

## Workshop – “Advanced Image Analysis and Macro Programming”

### Content:

This advanced workshop builds up on the previous workshop "Scientific Image Processing and Analysis" and offers one or (dependent on the time schedule) several advanced analyses topics (see below) as well as a broader introduction into the ImageJ1.x macro language. The latter is suitable for anybody working with ImageJ or Fiji even without any previous knowledge in programming. We will start with an easy to understand introduction to the basic terms and commands.

This course gives you a sound introduction into the macro language which will enable you to automate repetitive image processing tasks or specific analyses procedures. This will not only save you time on the long-run but will also increase reproducibility while reducing use-bias as often strongly introduced during manual procedures.

### Specific Topics (modulated according to participants major interests):

- Day 1 - Advanced Image Processing and Analysis:
  - Optional topics depending on participants major interest:
    - Advanced image filters and feature extraction from true-color images
    - Statistical co-localization analysis
    - 3D and 4D tracking of moving objects
    - Working on own analysis questions/problems (if communicated beforehand to BioVoxxel)
  - Introduction into the basics of the ImageJ macro language
    - revisit the macro recorder
    - what are variables and how to use them?
- Day 2 - Macro Programming and Automation
  - Introduction into basic terms and commands of the macro language
  - Simple extensions to recorded macros to make it widely applicable
  - Add user-dialogs to macros to enable customizability during macro usage
  - Repeating processes (for-, while-, do-while-loops)
  - Conditional processes (if-then-else statements)
  - Usage of the ROI-Manager and selections in macros
  - Saving and opening images and results in a macro
  - Defining macro output (results table, log-window, saving to preferences)
  - Read in previous results and preferences in a macro

### Aim:

The workshop should give scientists an introduction and tips to use the ImageJ1.x macro language to reduce manual workload during image processing and analysis.

### Target Group:

PhD Students and PostDocs which use ImageJ or Fiji already to process and analyze their images.

### Pre-requisite:

Premise to take part in this course is the previous participation in the BioVoxxel course "Scientific Image Processing and Analysis" since we will build up on topics learned beforehand.

### Methodology

We will work on example images and example analysis questions to directly learn the analysis and especially the programming hands-on and deal with upcoming questions and problems. A version of Fiji as used in the previous course should be installed on the computer previously to the course.

### Trainer:

Dr. Jan Brocher ([www.biovoxxel.de](http://www.biovoxxel.de))