

ED STIC - Proposition de Sujets de Thèse
pour la campagne d'Allocation de thèses 2011

Titre du sujet :

Mention de thèse :

HDR Directeur de thèse inscrit à l'ED STIC :

Co-encadrant de thèse éventuel :

Nom :

Prénom :

Email :

Téléphone :

Email de contact pour ce sujet :

Laboratoire d'accueil :

Description du sujet :

In this thesis we will develop ways to represent variations in appearance (texture, BRDF's) which are compact and have intuitive parameters.

In current state of the art, despite compact representations such as procedural models, and -- for some classes of algorithms -- neighborhood-based techniques, their expressivity may be limited, or the parameters required may be hard to control.

In this thesis, we will investigate include procedural representations, or neighborhood-based texture-synthesis methods which can encode large varieties of texture or lighting conditions. We will also investigate sparse coding techniques for the representation of texture and materials. We will investigate different types of noise functions, as well as optimization/neighborhood search based techniques and new and efficient ways to store and evaluate them.

Once we have defined these representations, we will investigate novel interaction techniques, with a dual goal in mind: (a) allow the user to create desired appearances more easily and (b) optimize the storage and computational cost of the representation by indicating which part is required and which is redundant, thus guiding the optimizations used for the coding. This will also involve using perceptual principles to determine appropriate parameterizations for appearance. This thesis will be in collaboration with partners working on interactive techniques and on perceptual principles for graphics.

The first goal of this thesis is thus to develop compact and effective codings for appearance, permitting easy manipulation to create variety. The second goal is to develop appropriate interfaces to (a) allow these codings to be easily manipulated, (b) develop more efficient representations.

URL : <http://www-sop.inria.fr/reves/Stages/2011/PhD-AppearanceCoding.pdf>

English version:

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