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Abstract

We explore recurrent encoder multi-decoder neural network architectures for semi-supervised sequence classification and reconstruction. We find that the use of multiple reconstruction modules helps models generalize in a classification task when only a small amount of labeled data is available, which is often the case in practice. Such models provide useful high-level representations of motions allowing clustering, searching and faster labeling of new sequences. We also propose a new, realistic partitioning of a well-known, high quality motion-capture dataset for better evaluations. We further explore a novel formulation for future-predicting decoders based on conditional recurrent generative adversarial networks, for which we propose both soft and hard constraints for transition generation derived from desired physical properties of synthesized future movements and desired animation goals. We find that using such constraints allow to stabilize the training of recurrent adversarial architectures for animation generation.

Keywords: Action Recognition, Motion Capture, Semi-supervised Learning, Recurrent Neural Networks, Generative Adversarial Networks, Transition Generation

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