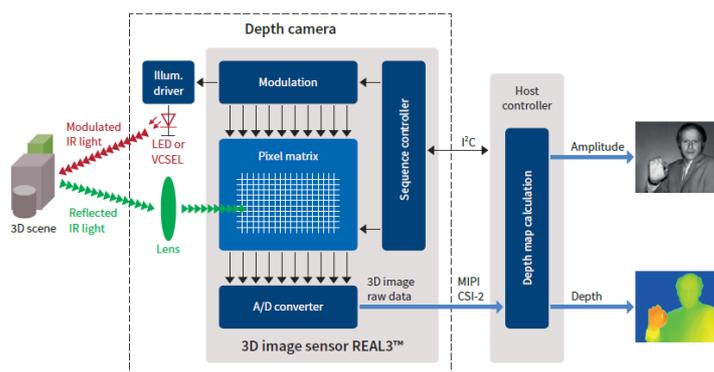




Master Thesis: Optical Stimulus System for the Validation of 3D-Imaging Sensors



Time-of-flight technology is directly measuring the depth and amplitude information in every pixel by using only one infrared flash light source. The modulated infrared light is emitted to the whole scenery and the reflected light is captured by the ToF imager. The measured phase difference between emitted and received light as well as the amplitude values are resulting into highly reliable distance information and a grey scale picture of the complete scene simultaneously. ToF based 3D-imaging cameras are considered as the next “must-have” feature for upcoming top-class and mid-class smartphones, since enabling the 3D perception of the smartphone user’s visual environment under all light conditions, even in sunlight.



TOF sensor principle of the Infineon REAL3 3D-Imaging sensor

The Sense and Control department at Infineon Graz develops the REAL3 3D imaging sensor family, where the actual product generation is already used in 3D-imaging camera modules inside first commercially available smartphones. The characterization and validation of all relevant parameters and needed functionalities is an essential part of the whole development process to ensure the high performance and highest quality level of Infineon’s semiconductor products. Throughout the characterization and validation of 3D-Imaging Sensors, well defined but special illumination conditions are needed to provide accurate optical stimuli for all sensor measurement tasks.



Infineon REAL3 imaging sensor and a 3DI camera module

The offered master thesis aims in the development of the concept, the realization, and the characterization of a new advanced optical illumination unit for the upcoming 3DI sensor products, including laser diodes, LEDs and optical components such as lenses, beam splitters, diffusers, etc.



Task Description

- › Analysis of the given problem and already existing solutions; Literature research
- › Preparation of a suitable optical system concept
- › Realization of the newly designed optical illumination unit
- › Characterization of the developed solution by conducting measurements and data analysis

Qualification

- › Master student in electrical engineering, communication technologies, technical physics, or similar
- › Excellent study record and knowledge
- › Good understanding of optics, optical components, and optical measurement technics
- › Signal Analysis, practical experience in Matlab and LabVIEW
- › Capability to work autonomously and self-motivated

We offer

- › Working contract as diploma student at Infineon (duration: 6 months)
- › Working as part of the 3D-imaging product development team at Infineon Graz

Contact

Dr. Thomas Thurner
Head of Component Verification
Infineon Technologies Austria AG
Babenberger Str. 10, 8020 Graz
+43 51777 5631
thomas.thurner@infineon.com