

Preface

This volume contains the final version of the papers originally presented at the second SMILE workshop *3D Structure from Multiple Images of Large-scale Environments*, which was held on 1-2 July 2000 in conjunction with the *Sixth European Conference in Computer Vision* at Trinity College Dublin.

The subject of the workshop was the visual acquisition of models of the 3D world from images and their application to virtual and augmented reality. Over the last few years tremendous progress has been made in this area. On the one hand important new insights have been obtained resulting in more flexibility and new representations. On the other hand a number of techniques have come to maturity, yielding robust algorithms delivering good results on real image data. Moreover supporting technologies—such as digital cameras, computers, disk storage and visualization devices—have made things possible that were infeasible just a few years ago.

Opening the workshop was Paul Debevec's invited presentation on *image-based modeling, rendering and lighting*. He presented a number of techniques for using digital images of real scenes to create 3D models, virtual camera moves, and realistic computer animations. The remainder of the workshop was divided into three sessions: *Computation and Algorithms*, *Visual Scene Representations* and *Extended Environments*. After each session there was a panel discussion that included all speakers. These panel discussions were organized by Bill Triggs, Marc Pollefeys and Tomas Pajdla respectively, who introduced the topics and moderated the discussion.

A substantial part of these proceedings are the transcripts of the discussions following each paper and the full panel sessions. These discussions were of very high quality and were an integral part of the workshop.

The papers in these proceedings are organized into three parts corresponding to the three workshop sessions. The papers in the first part discuss different aspects of *Computation and Algorithms*. Different problems of modeling from images are addressed – structure and motion recovery, mosaicing, self-calibration and stereo. Techniques and concepts that are applied in this context are frame decimation, model selection, linear algebra tools and progressive refinement. Clearly, many of these concepts can be used to solve other problems. This was one of the topics of the discussion that followed the presentation of the papers.

The papers in the second part deal with *Visual Scene Representations*. Papers here deal with concentric mosaics, voxel coloring, texturing and augmented reality. In the discussion following the presentation of these papers different types of representation were compared. One of the important observations was that the traditional split between image based and geometry based representations is fading away and that a continuum of possible representations exist in between.

The papers in the last part are concerned with the acquisition of *Extended Environments*. These present methods to deal with large number of images, the use of special sensors and sequential map-building. The discussion concentrated on how visual repre-

sentations of extended environments can be acquired. One of the conclusions was the importance of omnidirectional sensors for this type of applications.

Finally we would like to thank the many people who helped to organize the workshop, and without whom it would not have been possible. The scientific helpers are listed on the following page, but thanks must also go to David Vernon, the chairman of ECCV 2000, for his tremendous help in many areas and for organizing a great conference; for the student helpers at Trinity College and in Leuven and for the K.U. Leuven and the ITEA99002 BEYOND project for acting as sponsors of this workshop.

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Andrew Zisserman	University of Oxford
Andrew Fitzgibbon	University of Oxford

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