Frontiers of Artificial Intelligence and Deep Learning in Endoscopy

Dr. Mihaela Luca

https://orcid.org/0000-0001-8924-3161

Institute of Computer Science, Romanian Academy - Iaşi Branch, Iaşi, Romania

Abstract

The incidence of colorectal cancers is nowadays constantly increasing, thus justifying the scientific effort of numerous research teams to early detect and eradicate any sign of malignity. The diagnosis accuracy depends on expert's training and attentiveness and on patient's preparation for the exam. Artificial intelligence might to assist the endoscopists in identifying all the polyps with a high certitude degree. The development of parallel computing and deep learning using pre-trained networks facilitate the design of real-time detection software. Particular situations in video colonoscopies might raise difficult interpretations of the selected image frames, highlighting unexpected frontiers.

Biography

Dr. Mihaela Luca (previous name Mihaela Costin) is scientific researcher III, in the Laboratory of digital images and video sequences processing "Dan Gâlea" of the Institute of Computer Science, Romanian Academy (IIT-AR), Iaşi branch, Romania. She received her Ph.D. degree from the Technical University "Gh. Asachi", Iaşi, Romania, Electronics and Telecommunication Engineering Faculty. She taught as an assistant professor image processing discipline, to the Faculty of Computer Science of the University "Alexandru Ioan Cuza", and mechatronics and artificial intelligence seminary, at the Automatics and Computer Science Faculty, Technical University "Gh. Asachi", Iasi. She co-authored two volumes on CLIPS programming language for expert systems and artificial intelligence and a book on image processing in scintigraphy. She has more than a hundred papers on the applications of artificial neural networks, fuzzy systems, soft computing models with intelligent reasoning, decision system and automatic image processing. She coordinated the "Excellence research grant" CANCERDET for IIT-AR, on breast cancer non-invasive detection. She was invited researcher of the Institute of Research in Computer Science of Toulouse (IRIT), ADRIA team, Toulouse University. The last decade was an excellent period to apply new techniques of deep learning in medical image processing and her scientific interest was focused on real-time video-colonoscopy image processing for early polyps detection. Nano-tubes automatic morphologic characterisation was also a research subject approached together with her laboratory colleagues. Dr. Mihaela Luca is also the vice-president of the Romanian Committee of History and Philosophy of Science and Technology (CRIFST), Iaşi, Romanian Academy, the editorial secretary for the NOESIS scientific review and member of the Editorial Advisory Board of the International Journal of Advanced Intelligent Paradigms (IJAIP).