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Polyp Detection in Optical Colonoscopy

Colorectal cancer is the second leading cause of cancer death in the United States and fourth worldwide. Colorectal cancer often develops from precancerous polyps which, when found early, may be easily and safely removed. Colorectal polyps are often asymptomatic and are typically detected through routine optical colonoscopy (OC) screening. While there have been many advancements in polyp detection and OC, roughly 22% of polyps still go undetected during an OC screen and 4-6% of diagnosed colorectal cancers are thought to have been missed on prior colonoscopies. Because the incidence and mortality of colorectal cancer decreases with early detection, it is important to reduce the rates of undetected polyps.

Researchers at Arizona State University in collaboration with Dr. Gurudu of the Mayo Clinic have developed two novel systems for computer-aided detection of polyps in optical colonoscopy images. The first system detects polyps by using boundary classifiers and a voting scheme to automatically identify the boundary or edge of polyps. This method was evaluated on 300 images containing 300 colorectal polyps with different shapes and scales and it detected 260 out of 300 polyps with 40 false detections. The second system uses a shape-based method and voting scheme to detect polyp boundaries in optical colonoscopy images. It is based on image appearance variation between polyps and their surrounding tissue. The second system was also evaluated on 300 images containing 300 colorectal polyps and detected 267 out of 300 polyps.

These technologies alone or together offer new and effective means to detect the boundaries of colon polyps in optical colonoscopy and subsequently reduce the polyp miss rates during routine screening.

Potential Applications

- Accurate detection of polyps in optical colonoscopy images

Benefits and Advantages

- Does not depend on global shape or texture to detect polyps
- Robust polyp localization without requiring perfect identification of whole polyp boundaries
- Can accommodate a large variation of polyp shapes
- Can accommodate a large variation of polyp sizes

For more information about the inventor(s) and their research, please see [Dr. Liang's departmental webpage](#) [Dr. Gurudu's research webpage](#)

