



MIC online training:	Imaging statistics
Date:	April 27, 2021
Time:	9 am – 5 pm
Location:	Online in Zoom, using this meeting link .
Trainers:	Dr. Maciej Dobrzynski, ICB, Dr. Guillaume Witz, ScITS and MIC, Dr. Yury Belyaev, MIC, University of Bern (CH)
Organizer:	MIC of the University of Bern (www.mic.unibe.ch). Dr. Yury Belyaev, MIC, University of Bern (CH) Dr. Guillaume Witz, ScITS and MIC, University of Bern (CH) Supported by the PhD specialization Cutting Edge Microscopy.
Number of participants:	minimum 10, maximum 25
Registration:	until April 20, 2021, here .
Target audience:	PhD students, postdocs, and everyone who wants to get acquainted with modern practices for analysing data derived from microscopy images. Understanding of basic concepts of programming and image processing is recommended for participation in the course.
Credits:	Certificate of attendance. On request, PhD students of the Cutting Edge Microscopy program can obtain 0.5 ECTS for this course with presenting the learning outcome in the context of his/her project at a separate meeting.
Background:	In modern life sciences, making the image data analysis process quantitative and reproducible is increasingly important and involves four steps: image acquisition, image processing, data analysis, sharing of workflow. In this workshop, we will discuss each of these steps and present currently cutting-edge solutions based on open-source software. We will: 1) discuss the optimisation of the data acquisition itself; 2) learn how to extract information through an image processing workflow in Python, currently the most popular computer vision language; 3) discuss the statistical analysis of the extracted information and learn how to perform it using R, currently the most popular statistical analysis language; finally 4) discuss how to share the entire analysis pipeline to make it fully reproducible.
Content:	Guide to acquisition of microscopy images suitable for quantitative analysis. Design image processing workflows in Python. Basic concepts of statistical methods. Design of statistical analysis workflows in R focused on microscopy images data. Discussion and demonstration of how to make a complete workflow reproducible. Work with own data. Advise on the projects of the participants.
Learning outcome:	Participants will learn how to acquire quantitative microscopy images and perform reliable statistical analysis of derived data using R and Python.
Schedule:	See next page

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Time	Day 1 Tuesday, 27.04.21
9:00-12:00	Welcome Quantitative imaging Y. Belyaev, MIC Image processing with Python G. Witz, ScITS-MIC
12:00-13:30	Lunch
13:30-17:00	Imaging statistics with R M. Dobrzynski, ICB Sharing workflows G. Witz, ScITS-MIC Work with own data