How to develop application-oriented microscope and camera systems

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In this session, you will know how to make up your own customized system for specific applications by DIY. You can integrate new other fields techs into your field .It is not difficult to modify commercially available products even if it looks high-end.
I will focus on three topics for making new things.

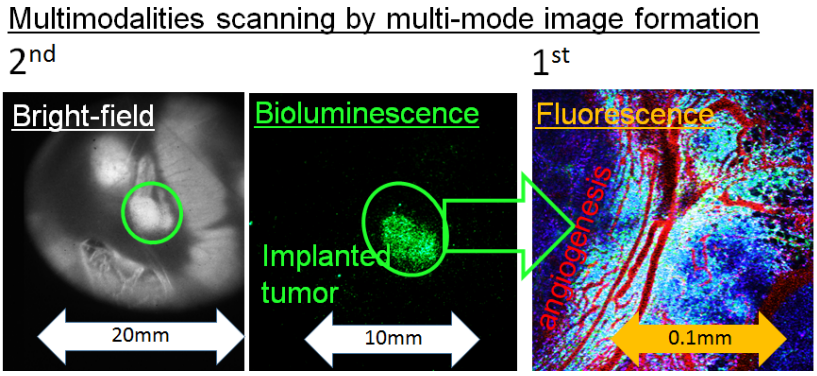
1: Utilizing CMOS sensors for microscope
2: Integration with other field technologies
3: Scalable imaging.

1: CMOS has advantage for price, pixel numbers, and dynamic ranges. High-resolution CMOS sensor enabled broad-field and high-resolution imaging by microscope. We used 4/8K CMOS sensors for broad scale in space and time, by DIY. Robotics, electronics, and semiconductor techs were integrated into one system.

2: Microscope, cytometry, digital cameras, broadcasting, cinemas, and smartphone are seamless technologies based on same optical principles. However, users, imaging devices, and systems are usually separated. I will introduce recent other fields techs not only optics but also information technologies, which can be used for microscope world. Image analysis methods including PIV for industry, and automatic 3D reconstructions for smartphone can be used also for our microscope-based biology data.

3: To cover broad scale, we also developed optical theory which can change image formation modes for commercially available microscope objective lens. We can alter zooming factors, and working distance. We integrated this system into conventional microscope, and made daily operations to be precise and much easier.

Not only spatial scales, but also dynamic ranges, and wavelengths can be broadened within one system. We utilized 1st and 2nd image formation modes in light paths. Wide-field images, fluorescent high resolution signals, and dark bioluminescence can be captured in one sample.



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