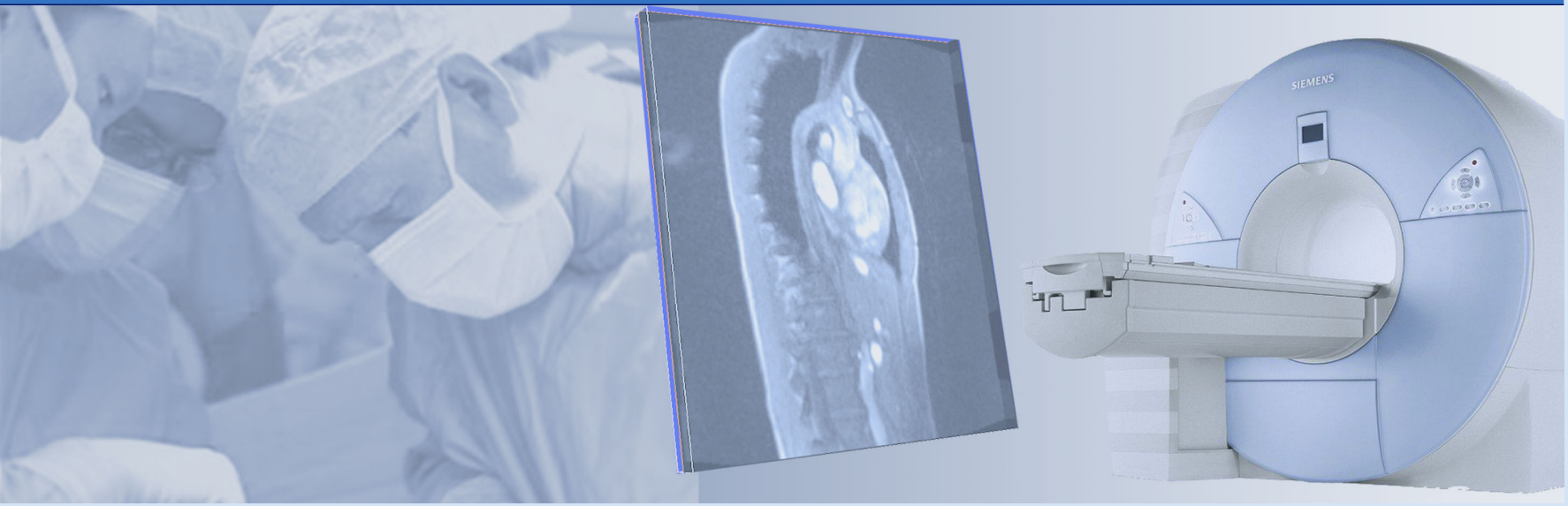
Tutorial computer- and robot-assisted surgery



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NATIONALES CENTRUM
FÜR TUMORERKRANKUNGEN
PARTNERSTANDORT DRESDEN
UNIVERSITÄTS KREBSCENTRUM UCC

getragen von:
Deutsches Krebsforschungszentrum
Universitätsklinikum Carl Gustav Carus Dresden
Medizinische Fakultät Carl Gustav Carus, TU Dresden
Helmholtz-Zentrum Dresden-Rossendorf

Sebastian Bodenstedt
Translational Surgical Oncology

Contact

sebastian.bodenstedt@nct-dresden.de

https://www.nct-dresden.de/tso.html

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Goals and topics

Make information from lecture accessible through discussion and practical applications

- Opportunity to clarify and discuss issues from the lecture
- Opportunity to try out methods and ideas from the lecture
- What are the pros and cons of the methods?
- How can the acquired knowledge be applied to practical examples?

Questions from the lecture?

Jupyter

- Interactive web interface for programming
  - Can be used with multiple languages (e.g. Python)
- Can be run locally
  - How to install: https://jupyter.org/install
- Or via external service, e.g. Google Colab (requires a Google account)

Live Demonstration Jupyter

- Notebooks will be upload to Opal

OpenCV

- Open Source Computer Vision Library
  - Opencv.org
  - C++ with Wrappers for Python, Java, ...
-
- Contains functions for digital image processing
  - 2D & 3D features
  - Feature tracking
  - Camera calibration & 3D
  - Face recognition
  - Machine learning
  - ...

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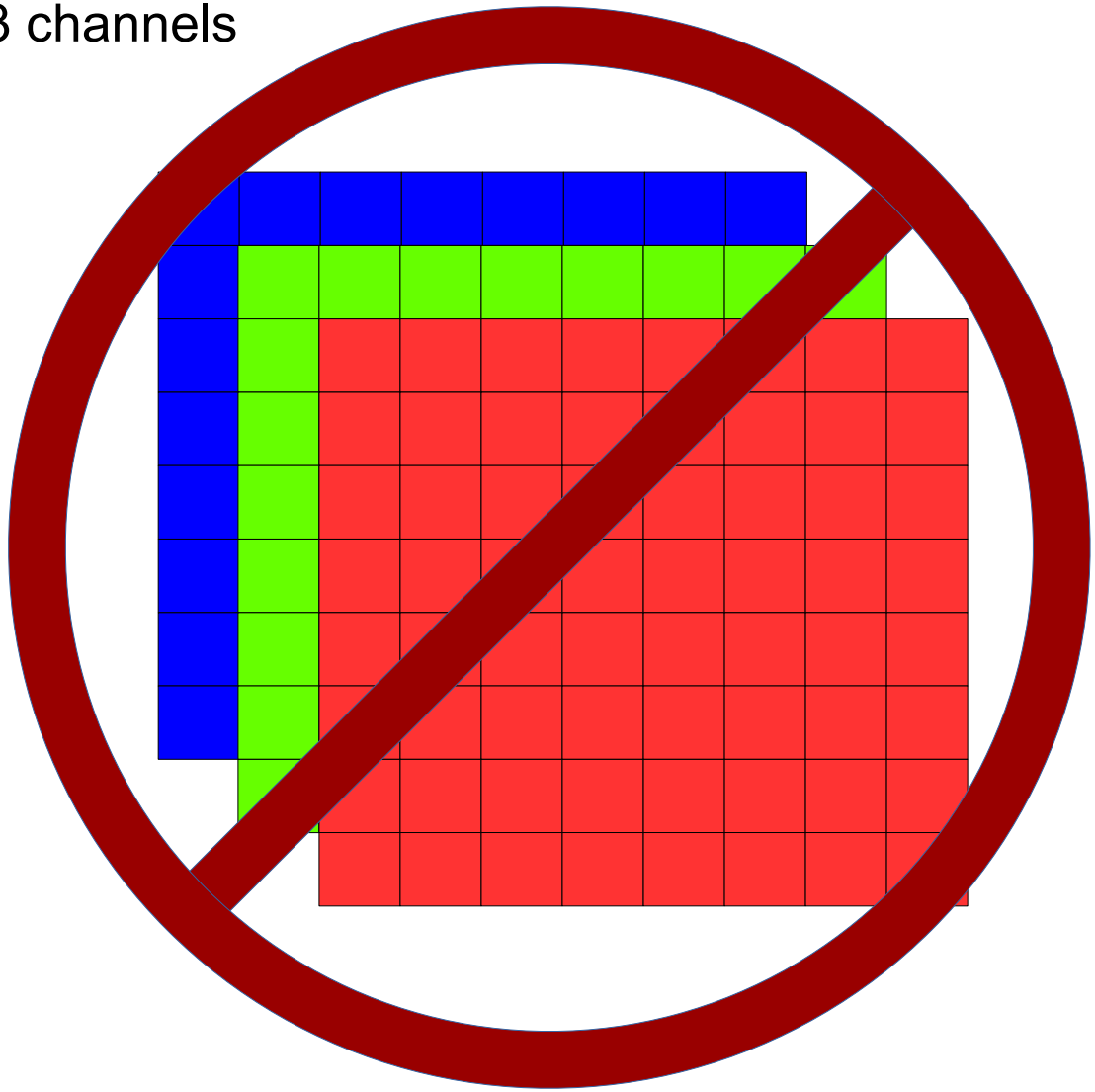
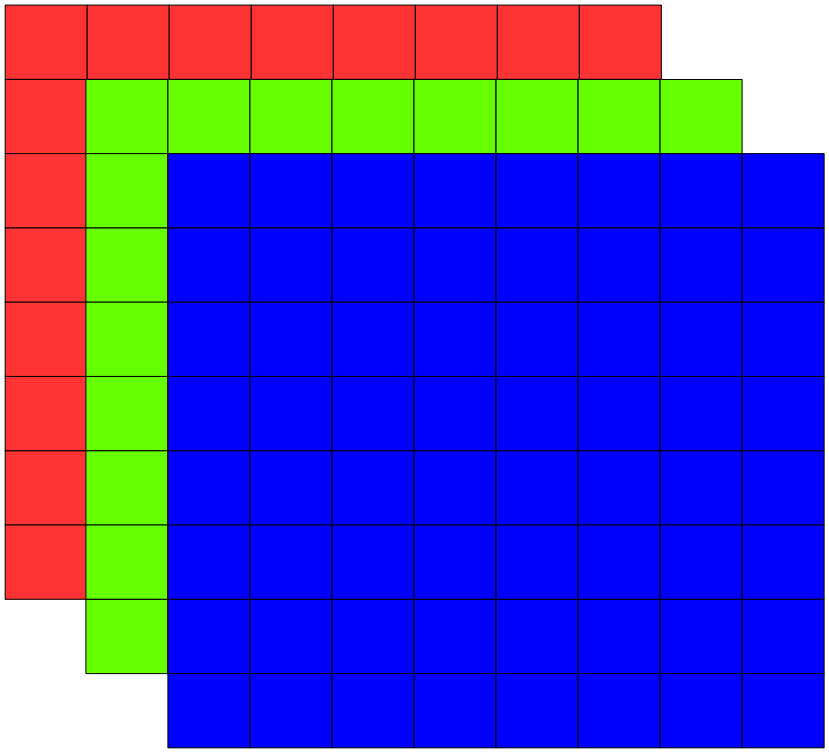
Images OpenCV

- Matrix with 3 channels



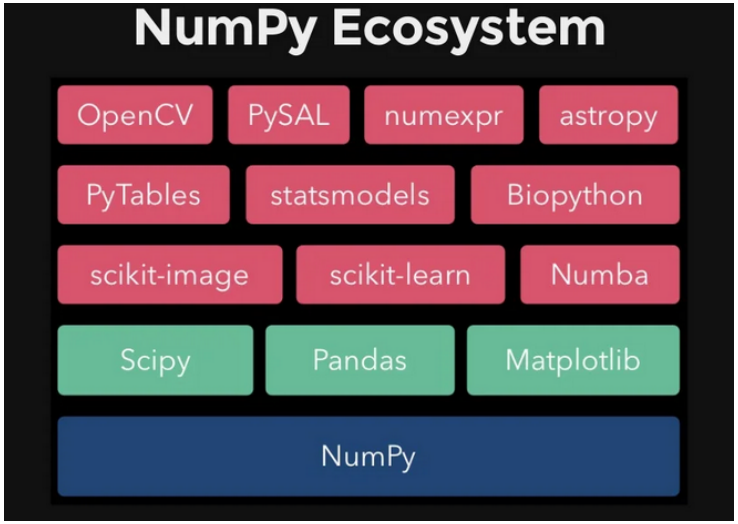
Images OpenCV

- Matrix with 3 channels
  - Order Green-Blue-Red



NumPy

- Python library for array-oriented computation
  - C based
  - Efficient
- Usable for many applications
  - Image processing
  - Signal processing
  - Linear algebra
  - …
- Cheat sheet: https://www.datacamp.com/cheat-sheet/numpy-cheat-sheet-data-analysis-in-python



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Any questions?