

Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences de l'Ingénieur

Monsieur Cédric VERLEYSEN
Master ingénieur civil électricien

3D estimation and view synthesis in wide-baseline stereo

Nowadays, when viewing a pre-recorded video content, the spectator's viewpoint is restricted to one of the cameras that have recorded the scene. To improve the viewer's experience, the next generation of video content aims at enabling him/her to interactively define his/her viewpoint. This domain is known as view synthesis and consists in the interpolation of images that would be seen from a different viewpoint than the ones captured by real cameras. However, the current solutions require that the real cameras share very similar viewpoints, which limits the range of synthesized views. To circumvent this issue, this thesis focuses on the view interpolation when only two real cameras observe the scene from very different viewpoints. This minimalist and challenging camera configuration, called *wide-baseline* stereo, makes the view synthesis and its underlying 3D estimation problem ill-posed, *i.e.*, multiple reconstructed views are possible. This thesis proposes three new priors to address the problem.

The first contribution proposes an energy minimization framework to favor the preservation of the order of the elements in the scene while changing the viewpoint.

The second contribution assumes the piecewise-planarity of the scene's background and approximates its 3D by a set of 3D planes under sparsity and smoothness constraints.

The last contribution considers the view synthesis of dynamic foreground objects. It first learns a prior about plausible 2D silhouettes of the object based on non-linear dimensionality reduction of their shape descriptors. Afterwards, it constrains the interpolated views to be consistent with this shape prior.

Mardi 3 novembre 2015 à 17h00

Auditoire BARB 92
Place Sainte Barbe
1348 Louvain-la-Neuve



Membres du jury :

Prof. Christophe De Vleeschouwer (UCL), promoteur
Prof. Jean-Pierre Raskin (UCL), président
Prof. Laurent Jacques (UCL), secrétaire
Prof. Pascal Frossard (EPFL, Suisse)
Prof. Gauthier Lafruit (ULB)
Prof. Luc Van Gool (ETHZ, Suisse)