Artificial intelligence applied to digestive endoscopy

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Abstract
Introduction: In recent years, deep learning methods have improved significantly and have been implemented in fields such as medical imaging. Applying these techniques to digestive endoscopy has led diagnosis rates for entities such as polyps similar or even better than humans. *Materials and methods*: We trained a convolutional neural network to classify medical images into two categories – with polyps or with normal mucosa – using about 800 images. For scalability and accessibility reasons, the architecture was implemented into a web interface. To our knowledge, this is the first solution to emphasize the importance of scalability and accessibility. We developed an interface that can be used in real life scenarios and is easy to use, being web enabled and accessible from any device. *Results*: Experimental results show that our solution is feasible and can be implemented in clinical practice. The model was evaluated on the test set and under these circumstances the final test accuracy was 100%. One limitation is the number of images used for training. Whereas 800 images were used in total for training, only 100 contained normal mucosa and 700 contained polyps. With future research, the number of images used will be increased and data enhancement techniques will be used, alongside with endoscopy videos. *Conclusion*: In conclusion, deep learning advances can be successfully applied to biomedical fields such as digestive endoscopy for tasks such as polyp classification, with great potential of developing tools for medical professionals.

Keywords:
Artificial Intelligence; Deep Learning; Endoscopy; Colonic Polyps