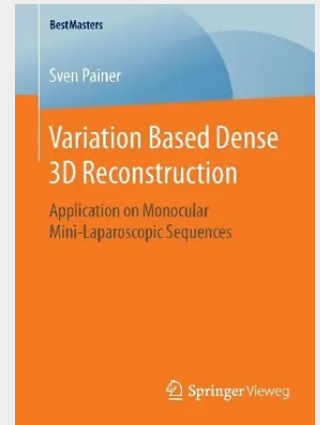


Variation Based Dense 3D Reconstruction

Application on Monocular Mini-Laparoscopic Sequences

In his master thesis, Sven Painer develops, implements, and evaluates a method to reconstruct the liver surface from monocular mini-laparoscopic sequences. The principal focus of his research is to create a basis for helping clinicians to write reports with quantitative descriptions of the liver surface. A Structure from Motion approach is performed to do a sparse reconstruction of the liver surface and subsequently this information is used in a variation based dense 3D reconstruction. The algorithms are formulated in a causal way, enabling the implementation to be run in real-time on an adequate hardware platform. The results show a significant performance increase and pave the way to give clinicians a feedback during video capturing to improve the quality of the reconstruction in the near future.

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