

# Accelerated Epipolar Geometry Computation For 3D Reconstruction Using Projective Texturing

Rui Rodrigues

António Ramires Fernandes

Universidade do Minho, Portugal

## Abstract

The process of 3D reconstruction, or depth estimation, is a complex one, and many methods often have several parameters that may require fine tuning to adapt to the scene and improve reconstruction results. Usability of these methods is directly related to their response time.

Epipolar geometry, a fundamental tool used in 3D reconstruction, is commonly computed on the CPU.

We propose to take advantage of the advances of graphic cards, to accelerate this process. Projective texturing will be used to transfer a significant part of the computational load from the CPU into the GPU.

The new approach will be illustrated in the context of a previously published work for 3D point reconstruction from a set of static images.

Test results show that gains of up to two orders of magnitude in terms of computation times can be achieved, when comparing current CPU's and GPU's.

We conclude that this leads to an increase in usability of 3D reconstruction methods.