

MULTIMODAL MODULAR OPTICS TOOLBOX FOR PHOTONIC EDUCATION

Barbora Marsikova, Benedict Diederich, René Richter, Rainer Heintzmann
Leibniz-Institute of Photonic Technology
Albert-Einstein-Str. 9
07745 Jena
Germany
E-mail: marsikova.b@gmail.com

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This project belongs to the open-source hardware project UC2 [YouSeeToo] [1]. UC2 is in active development. It not only modularizes the optical setup but also allows creating modules for very specific purposes. Furthermore, its click-and-go concept simplifies the process of alignment and it is ideal for rapid prototyping. With improvement of resolution, image quality and other important features, microscopy became rather expensive and often bulky. Although it's beneficial in many research areas, it can be a disadvantage in the area of education of optics and photonics. The motivation for this project is to provide budget-priced microscopes and other optical and optomechanical parts for educational purposes. University students and also secondary school and high school pupils shall benefit from the comprehensive toolbox including a smartphone app during their studies. We developed a lego-like toolbox to build optical setups. Together with 3D printed housings, off-the-shelf optical components and smartphones we create a general modular framework for the purpose of easy use in education of optics and related fields. We also provide manuals and guidelines for making the toolbox user-friendly even for beginners to the topic. Besides, we organise workshops for students, to introduce our concept to the professional public.

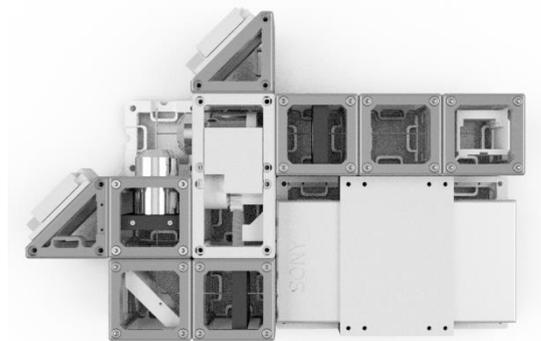


Figure 1: Ligh-sheet microscope design using the modular framework

By finding a broad network of collaborating schools and universities, iterative testing and improving the toolbox, we aim to establish an educational concept that will become a helpful tool in the education of the future photonics researchers. But that is just one branch of our project. Moreover the system might also be used as disposable microscope for the work in biohazards environments or as medical device for improving the human life standard in regions, lacking in infrastructure, such as development countries e.g. to detect contaminated water.

References:

[1] UC2 GitHub repository [Online], 2019 [2019-01-22] Available on:
<https://github.com/bionanoimaging/UC2-GIT>.