3D Material Style Transfer

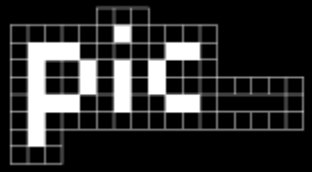
Chuong H. Nguyen[1] Tobias Ritschel[2] Karol Myszkowski[1] Elmar Eisemann[2] Hans-Peter Seidel[1]

[1]MPI Informatik [2]Télécom ParisTech

Presented by Pedro Mendes

PIC Weekly Presentations

08/11/2012



MOTIVATION

- System that extract materials from a source image or video to a target 3D scene

MOTIVATION

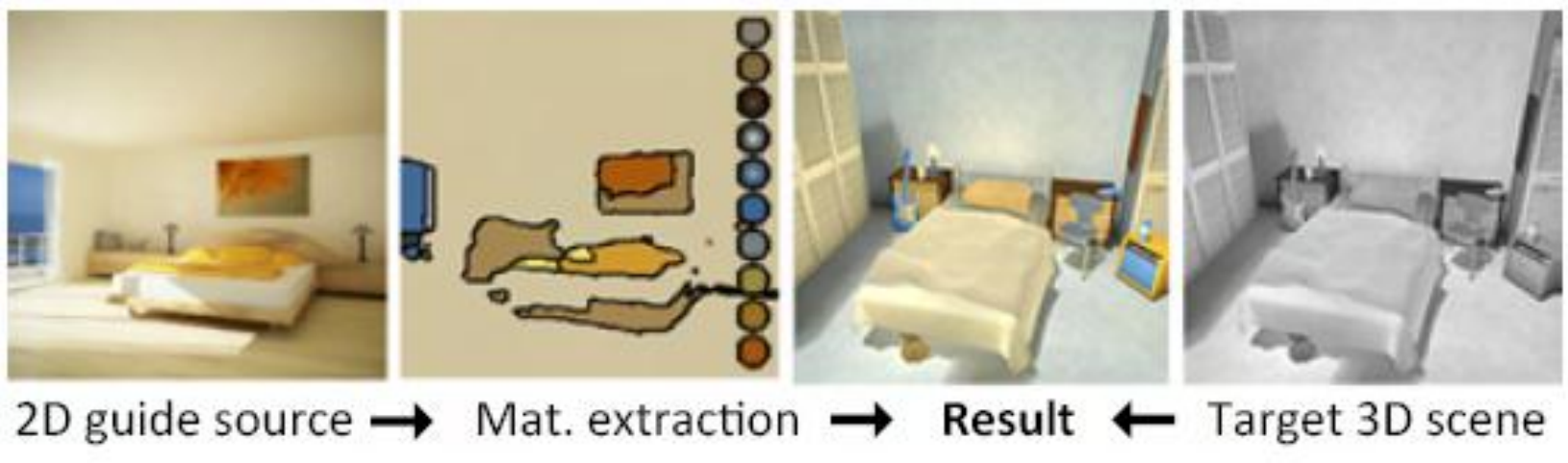
- A lot a problems in choosing and creating materials for 3D scenes:
  - Large databases of materials;
  - Manual assignment is tedious;
  - High number of objects;
  - It is not an obvious choice;

METHOD

Material Extraction

Material Assignement

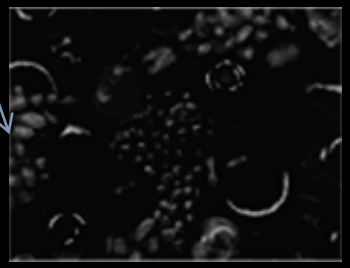
Optimization



MATERIAL EXTRACTION

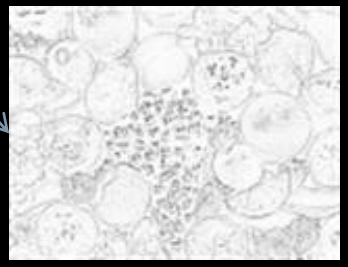
Input

Diffuse Radiance

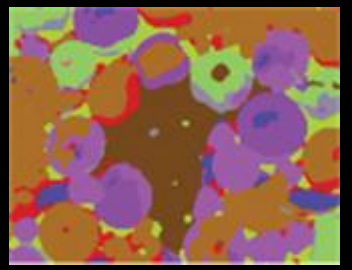


Specular Radiance

Diffuse Base Reflectance



Diffuse Texture Reflectance



Segmentation

Materials

MATERIAL EXTRACTION

- The different materials have information about color, texture and shape.
- It is possible to have more materials than the desired in the scene.
- To solve that problem, the materials are clustered into the desidered number of materials.

MATERIAL ASSIGNEMENT

- Optimizes a cost function, that considers:
  - view-dependent image cost
  - view-independent geometric cost

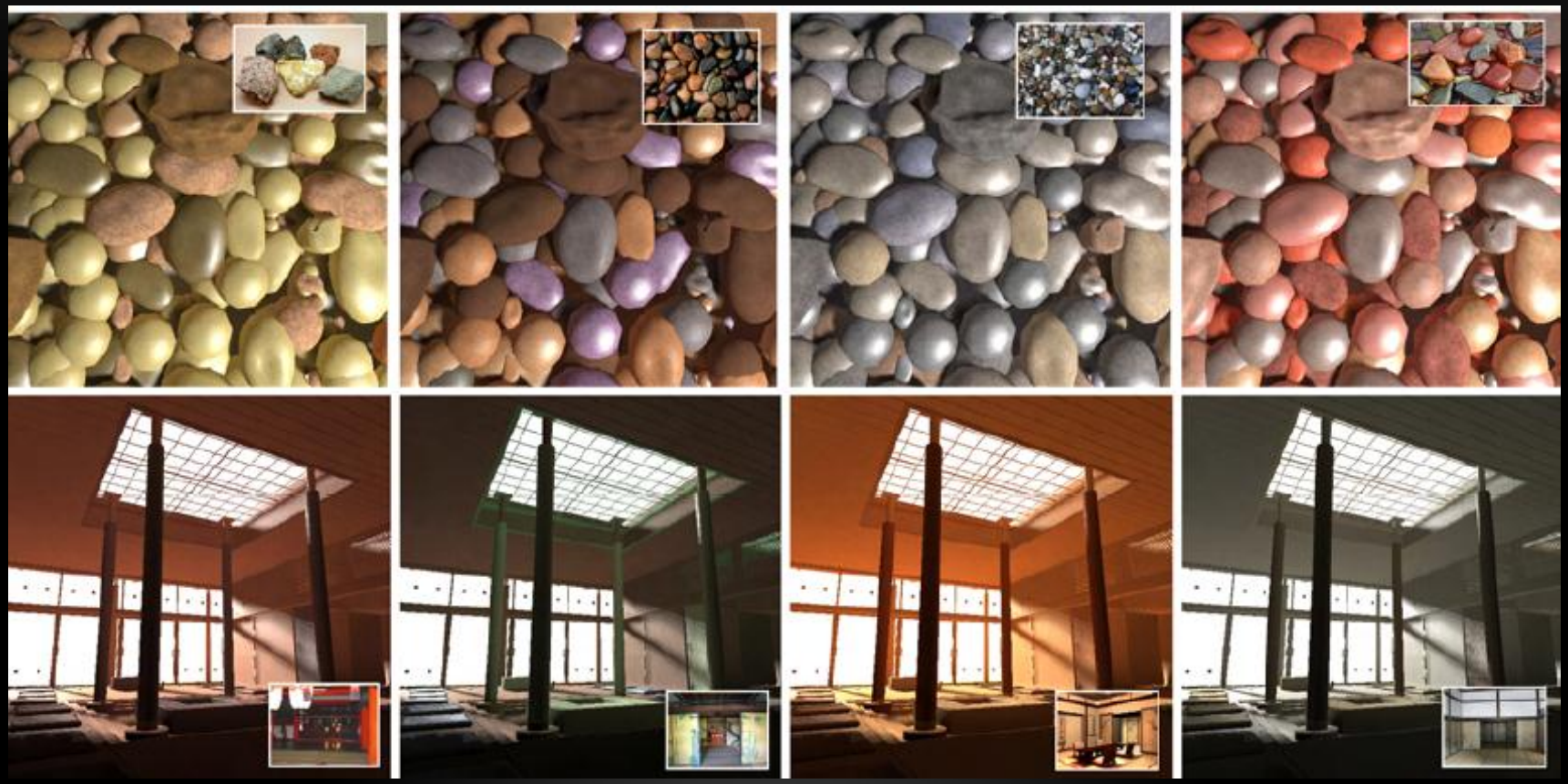
- View-dependent image cost
  - Compare the color and texture of the materials with a set of rendered images of the scene

- View-independent geometric cost
  - Compare the shape of the material with the shpe of the objects in the scene
  - (not the shape of the rendered scene)

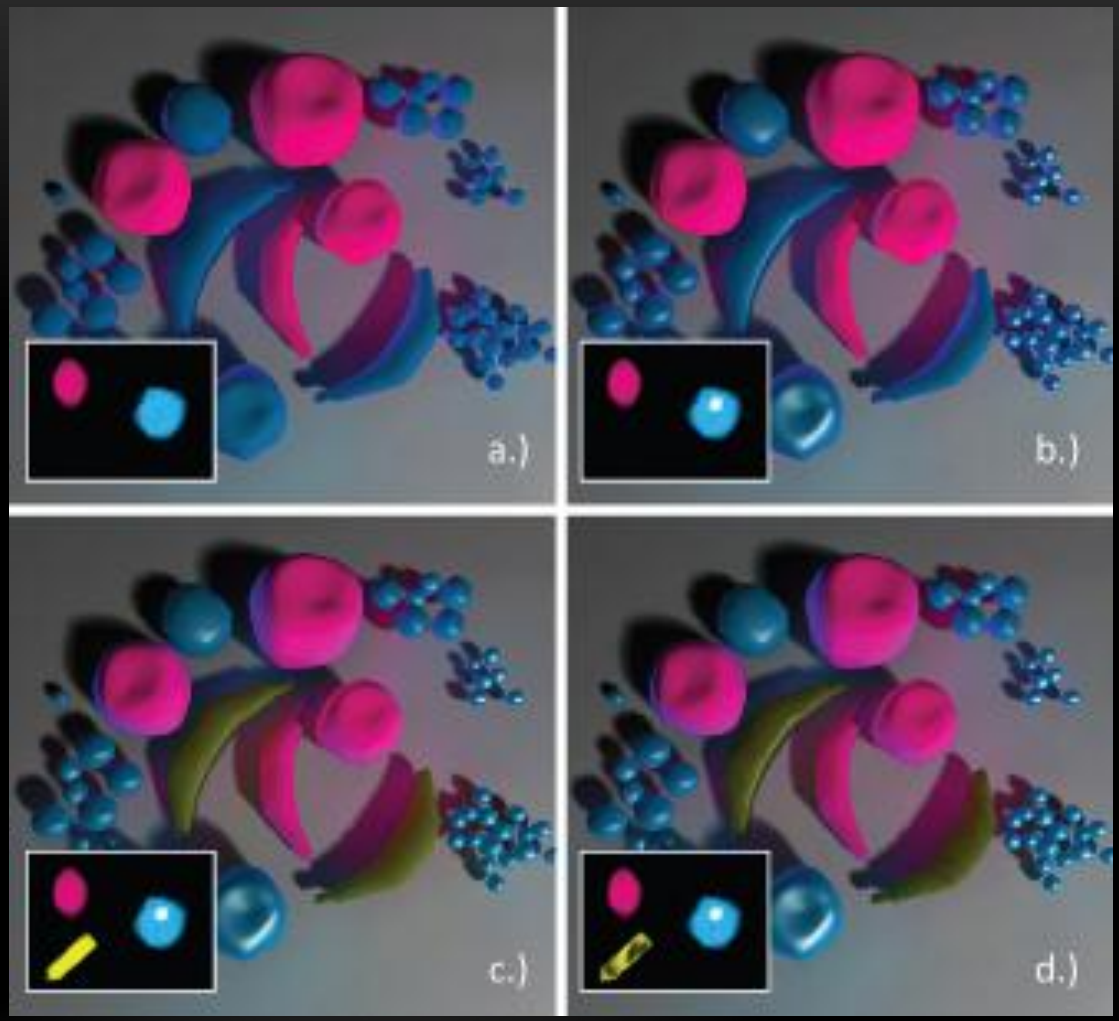
MATERIAL ASSIGNEMENT

RESULTS

RESULTS



RESULTS



CONCLUSIONS

- Better results with:
  - Neutral directional ligth
  - Similarities between source and target.

- The system has problems with the optimization of image and geometry cost function.

- The system can capture materials highlights and diffuse detail textures and apply them to a target scene.

THANK YOU