PanCam - Panoramic Camera Design for the Detection of Colorectal Cancer

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Colorectal cancer (CRC) is the fourth most common type of cancer in the U.S.A. and is the third leading cause of cancer death, with an estimated 52,580 deaths in 2022. The slotted anoscope is the current gold standard for identifying and diagnosing rectal cancer, but is restricted in its ability to view the rectal zone of the colorectal system completely, limiting the endoscopist's ability to distinguish neoplastic from non-neoplastic polyps. The anoscope does not have 360° of visibility and is highly invasive. In recognition of the current need for more efficient CRC management, the objective is to develop an ergonomic panoramic imaging device that enables real-time, in vivo assessment of colonic polyp morphology using multispectral imaging and image stitching techniques. To advance the current screening procedures, our proposed project utilizes near-infrared imaging to contrast vascular networks and highlight denser morphology typical of disease progression. With the images captured by the device, gastroenterologists will be able to clearly distinguish between normal and diseased tissue for the identification and pathological prediction of CRC, anal cancer, masses, hemorrhoids, or anal fissures. This would make screening during standard rectal examinations more efficient by allowing doctors to have a more comprehensive view of the area thereby improving the safety, cost and comfort.

