

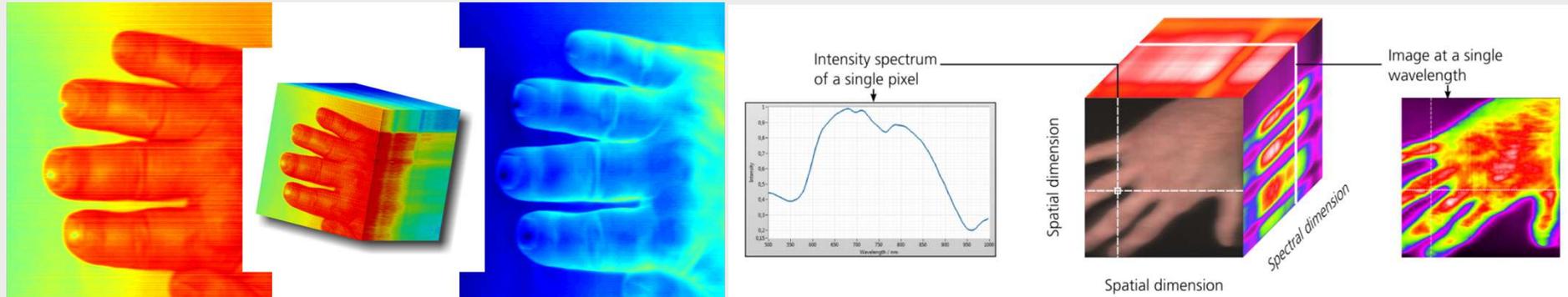
TI-CAM

» High Performance Hyperspectral Imaging

The camera technology to acquire and display
chemical information in images

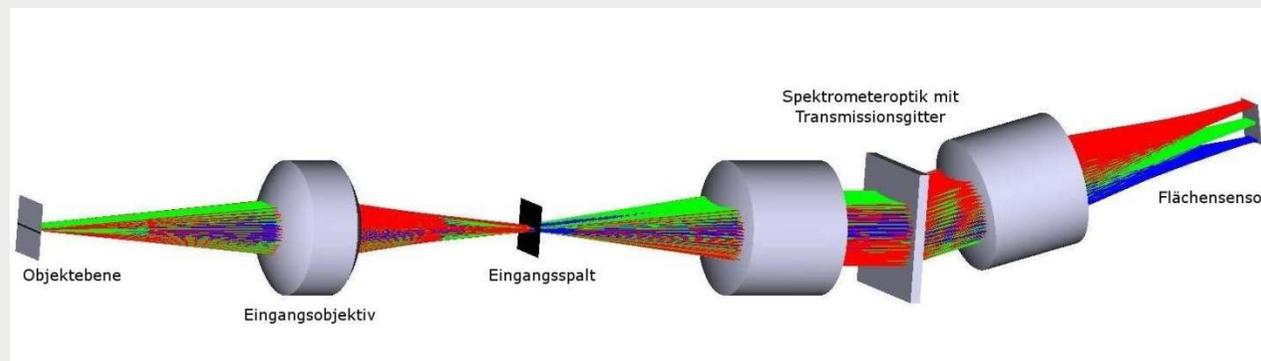
SpekLED GmbH is a company in optoelectronic measurement technology and has specialized in the development, application integration and production of innovative hyperspectral imaging systems, preferably in medical research and in the life sciences field.





The hyperspectral image cube:

2 dimensions for imaging and the third dimension for spectroscopy.



The TI-CAM

» Hyperspectral solutions for Medicine and Life Sciences



The TI-CAM combines the advantages of color cameras with those of spectrometers:

>>Chemical or physiological information in image format

Medicine

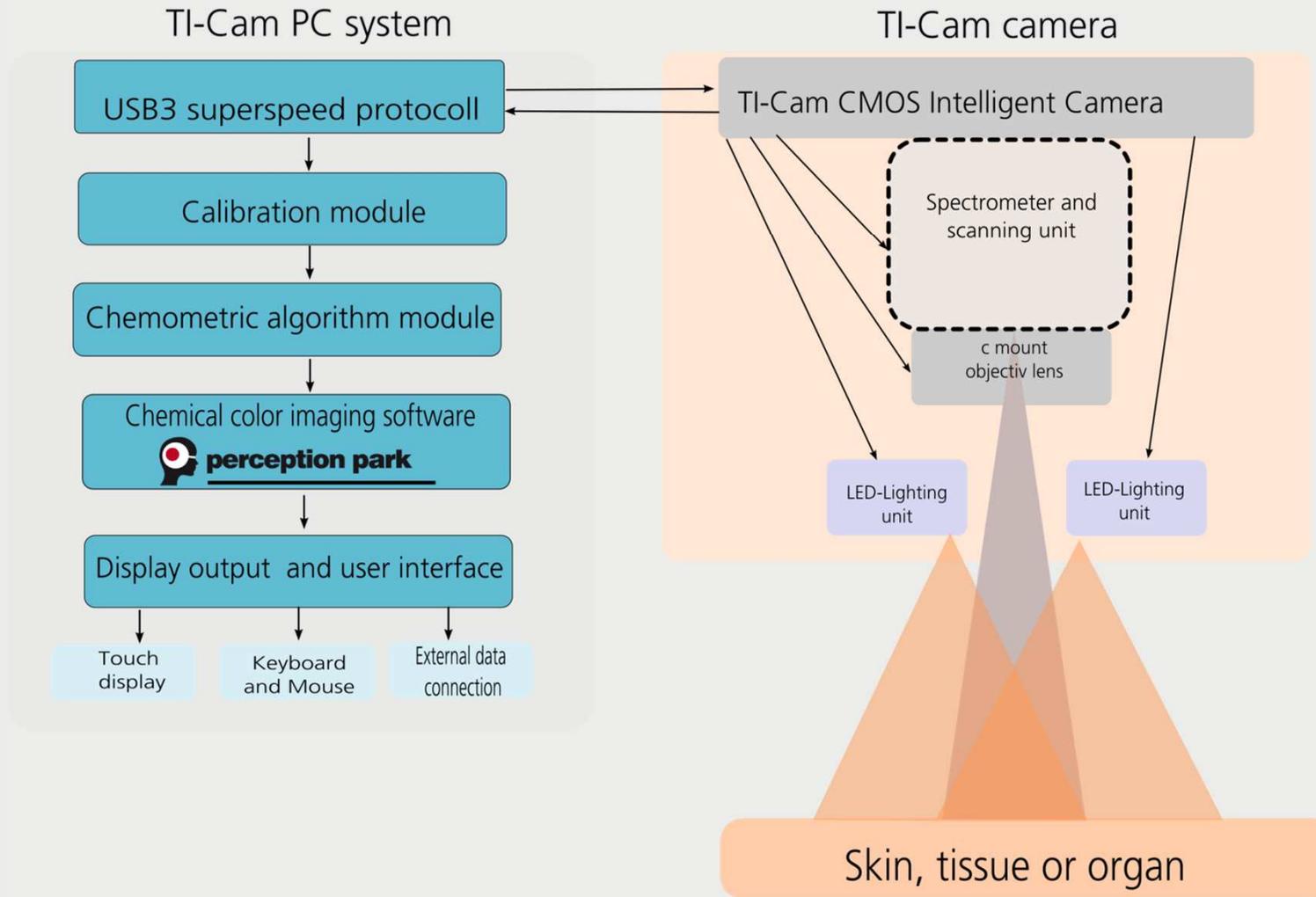
- >> Perfusion imaging
- >> Tumor detection
- >> Surgery support
- >> Angiography
- >> Wound healing
- >> Chemical tissue analysis
- >> Spectroscopic histology

Life Sciences

- >> Food Analysis , -control and -research
- >> Forensics
- >> Agricultural Research
- >> Chemical analysis in microscopy



TI-Cam System



Benefits of the TI-CAM technology:

- >> Fully integrated hyperspectral camera unit.
- >> High-quality integrated pushbroom imaging spectrometer.
- >> Robust camera setup.
- >> Easy configurable for high resolution or high frame rate.
- >> High spectral and high image resolution with real data cubes.
- >> Cost effective in comparison with hyperspectral snapshot imagers.
- >> Full spectra for using standard chemometric preprocessing (eg. 2nd spectral derivative).

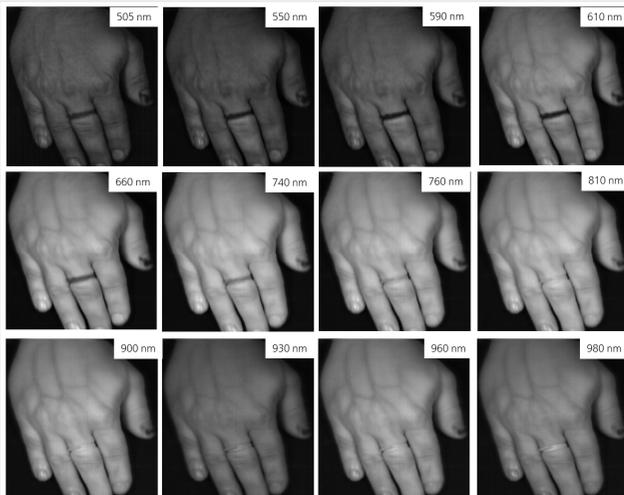
TI-CAM

» Example1: Hand with occluded finger

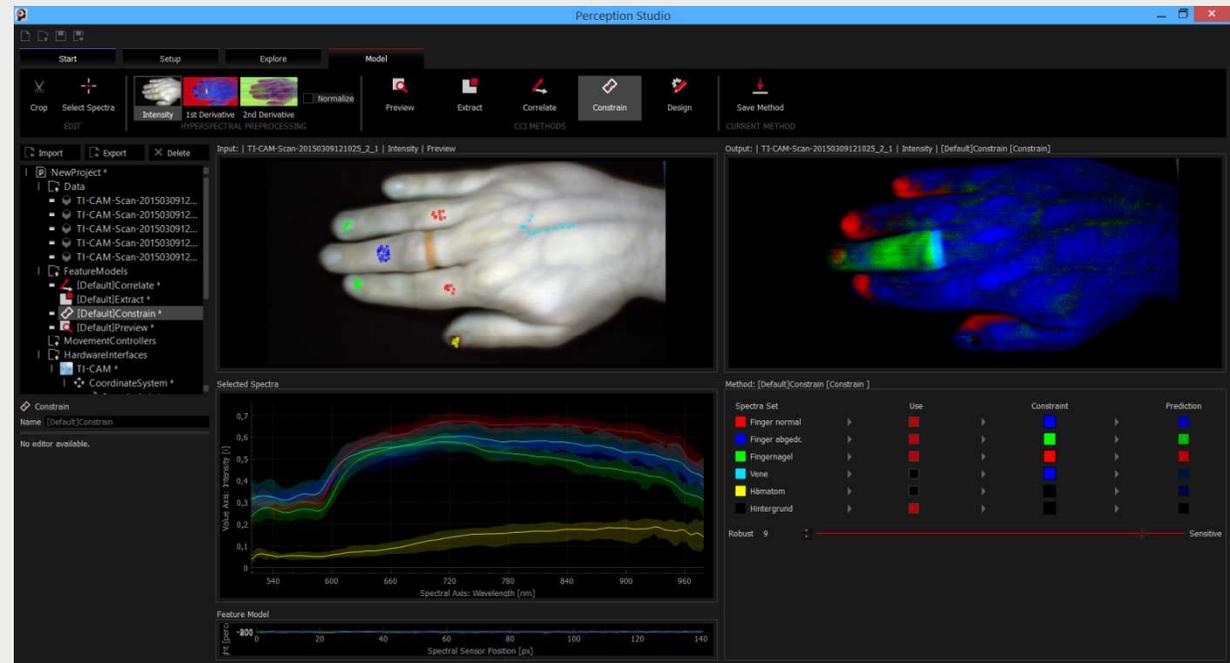
» color image



» extraction of multispectral images suitable.



» Hyperspectral image with spectral selection



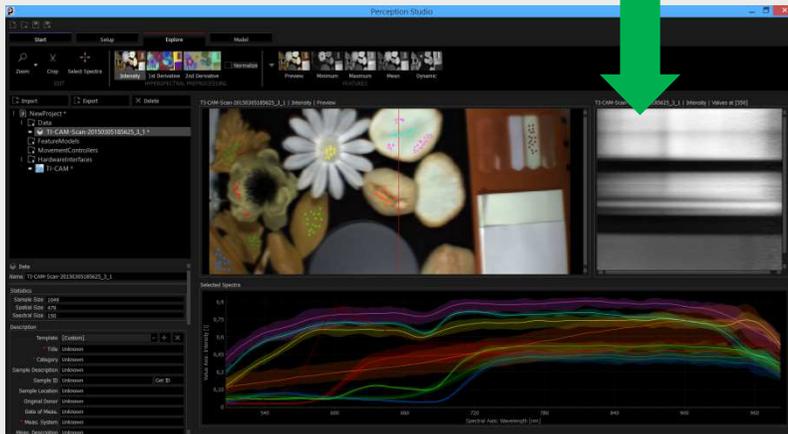
» Data export in MATLAB, ENVI and other formats possible.



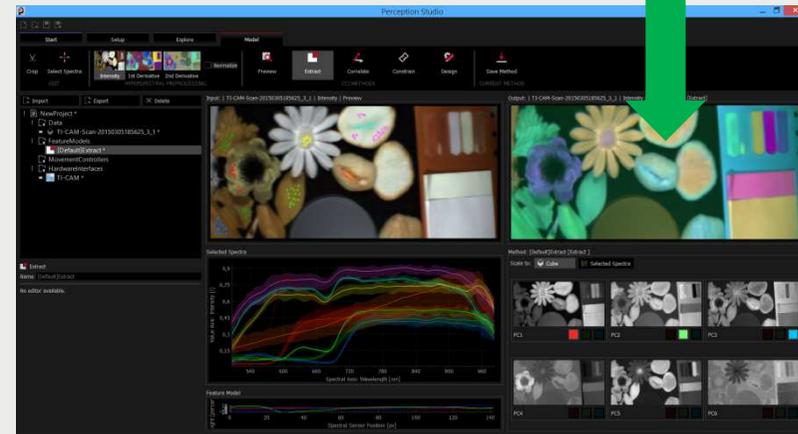
TI-CAM

» Example 2: Hyperspectral image

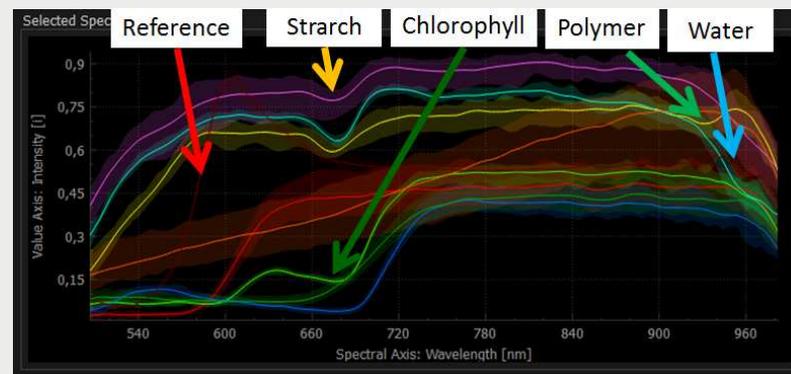
Spectral cut in Y (Intensity)



PCA transformed image in color representation



Color image

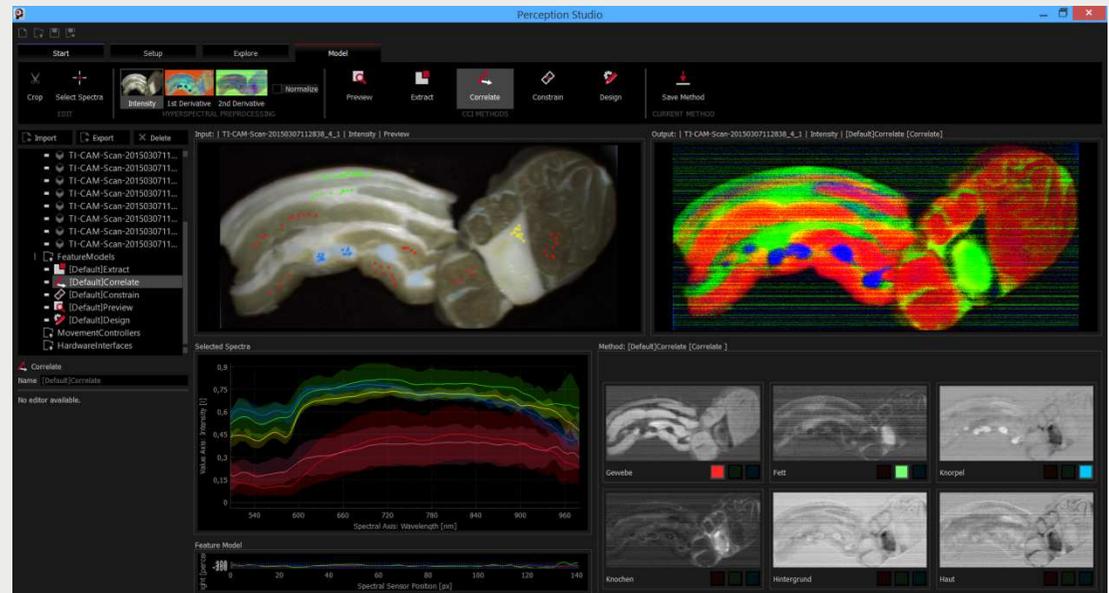
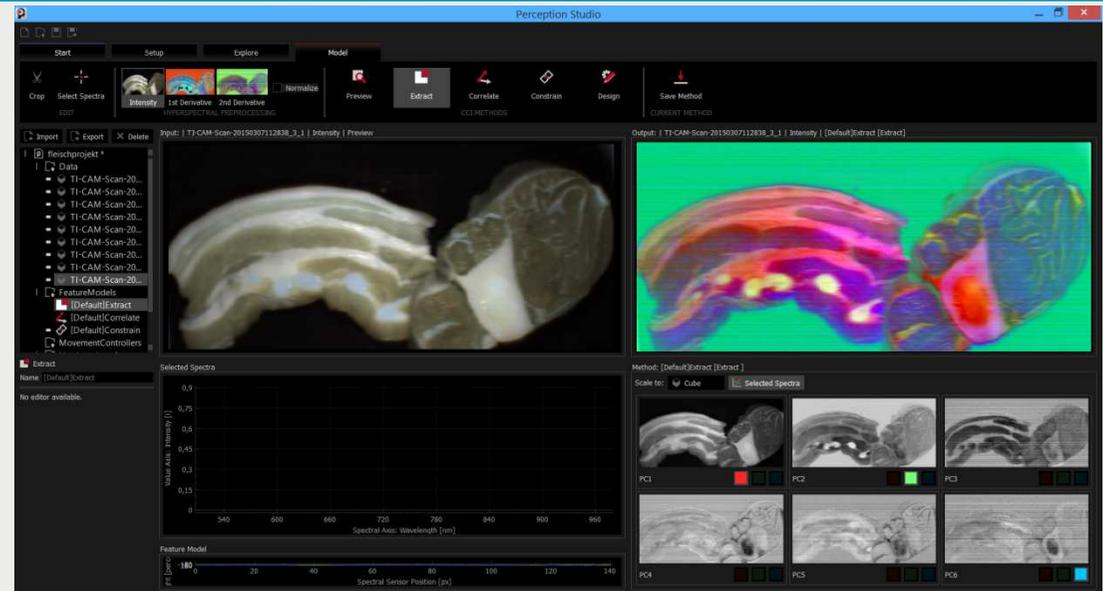


Spectra of marked pixels and their chemical characteristics



TI-CAM

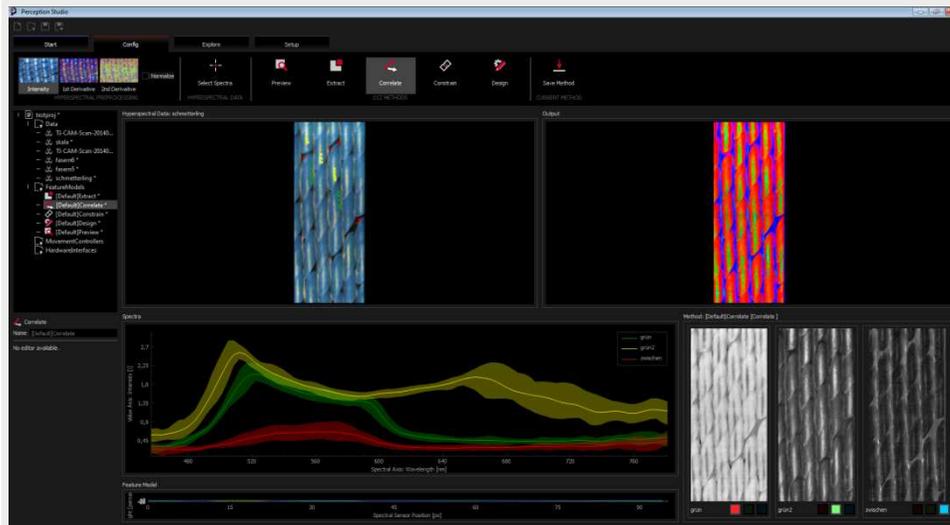
» Example 3: Hyperspectral Image of animal tissue



TI-CAM

» Example 4: Application on a scientific microscope

Image of a butterfly wing



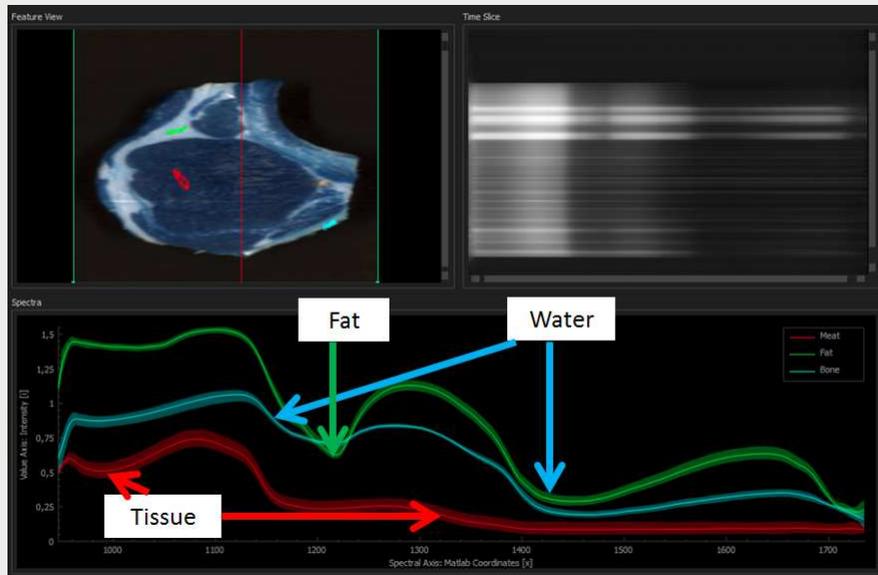
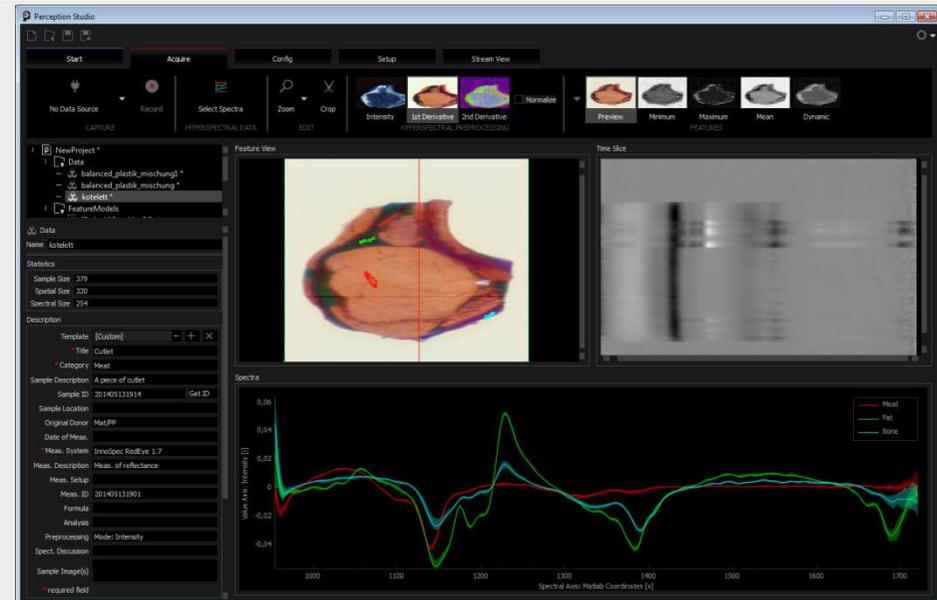
Hyperspectral image of a fibre probe



The hyperspectral cameras can be installed by their c-mount connection to the camera adapter of most microscopes. As a result, chemical analyzes are made possible within microscopy.

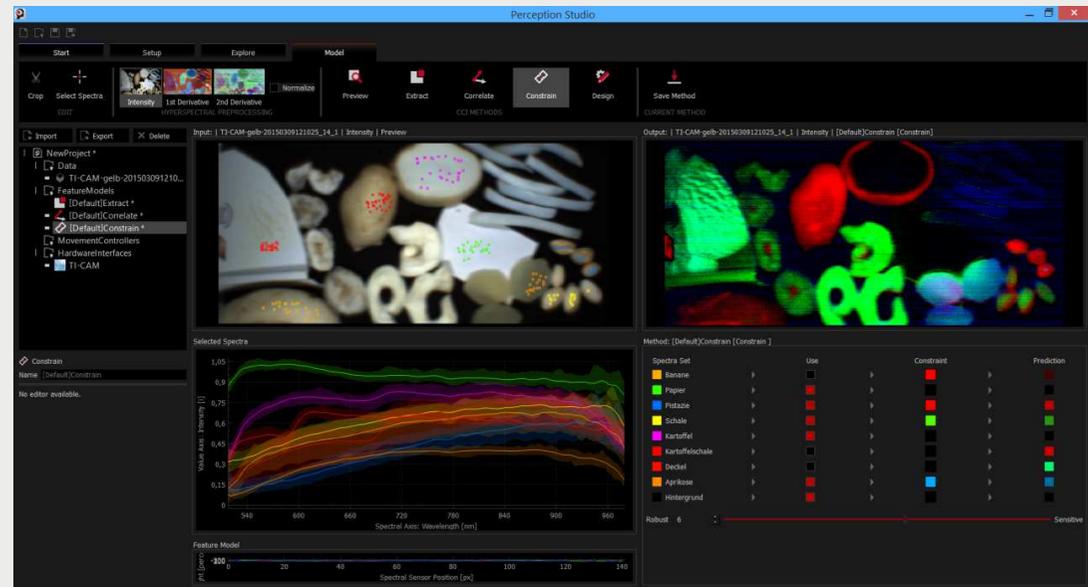
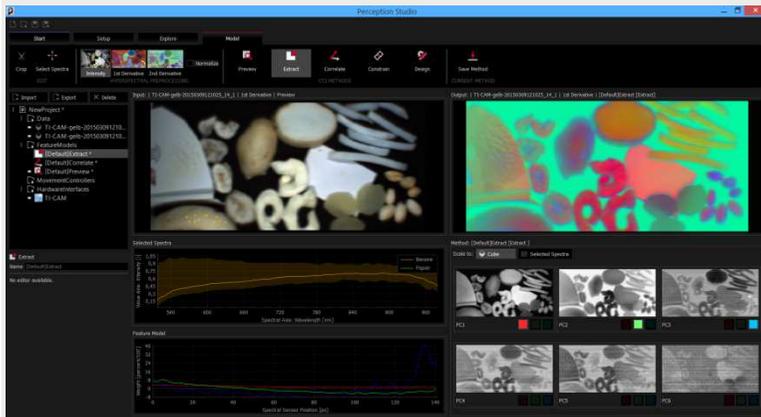
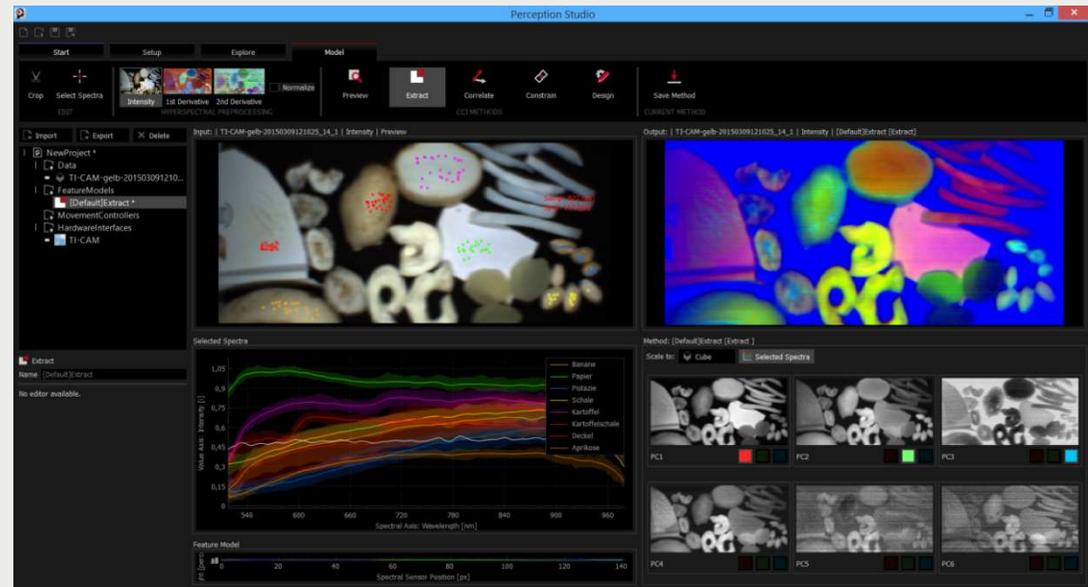


TI- CAM : NIR system 1000 nm bis 1700 nm
 » Example 5: Hyperspectral image of animal tissue



TI-CAM

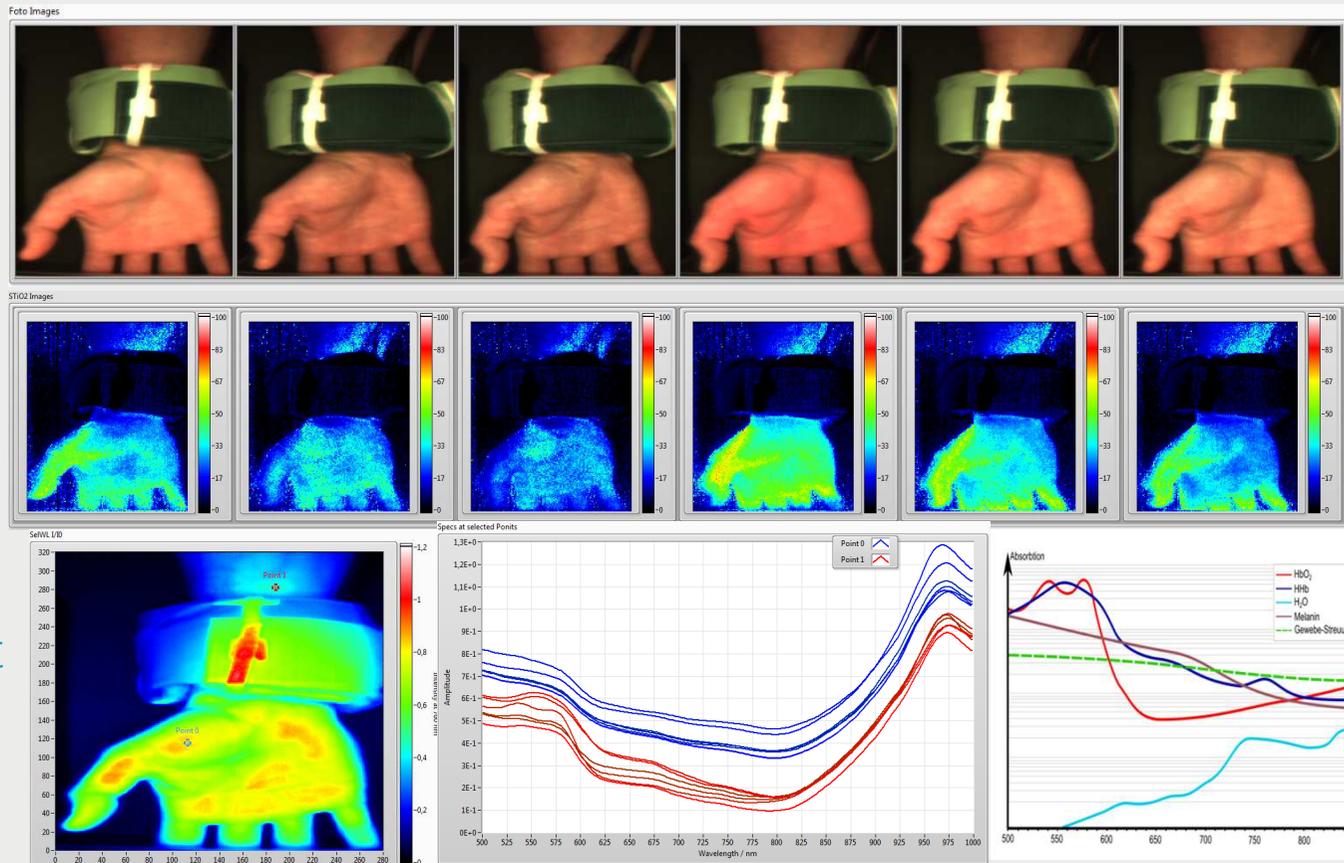
» Example 6: Hyperspectral image of yellow samples



TI- CAM Monitoring system

» Example 7: Imaging tissue oximetry

Application of the 2D spectroscopy technology for imaging oximetry



» Spectral time course at different measuring points .

The TI-CAM provides image sequences , in which each pixel contains a full VIS / NIR spectrum. So color images can be generated in combination with oximetric image data.

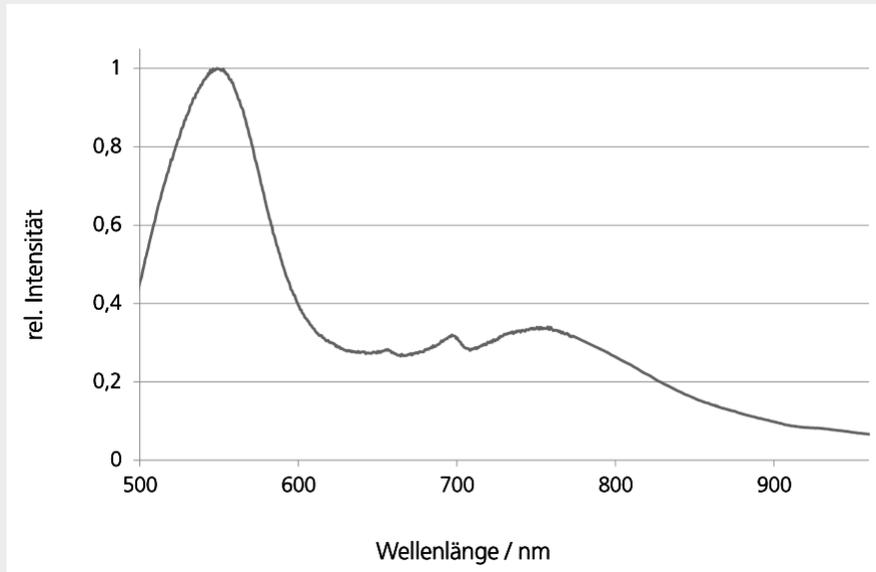


Medical measurement parameters (in preparation) :

- Hemoglobin tissue oxygenation (oxyHb Index and deoxyHb Index)
- Tissue Hemoglobin concentration index
- Tissue water index
- Fat index
- optional wound healing markers
- optional markers of burn wounds



Option: LED based lighting unit



Lighting unit based on broadband LED light sources

