Video Soft Colour Segmentation

Johanna Barbier, Master of Science in Computer Science

University of Dublin, Trinity College, 2018

Supervisor: Aljosa Smolic

This dissertation explores the extension of a state-of-the-art image-based soft colour segmentation into the video domain. The objective is to design an automatic video soft colour segmentation that decomposes an input video into a set of colour layers with transparency channels. The output layers have to be spatially and temporally coherent. To answer this objective, the implemented method is divided into two parts: a layer initialisation technique using optical flow to provide temporal information, and a colour model estimation to correctly represent the current frame colour distributions. This method is evaluated on the Blender Sintel animated movie in terms of temporal smoothness, reconstruction error and time performance. While the layer initialisation technique yields unexpectedly poor results, it uncovers a transparency diffusion behaviour of the original image-based segmentation. As for the colour model estimation, fixing the colour model on detected video cuts produces temporally coherent output layers and speeds up the video segmentation process.