Scope of work (UNT)

Colorectal cancer is the second leading cause of cancer-related deaths in the US, claiming more than 50,000 lives in 2006. Colonoscopy is currently the preferred screening modality for colorectal cancer. The procedure allows a physician to inspect the mucosa or inner lining of the human colon and perform therapeutic operations such as removal of polyps, the precursor lesions of cancer, in a single procedure. Indeed, colonoscopy has contributed to a marked decline in the number of colorectal cancer-related deaths. However, recent data suggest that there is a significant (4-12%) miss-rate for the detection of even large polyps and cancers.

In 2006, the American College of Gastroenterology (ACG) and the American Society of Gastroenterology (ASGE) published consensus guidelines defining a good quality colonoscopy. The guidelines for a screening colonoscopy after age 50 in patients at average risk include: (1) a withdrawal time for patients without symptoms and with intact colon anatomy of at least 6 minutes; (2) documentation of visualization of anatomical landmarks such as appendiceal orifice and/or ileocecal valve in the cecum; and (3) an average polyp detection rate (the number of polyps detected during colonoscopy) in male and female patients greater than 25 and 15 percent respectively. No automated tools are currently available for objectively measuring and monitoring quality of colonoscopy according to or beyond the guidelines.

Specific Aim for UNT:

- We have developed novel computer algorithms that can generate quality-related metrics. We will implement and enhance the existing programs, and test their accuracy and speed.

Impact:

Successful evaluation and implementation of the proposed, automated system has the potential to improve the quality of care of over 14 million US citizens – the approximate number of people undergoing colonoscopy – on an annual basis. In addition, the technology lends itself for rapid adaptation to other endoscopic medical procedures such as upper gastrointestinal endoscopy, cystoscopy, arthroscopy and bronchoscopy.