

Manufacturing plastic optical components for evaluation of freeform optics on a Fanuc Robonano ultraprecision lathe

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We have started a Research-hub-project on “**Hagen optical design and fabrication**” in “**Smart production optics**” of the CORE research projects. Our target is pointed out to connect among an optical design of freeform optics, fabrication and testing across the ultraviolet to infrared. We aim to establish a center for an optical fabrication and testing for various research fields. In optical design, we utilize various optical design software such as CODE V, Zemax, and as well as simulations like RCWA, FDTD, and VirtualLabs. In fabrication, we start to collaborate with two visiting professors who are expert of nanofabrication techniques, especially using FANUC Robonano.[1][2]

In this talk, we report two examples of plastic optical components, as a meniscus lens and a freeform mirror for compact optical testing systems. Applications of an optical resolution testing for an AR-HUD and a fish eye lens system are demonstrated using fabricated optical components.

References

[1] N.Hagen, T.Koga, R.Kuwano, Y.Otani : Manufacturing plastic lenses on a Fanuc Robonano ultraprecision lathe, The 3rd International Conference on Surface and Interface Fabrication Technologies (ICSIF), 24 (26 Mar 2021).

[2] Manning Sun, Nathan Hagen, Yukitoshi Otani : Compact MTF Measurement of Fisheye Lens, Speckle 2023 VIII International Conference On Speckle Metrology, Xian China (2023).

Short biography:



Yukitoshi OTANI is the director of Center for Optical Research and Education (CORE), a professor of Department of Optical Engineering, Utsunomiya University, JAPAN. He received his master's degree from Tokyo University of Agriculture and Technology in 1990 and his doctor's degree from the University of Tokyo in 1995. After working at HOYA Corp., he became an associate professor at Tokyo University of Agriculture and Technology until 2010, he joined the CORE from April 2010. His current interests include polarization engineering, optical measurement and optomechatronics. He is a fellow of SPIE, Optica(OSA) and The Japan Society of Applied Physics, Deputy Editors-in-Chief of Optical Review, and Precision Engineering, a board

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