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Capsule Based Networks, Next Evolution of Convolutional Neural Networks?

ABSTRACT
Deep convolutional neural networks (CNNs), assisted by architectural design strategies, make large use of data augmentation techniques and layers with a high number of feature maps to embed object transformations. That is highly inefficient and for large datasets implies a massive redundancy of features detectors. Even though capsule networks are still in their infancy, they constitute a promising solution to extend current convolutional networks and endow artificial visual perception with a process to encode more efficiently all feature affine transformations. Are they going to be the next evolutionary step for CNNs?

BIOGRAPHY
PhD student in Electrical, Electronics and Communications Engineering working with the two Interdepartmental Centres PIC4SeR and SmartData. He received the master’s degree in Mechatronics Engineering from the Politecnico di Torino, presenting a thesis entitled “Use of deep learning for automatic low cost detection of cracks in tunnels”, developed in collaboration with the California State University.

His current research interests involve deep learning applied to different tasks of computer vision, autonomous navigation for service robotics and reinforcement learning. Moreover, making use of neural compute devices (like Jetson Xavier, Jetson Nano, Movidius Neural Stick) for hardware acceleration, he is currently working on machine learning algorithms and their embedded implementation for AI at the edge.