Software NanoTruth

Development status

Phase 2

Feasibility study. There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

IP protection status

SW -Copyright protection

Partnering strategy

investment, licensing

Institution

jctt Jihočeské Univerzitní a Akademické centrum transferu technologií

University of South Bohemia in České Budějovice

Challenge

The global microscopy market continues to grow, with installed devices being renewed and replaced. The market is very competitive and new companies offering less well-known technical solutions are constantly growing. However, these technical solutions show the same optical and mechanical shortcomings in the interpretation of the displayed data. The sources of these problems are: (1) orientation to standard optical solutions that are suitable for eye observation of the sample but not for digital camera observation (2) the idea of one sufficient "general" focus plane even for relatively thick samples (20 µm) (3) non-mining of digital information, on the contrary distortion for visually nice appearance of images and subsequent manual analysis. NanoTruth technology significantly eliminates the above shortcomings and is able to replace most of the simultaneously used solutions, both in the field of fluorescent and electron microscopy.

Description

NanoTruth is the control software of a simple very high-resolution microscope that enables a number of unique data collections, the most demanding of which is a time-lapsed series of sharpened images. Key system options: - camera exposure settings - voltage adjustment on a high-performance LED - find the position of the focus planes and estimate its range - setting the control of time-lapsed sensing of sets of sharpened images, so-called z-scans - positioning the microscope table with the sample in front of the lens position. - control of scanning of multimegapixel 12-bit data and their storage in a remote storage. The software works in a Linux operating system implemented on Nvidia's Jetson Xavier micro-supercomputer. The control of the camera consists primarily in setting the correct exposure. Light intensity control is possible. The intermitent light is only switched on at the time of scanning to minimize damage to the sample. Despite the very high light intensity achieved on the diode, the integral amount of incident energy is smaller than that of conventional microscopy with constant lighting.

Commercial opportunity

It is possible to use it in the microscopy of living cells – tissue culture – compared to current technologies, the image obtained by NanoTruth technology shows a relatively large field of view at a large magnification, which makes it impossible to create sufficient statistics on cell behavior. Another advantage is the sensing (auto)fluorescence and passing radiation at the same time and the possibility of creating a 3D image. Material engineering assumes the use of NanoTruth technology especially in the production of nanostructures, where 3D analysis of diffraction points is practically the only method that allows insight into the interior of transparent structures and thus quality control.