学术报告会

时　间：9月14日(周五) 10:00

地　点：电院群楼2-410会议室

Digital 2D template design
from 3D models using mesh unfolding

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Abstract:

In many applications such as medical applications, one often needs to convert 3D information to 2D information. This talk addresses how to design 2D templates from 3D models. More precisely, the talk focuses on the problem of nose reconstruction by using digital 2D template derived from unfolding 3D nose meshes. The proposed method mesh unfolding framework takes as input a target digital nose model represented by a 3-D triangle mesh and unfolds the nasal mesh under structure constraints using semidefinite programming. The solution of the unfolding problem is in the form of a Gram matrix from which the 2-D representation of the 3-D model, or embedding, is extracted. The embedding defines a digital template representing the skin requirement for nasal reconstruction, which can in turn be used to produce a physical 2-D template to apply on the donor site for guiding skin incision. Experiments on synthetic data demonstrate the effectiveness of the proposed unfolding approach, and results on real data show the feasibility of generating physical 2-D skin templates from 3-D nose meshes. The proposed approach efficiently converts 3-D nose models to digital 2-D skin templates for fast easy and accurate preparation of physical templates and can be useful for other plastic surgery tasks.

Biography:

Mr. Yuemin Zhu received his M.Sc. degree in 1984 and Ph.D. in 1988 from the INSA (Institut National des Sciences Appliquées), Lyon, France. He also obtained the "Habilitation à Diriger des Recherches" (博导) in 1993, France. He is a permanent professor at the CNRS (Centre National de la Recherche Scientifique) of France. He is currently principal investigator of several research projects on medical imaging. His research interests include image modeling, simulation, representation, reconstruction, correction, denoising, registration, segmentation, visualization, and fusion. He is the author and co-author of more than 220 publications including those in IEEE Trans. on Image Processing, IEEE Trans. on Medical Imaging, IEEE Trans. on ASSP, IEEE Trans. on Nuclear Science, IEEE Trans. on Instrumentation and Measurement, IEEE Trans. on Biomedical Engineering, Medical Image Analysis, MRM, JMRI, IPMI, MICCAI, etc.