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Publication(s)

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External Link(s)

• [Dr. Joseph Izatt's Research Website](#)
• [Dr. Cynthia Toth's Research Website](#)

Long working distance optical coherence tomography system

Value Proposition

Optical coherence tomography (OCT) has become the standard of care for diagnosis of many retinal pathologies. However, current commercial OCT systems require a skilled technician/photographer and cooperative subjects to obtain and maintain subject alignment and fixation for several seconds in a chinrest. Handheld OCT systems have also been demonstrated for successful imaging of supine patients, as well as pre-term infants and neonates up to 1 year old. However, no technology yet exists for OCT in young children due to their lack of attention and cooperation, as well as inherent fear of strangers placing large objects close to their face. Conventional OCT systems are also unsuitable in potential applications for consumer imaging and/or screening in retail environments such as booths or shopping centers, where skilled technicians/photographers may not be available. Therefore, a novel OCT system was built with a very long working distance to facilitate imaging of such subjects.

Technology

A novel OCT system with a long working distance (distance of the last optical component of the system to the subject's eye) was built. This system will facilitate imaging of subjects under conditions when conventional tabletop or hand-held OCT systems are impractical, such as for imaging subjects in retail or consumer outlets or for imaging young children. A novel scanning configuration OCT system was designed to achieve a working distance of 35 cm to situate subjects at a comfortable distance during imaging. A 2f retinal OCT scanning configuration with a novel optical design, instead of the conventional 4f scheme, was implemented to reduce the footprint and weight of the sample arm. Swept-source OCT technology, in conjunction with GPU-based software, enabled fast volumetric imaging and real time rendering at 100 kHz A-line rate.

