中法信息、自动化与应用数学联合实验室（LIAMA）是中国科学院与法国国家信息与自动化研究院（INRIA）于 1997 年 1 月共同建立的联合实验室，2008 年被授予国家级国际合作研究中心。该实验室坐落在中国科学院自动化研究所。实验室计算机图形学课题组（同时隶属模式识别国家重点实验室）因科研工作需要，目前面向各高校招收访问学生，要求能够稳定工作半年以上，由中法双方研究员共同指导。课题组将按照本所研究生的标准提供实习津贴和奖金，表现优异的同学可获得赴法交流的机会，若在高水平国际会议上发表论文课题组也将提供出国费用。
有意向的同学请将简历发送至 xpzhang@liama.ia.ac.cn 和 wmdong@liama.ia.ac.cn，若曾经发表过学术论文也请选择 1-2 篇随简历发送。
项目相关信息描述见下方。

Context

The project is a cooperation between CASIA (Institute of Automation, Chinese Academy of Sciences), INRIA (The French National Institute for Research in Computer Science and Control) and animation movie making companies. We aim at developing new tools for improving special visual effects in computer animation products or movies (both 2D and 3D). The final results of the project will be high-level papers and prototype software.

Description of the research projects

Project 1: Advanced geometry analysis and processing
Geometry processing is a very important and fundamental topic in computer graphics. Typical geometric representations such as point cloud, meshes, and volume data, are intensively used in industrial applications of reverse engineering, product design and computer animation. How to make the computer understand the shape of geometric models is a great challenge. The goal of this project is to develop new and efficient methods of geometry analysis and processing, capturing the intrinsic geometry characteristics of a given model, and then to develop a tool for its applications. The problem will be studied under different directions:
1) Multiresolution surface reconstruction from large point cloud;
2) Feature-based parameterization and remeshing;
3) Semantic geometry analysis and applications such as segmentation and non-photorealistic rendering.

Project 2: Content-aware image synthesis and analysis

Image synthesis is a hot topic in computer graphics and image processing. It is a very effective way in image acquisition and editing. Image synthesis can be used in graphic design, movie post-processing, realistic rendering and many other applications. In this context, the goal of this project is to develop new image synthesis methods, by analyzing the content of the source image (color, lighting, texture and other necessary features), which should be integrated into energy functions. Optimization algorithm will be constructed by studying the connections between image content analysis and the synthesis process. Different algorithms will be studied according to the specific visual effects. The problem will be studied under different directions:

1) Feature-based texture synthesis;
2) Content-aware photo/video editing;
3) Painterly stylization of images and videos.

Advisors

Prof. Xiaopeng Zhang
LIAMA-NLPR, CAS Institute of Automation
http://liama.ia.ac.cn/zhang

Dr. Weiming Dong
LIAMA-NLPR, CAS Institute of Automation
http://liama.ia.ac.cn/wiki/user:dong:home

Dr. Wujun Che
LIAMA-NLPR, CAS Institute of Automation

Prof. Jean-Claude Paul
INRIA, France
http://liama.ia.ac.cn/wiki/doku.php?id=user:jcp:home

Working conditions

The working place is the CASIA main building in Beijing, in the computer graphics team of LIAMA-NLPR. The student will benefit from the status and work conditions offered by CASIA and national projects (NSFC and 863). Monthly allowance and bonus are offered.

Prerequisites

Major in computer science, applied mathematics or applied physics (hydrodynamics or optics). The student should have skills in both fields; a good background in computer graphics or image processing, numerical analysis, statistics, algorithmic is desirable. Programming will be done in C++/OpenGL/DirectX.