



Guest Editorial: Special Issue on Computer Vision from 2D to 3D

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This special issue presents extended versions of the best papers from BMVC 2020. We invited the authors of 19 papers to submit significant extensions of their BMVC papers for consideration. These papers were chosen based on a combination of their original review scores, prize nominations by reviewers and further review by the guest editors. After peer review, following the usual rigorous IJCV process, we have accepted 9 papers for this special issue. They represent the full breadth of computer vision, from 2D to 3D, and, unsurprisingly, all are underpinned by some form of machine learning.

In “Generative Sketch Healing”, the authors take inspiration from the human visual system. They show how to train a model that replicates a human’s ability to perceive and create a whole sketch from incomplete parts. Several papers advance the underlying architectures of machine learning models. In “Few-Shot Learning with Complex-valued Neural Networks and Dependable Learning”, the authors propose convolutional neural networks (CNNs) that operate on complex-valued quantities and train with a new Dependable Learning paradigm for the purposes of few-shot learning. In “Delving Deeper into Anti-aliasing in ConvNets”, the authors study the important problem of sampling in

convolutional architectures, proposing an adaptive content-aware low-pass filtering layer to deal with anti-aliasing. In “Bipartite Graph Reasoning GANs for Person Pose and Facial Image Synthesis”, the authors propose a Bipartite Graph Reasoning block to model long-range cross relations for the purposes of image synthesis.

Two papers dealt with the problem of segmentation. In “SegMix: Co-occurrence Driven Mixup for Semantic Segmentation and Adversarial Robustness”, the authors tackle the problem of resolving competing hypotheses in the task of dense semantic segmentation. In “Video Region Annotation with Sparse Bounding Boxes”, the authors tackle the limited availability of densely-labelled data in video by showing how to transform labelled sparse bounding boxes into dense region boundaries.

Three papers tackle various settings of the 3D reconstruction problem. In “DESC: Domain Adaptation for Depth Estimation via Semantic Consistency”, the authors tackle the problem of monocular depth estimation by posing it as a domain transfer problem from annotated to unannotated dataset using semantic consistency to bridge the gap. In “A CNN Based Approach for the Point-Light Photometric Stereo Problem”, the authors tackle the problem of near field photometric stereo, using a CNN to predict surface normals from reflectance samples. Finally, in “Vis-MVSNet: Visibility-aware Multi-view Stereo Network”, the authors take a learning-based approach to multiview stereo that explicitly accounts for pixel-wise visibility.

BMVC 2020 took place at the height of the COVID-19 pandemic. The conference had to be moved online at very short notice, requiring a huge amount of last minute planning and work from the organisers but also the wider community. The fact that the conference was still such a success, as evidenced by this selection of such high quality papers, is testament to the computer vision community pulling together in difficult circumstances. The guest editors would like to pay particular thanks to Neill Campbell who took on the majority of the organisational burden.

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