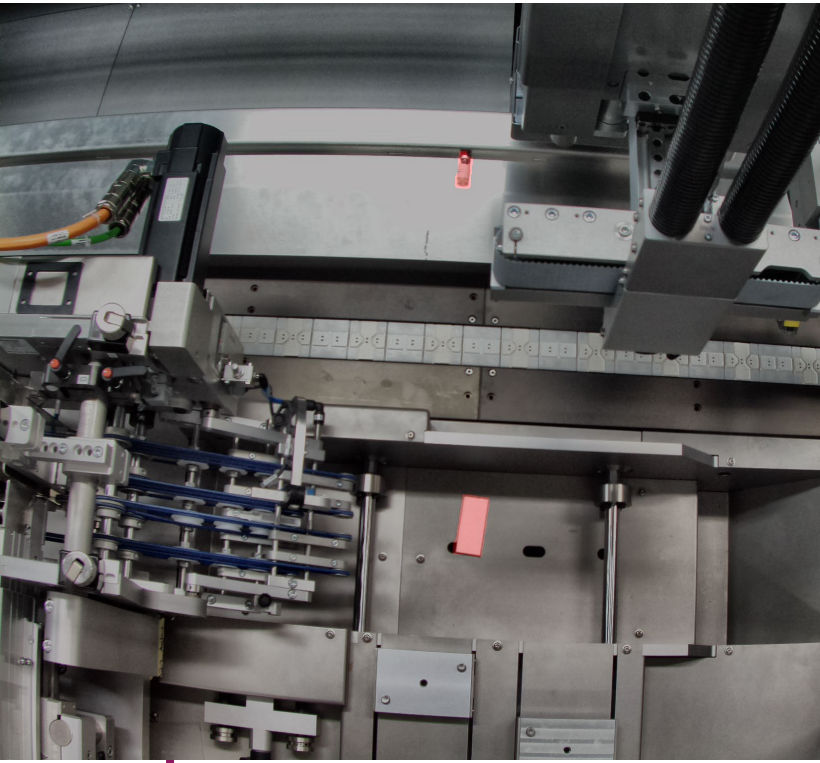


Intel RealSense



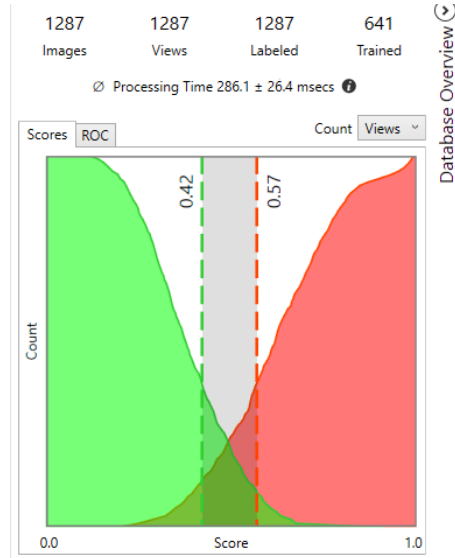
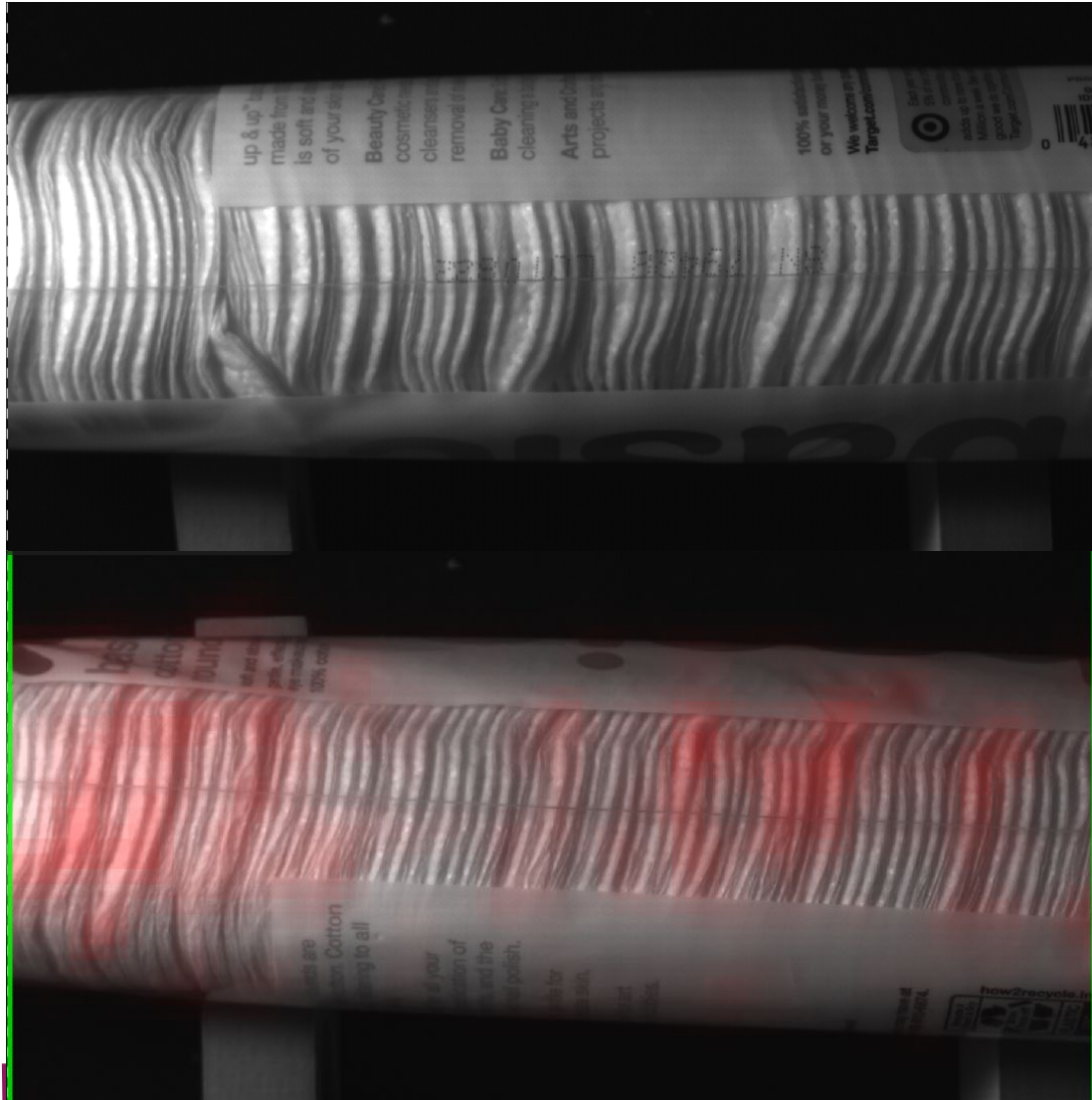
# Image Acquisition - Ambient Light

- Outdoor applications or applications in environments not controllable are very difficult to handle with high precision
- Techniques: e.g. keypoint detection, background subtraction,



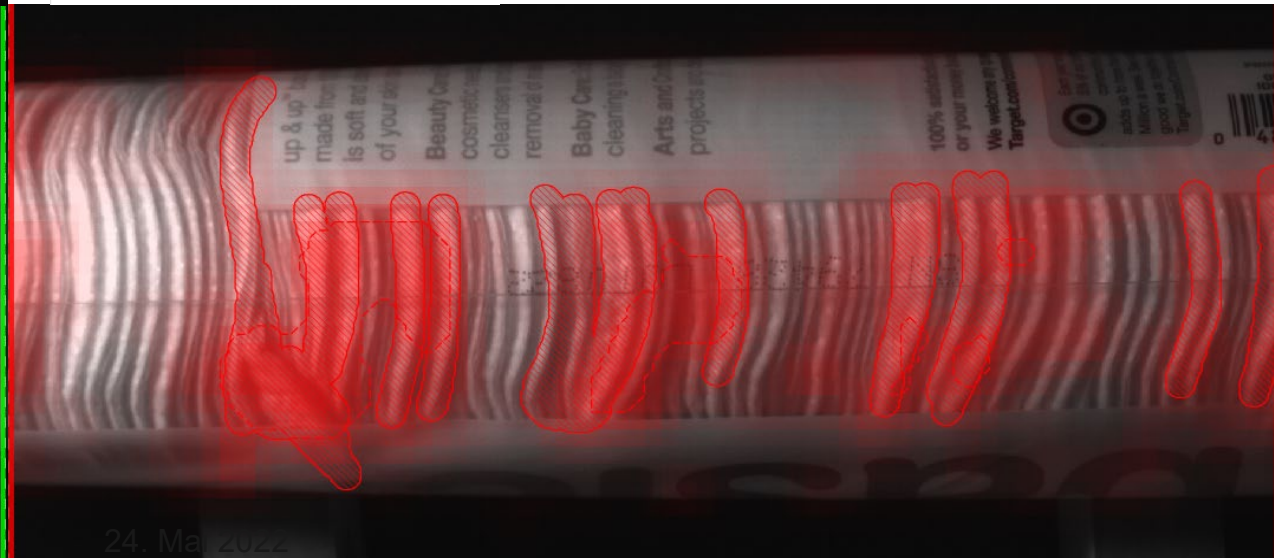


# Classification with Machine Learning



## Confusion Matrix

		Predicted			Total
		Good	Inter	Bad	
Actual	Good	<u>431</u>	<u>199</u>	<u>66</u>	<u>696</u>
	Bad	<u>76</u>	<u>155</u>	<u>360</u>	<u>591</u>





# Challenges

- **Miniaturization**
- **Low Power**
- **Networking – Working on the Edge and Working in the Cloud**
- **Computing Power**
- **Ease of Programming**



## Tag der Systemtechnik

Systemtechnik neu entdecken

15. Juni 2022, 14.00 Uhr  
OST Campus Buchs

[ost.ch/tag-der-systemtechnik](https://ost.ch/tag-der-systemtechnik)

