Special Session 9: Explainable Machine Learning for Image Processing

Recent advancements in machine learning and image processing domains have resulted in an extensive surge of interest in Deep Neural Networks (DNNs). This is mainly due to their unprecedented performance and high accuracy for different and challenging image processing problems of significant engineering importance. In all such applications, it is of paramount importance to understand, trust, and in one word "explain" the rationale behind deep models' decisions especially when such deep learning architectures are utilized for making critical decisions such as the ones that involve human lives (e.g., in control systems and medical imaging applications). Although different efforts have been initiated recently to explain behaviour and decisions of deep networks, explainable artificial intelligence (XAI) domain, which aims at reasoning about the behaviour and decisions of DNNs, is still in its infancy. The objective of this special session is to collect novel ideas and innovative solutions that: (i) Augment interpretable capabilities of DNNs; (ii) Provide explanation on the internal and overall behaviour of different DNN architectures (e.g., Convolutional Neural Networks (CNNs), Generative Adversarial Networks (GANs), and Capsule Networks); (iii) Interpret properties of the input that lead to a specific output, and; (iv) Provide intuitive rationales behind the decisions made by DNNs.

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