

Deep Learning-Based Multiple Object Visual Tracking on Embedded System for IoT and Mobile Edge Computing Applications

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Abstract Compute and memory demands of state-of-the-art deep learning methods are still a shortcoming that must be addressed to make them useful at IoT end-nodes. In particular, recent results depict a hopeful prospect for image processing using Convolutional Neural Networks, CNNs, but the gap between software and hardware implementations is already considerable for IoT and mobile edge computing applications due to their high power consumption. This proposal performs low-power and real time deep learning-based multiple object visual tracking implemented on an NVIDIA Jetson TX2 development kit. It includes a camera and wireless connection capability and it is battery powered for mobile and outdoor applications. A collection of representative sequences captured with the on-board camera, dETRUSC video dataset, is used to exemplify the performance of the proposed algorithm and to facilitate benchmarking. The results in terms of power consumption and frame rate demonstrate the feasibility of deep learning algorithms on embedded platforms although more effort in the joint algorithm and hardware design of CNNs is needed.

LIGAZÓNS

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