Structure-Aware Computational Art Synthesis via GPU Parallelism

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Abstract
Computational art synthesis as an expressive way for producing user-desired appearances has received much attention in creative media researches. In interactive design, it would be powerful to re-render the stylized presentation of interested objects virtually using computer-aided design tools for artistic effects generation and synthesis. However, the existing stylization and painterly rendering methods focused on artistic restyling directly in the field of RGB space considering little for the detailed salient structures of the input images, which unavoidably results in salience information loss. In this talk, we focused the structure-aware computational art synthesis on efficient stylization, perceptual mosaic, and face sketch synthesis. We present a real-time abstract stylization that preserves the fine structure in the original images using gradient optimization. Further, we introduce a GPU-accelerated perceptual mosaic using density tiles replacement and brightness lighting optimization, keeping original image structure details and providing more expressive visual effects. In addition, we present a face sketch synthesis via deep neural network feature maps guided optimization. Our results accurately capture the sketch drawing style and make full use of the whole stylistic information hidden in the training dataset.

About the Speaker
Dr Ping Li is an Assistant Professor at the Macau University of Science and Technology, who obtained his Ph.D. from The Chinese University of Hong Kong. He is also a Visiting Professor at Peter the Great St. Petersburg Polytechnic University. He was a Lecturer (academic track) at The Education University of Hong Kong. He has 2 image/video processing national invention patents, and has excellent project reported worldwide by ACM TechNews. Besides, he has won many Best Paper Awards, Best Presentation Award, the First Prize of the U.S. mathematical contest in modeling, the First Runner-Up Award in the Postgraduate Paper Contest of IEEE (HK), the First Prize in Hubei Natural Sciences Outstanding Academic Paper Award, the Silver Award of Asia Regional Award in Reimagine Education 2015, and guided the CUHK students to get the IBM Inter-University Programming Contest Champion and 2nd Runner-Up Awards (Twin Wins). He has published around 100 top-tier graphics and visualization papers refereed, including IEEE TVCG, TIP, TCSVT, TCYB, TBME, TSMC, TII, ACM SIGGRAPH VRCAI.

ALL are welcome!
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