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Paper Title: 3CA-FO: Budget stereoscopic 3D imaging colposcope

Authors: Nontiwat Amnuayphol, Wibool Piyawattanametha (Department of Biomedical Engineering, School of Engineering,KMITL, Thailand); Nicholas Piyawattanametha (Ruamrudee International School Bangkok, Bangkok, Thailand)

Email: wibool.pi@kmitl.ac.th

# Abstract

This research aims to develop an advanced medical device designed to enhance the diagnostic quality of conventional colposcopy. The device utilizes cutting-edge technologies, including 3D image synthesis via stereoscopic imaging and polarized glasses. The primary focus of the study is to improve cervical cancer screening by creating a highly accurate AI system for instance diagnosis, in addition to leveraging fluorescent imaging for effective screening. The research scope encompasses enhancing spatial information, The research scope involves enhancing spatial information while allowing the doctor to maintain the advantage of near vision and enabling multi-angle imaging. The hardware of the colposcope is based on the design from Duke University's 2018 research. Our 3CA-FO device is capable of providing real-time 3D imaging with precise calibration, achieved through the utilization of the Embedded Mono Calibration for Heterogeneous Lenses technique. This ensures an instantaneous and high-quality 3D output response.