INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2022-2024

FGAI4H-P-025-A02

ITU-T Focus Group on AI for Health

Original: English

WG(s):	Plen	Helsinki, 20-22 September 2022

DOCUMENT

Source:	TG-Endoscopy Topic Driver	
Title:	Att.2 – CfTGP (TG-Endoscopy) [same as Meeting J]	
Purpose:	Engagement	
Contact:	Jianrong Wu Tencent Healthcare, China	Email: edwinjrwu@tencent.com

Abstract:	Calling on members of the medical and artificial intelligence communities with a vested interest in AI for Endoscopy. Become engaged in the group dedicated to establishing a standardized benchmarking platform for AI for Endoscopy within the International Telecommunication Union (ITU)/World Health Organization (WHO) Focus Group on "Artificial Intelligence for Health" (FG-AI4H).
	This version of the CfTGP is the same as seen in Meeting J (FGAI4H-J-025-A02), reproduced for easier reference as a Meeting N document.

Call for Topic Group Participation: AI for Endoscopy

The International Telecommunication Union (ITU)/World Health Organization (WHO) Focus Group on "Artificial Intelligence for Health" (FG-AI4H; https://itu.int/go/fgai4h) seeks engagement from members of the medical and artificial intelligence (AI) communities (including clinicians, technologists, entrepreneurs, potential benchmarking data providers, machine learning experts, software developers, researchers, regulators, policy-makers, companies/institutions, and field experts) with a vested interest in shaping the benchmarking process of AI for Endoscopy.

1   About FG-AI4H

Over the past decade, considerable resources have been allocated to exploring the use of AI for health, which has revealed an immense potential. Yet, due to the complexity of AI models, it is difficult to understand their strengths, weaknesses, and limitations. If the technology is poorly designed or the underlying training data are biased or incomplete, errors or problematic results can occur. AI technology can only be used with complete confidence if it has been quality controlled through a rigorous evaluation in a standardized way. Towards developing this standard assessment framework of AI for health, the ITU has established FG-AI4H in partnership with the WHO.

Thus far, FG-AI4H has established several topic groups. The topic groups are: AI and cardiovascular disease management, Dermatology, falls among the elderly, Histopathology, neurological disorders, outbreak detection, Ophthalmology, Psychiatry, snakebite and snake identification, symptom assessment, Tuberculosis, volumetric chest computed tomography, diagnosis of bacterial infection and anti-microbial resistance, dental diagnostics and digital dentistry, primary and secondary Diabetes prediction, detection of falsified medicine, Malaria detection, maternal and child health, Radiology and AI for Endoscopy.

Each topic group agrees upon representative benchmarking tasks in a pragmatic, best-practice approach, which can later be scaled and expanded to similar tasks. Every benchmarking task should

address a health problem of relevance (e.g. impacting a large and diverse part of the global population or challenging to treat) and for which AI technology would provide a tangible improvement relative to the current practice (e.g. better care, results, and/or cost/time effectiveness).

For a rigorous and sound evaluation, undisclosed test data sets must be available (or have to be collected) for each task. All data must be of high quality and compliant with ethical and legal standards. In addition, the data must originate from a variety of sources so that it can be determined whether an AI algorithm can generalize across different conditions, locations, or settings (e.g. across different people, hospitals, and/or measurement devices). The format/properties of the data serving as input to the AI and of the output expected from the AI, as well as the benchmarking metrics are agreed upon and specified by the topic group.

Finally, the AI-to-be-evaluated will be benchmarked with the undisclosed test data on FG-AI4H computing infrastructure. Here, the AI will process single samples of the undisclosed test data set and predict output variables, which will be compared with the "ground truth." The results of the benchmarking will be provided to the AI developers and will appear on a (potentially anonymized) leaderboard.

2   Topic group: AI for Endoscopy

A topic group is a community of stakeholders from the medical and AI communities with a shared interest in a topic. The objectives of the topic groups are manifold:

1.   to provide a forum for open communication among various stakeholders,

2.   to agree upon the benchmarking tasks of this topic and scoring metrics,

3.   to facilitate the collection of high-quality labelled test data from different sources,

4.   to clarify the input and output format of the test data,

5.   to define and set-up the technical benchmarking infrastructure, and

6.   to coordinate the benchmarking process in collaboration with the Focus Group management and working groups.

The primary output of a topic group is one document that describes all aspects of how to perform the benchmarking for this topic. (The document will be developed in a cooperative way by suggesting changes as input documents for the next FG-AI4H meeting that will then be discussed and integrated into an official output document of this meeting. The process will continue over several meetings until the topic description document is ready for performing the first benchmarking.)

This topic group is dedicated to AI for Endoscopy.

Endoscopy is a common inspection method for screening and diagnosis of gastrointestinal lesions. Due to the complexity of the digestive tract disease itself and the human factors that doctors operate, the high rate of missed diagnosis of endoscopy (up to 27% in the United States) means that many patients miss the best time to treat. Therefore, computer vision-based endoscopy-assisted diagnosis can help doctors accurately and consistently detect lesions in real time, thus reduce the number of missed diagnosis, especially for primary medical institutions that lack high-quality medical resources.

Using image recognition, deep learning and other artificial intelligence technologies, it can help clinicians to find colorectal polyps and identify the nature of polyps in real time, providing clinicians with real-time reminders of non-adenomatous polyps, adenomatous polyps, and adenocarcinoma. Clinicians diagnose colorectal tumours more accurately and efficiently.

It automatically detects colorectal cancer and polyps from images and videos taken during an endoscopic examination of the colon, and aids in discovery of lesions by endoscopists. It improves polyp detection, which was an issue during such exams, and increases the detection rate. In this manner, it greatly contributes to the prevention and early detection of colorectal cancer.

More details about the activities of the topic group can be found in the documents FGAI4H-I-039. These can be accessed with a free ITU account (cf. "Get involved").

Current members of the topic group on AI for Endoscopy include

Dr Jianrong Wu, Director of technical committee of Tencent Healthcare;

Man Tat Alexander Ng, Vice President of Tencent Healthcare;

Dr Tianyi Qian, Head of Tencent Miying; Dr Yanchun Zhu, Research Consultant of Tencent Healthcare.

[TBC call for participation]

The topic group would benefit from further expertise of the medical and AI communities and from additional data. Experts in endoscopy, AI, regulations, standardization or policymaking are invited to join and contribute to development of global standards for AI applications in endoscopy.

3   Get involved

To join this topic group, please send an e-mail to the focus group secretariat (tsbfgai4h@itu.int) and the topic driver (edwinjrwu@tencent.com). Please use a descriptive e-mail subject (e.g. "Participation topic group AI for Endoscopy"), briefly introduce yourself and your organization, concisely describe your relevant experience and expertise, and explain your interest in the topic group.

Participation in FG-AI4H is free of charge and open to all. To attend the workshops and meetings, please visit the Focus Group website (https://itu.int/go/fgai4h), where you can also find the whitepaper, get access to the documentation, and sign up to the mailing list.

_____