Development of a Thermal Endoscope for ENT Clinical Diagnostics

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BACKGROUND

There is a clinical need for improved visual inspection for ENT diagnosis and surgeries. Endoscopy is required to access locations of ENT conditions. However, the assessment and identification of ENT abnormalities and pathologies remain challenging due to the difficult-to- reach ENT locations and the complex nature of the related pathologies. An imaging technique that could provide additional information, high contrast, and quantitative data about the patient condition will be useful, especially to assist ENT clinicians in diagnosis and surgeries and to avoid the need to resort to more expensive imaging techniques (e.g., CT scans, ultrasound imaging,MRI).

TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have created a thermographic system that can be integrated with endoscopes used in otolaryngology. The thermal imaging system can be directly integrated into an endoscope, or designed as an add-on attachment to existing endoscopes; in either case, the aim is to preserve normal visible-spectrum imaging function while providing thermal images of the same field of view. The add-on thermocamera/endoscopic device will access the patient's nose or mouth through a rigid or flexible tube and would image the same field of view as the visible system while recording videos of the temperature distribution. The acquired raw data would be post processed and output in 1D, 2D, 3D or as a 2D scoring system. The diagnosis can be done analyzing the processed data and the relative output metrics.

APPLICATIONS

The thermographic system could be used anywhere an endoscope is currently being used.

ADVANTAGES

There are a number of advantages that are listed below:

- Temperature distribution in space and time; Temperature as a contrast marker for lesions /abnormalities that would otherwise have low optical visibility.
- Additional imaging modality of ENT areas with sub surface detection as well as difficult to reach locations
- Access of data in post processing and output of a quantitative diagnostic pattern/metric

STATE OF DEVELOPMENT

A working prototype is in process.

INTELLECTUAL PROPERTY INFO

The invention is patent-pending and is available for licensing and collaborations.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Diagnostics, Endoscopy, ENT, Infrared Thermography, Laryngoscopy, Otolaryngology

CATEGORIZED AS

- **Medical**
  - Devices
  - Disease: Respiratory and Pulmonary System
  - Imaging
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