

## Fact Sheet – Courses

Chair	:	Michael Brown, National University of Singapore, Singapore
Co-Chair	:	Jiaya (Leo) Jia, Chinese University of Hong Kong, Hong Kong
Conference	:	Wednesday 28 November – Saturday 1 December 2012
Exhibition	:	Thursday 29 November – Saturday 1 December 2012

### Fast Facts

The SIGGRAPH Asia 2012 Courses Program received 22 submissions. In addition, four submissions were invited. Overall, a total of 17 courses have been accepted. The Courses Jury Committee was drawn from a wide range of academic and industry sectors, including Bungie, EonReality, Intel, Nanyang Technological University, NVIDIA, Oregon State University and Pixar.

At SIGGRAPH Asia 2012, the Courses program will feature a variety of instructional sessions from introductory to advanced topics in computer graphics and interactive techniques by speakers from institutions around the globe. Practitioners, developers, researchers, artists, and students will attend Courses to broaden and deepen their knowledge of their field, and to learn the trends of new fields.

### Quote from the SIGGRAPH Asia 2012 Courses Chair, Michael Brown, National University of Singapore, Singapore

"This year the SIGGRAPH Asia 2012 Course program has a great spread of themes for both sides of the brain with an excellent mix of artistic focused courses and technical oriented courses. Our course organizers are from all over the world and many are coming from the top industries in computer graphics and animation, including Disney, Pixar, DreamWorks, and AMD."

### SIGGRAPH Asia 2012 Courses highlights include

- ***Taming Render Times at Pixar: CPU & GPU, Brave and Beyond***  
Paul Kanyuk, Pixar Animation Studios  
Laurence Emms, Pixar Animation Studios

Despite the exponential growth of computing performance and steady march of algorithmic improvements over the years, the images produced by feature animated film studios like Pixar still take as long as ever to render. You can bet every minute saved is spent by artists to create ever more detailed and stunning imagery, but even these savings can't match demands of modern graphics quality and techniques by themselves. Learn the Behind The Scenes tales and techniques of the engineers and artists at Pixar who labor to bring even the most detailed and complex imagery into the realm of computability, and measure their success in CPU time, FPS, disk space, and RAM. These Render Speed and Global Tech Technical Directors are the unsung heroes who don't add any pixels to final frames themselves, but make it so those pixels can be added by artists with as much efficiency as possible, to facilitate creative iteration and met deadlines. This course will explain some of the challenges faced, and techniques developed for render optimization at Pixar both offline and interactive, for CPU and GPU, with the hopes that they can help other Technical Directors as they fight their own rendering battles.

- ***Recent Advances in Physically-Based Appearance Modeling of Cloth***  
Kai Schröder, University of Bonn  
Shuang Zhao, Cornell University  
Arno Zinke, TeamUp

This course is about recent advances in the challenging field of physically-based appearance modeling of cloth. Apart from geometrical complexity, optical complexity presents complications as highly anisotropic single and multiple scattering effects often dominate the appearance. Many types of fibers are highly translucent and multiple scattering significantly influences the observed color. Understanding light scattering from fibers is essential, when a physically-based cloth renderer is designed. Explicit representations of micro-geometry are often too costly. Therefore, more efficient statistical descriptions of cloth have been proposed that can be used together with volumetric rendering techniques to allow for physically-based image synthesis while retaining most of the flexibility of explicit methods. A major part of this course will focus on these approaches. The theory and practice of physically-based rendering of anisotropic media is discussed. The day begins with a review of linear transport theory, upon which current methods for rendering volumetric cloth are based. Relevant implementation details are discussed at each stage, and the final result will be the pseudo-code of a Monte Carlo path tracer for volumetric cloth representations. Although rendering of cloth is a very specialized task, many of the concepts developed in this context can be used for other materials with complex micro-geometry as well.

- ***Designing an Artful Stereoscopic Experience for Disney Toon Studio's The Secret of the Wings***  
Vladimir Sierra, John Park, and Jason Carter, Disney Toon Studios

The Secret of the Wings is the fourth instalment of Disney's successful all-CG Fairies franchise featuring Tinker Bell and her friends as they journey into the forbidden world of the Mysterious Winter Woods.

During this half-day course, the implementation of a stereographic pipeline at Disney Toon Studios to artfully compliment the artistic vision set out for the film The Secret of The Wings. Through a description of the key concepts in stereo design, this course aims to provide a thorough understanding of stereo from an artistic, technical, and production perspective. Because the majority of the tools developed for this film were created using Autodesk Maya tools, the technical aspects of this course will be illustrated through this lens, but the concepts will be applicable to the making of CG films in general.

- ***Previsualisation in Film. Assisting filmmakers in realizing their vision***  
Hock Wong, DreamWorks Animation

This Previs course will be an introductory lesson targeting Directors, VFX Supervisors, Producers, Artists of all levels and specialties to visualise complicated sequences before they're being shot. Previz Artists work with the Directors in realising their creative visions. Previs can also be used for other purposes such as for Producers to pitch (pitch-vis) their movies to studio executives, help the Art Department to design how a character moves and look, or as a tool for the VFX teams to design methods and tools to create the VFX for a movies.

Previz is most widely used to assist the Directors to visualise the scenes in a movie before production begins. Most previz requires basic computer graphic skills, but one has to have good cinematography knowledge, understanding of staging, color theory, animation, timing, etc. However, some previz projects can be technically challenging as companies are using more of camera capture, real time rendering, motion capture, etc.

- ***Story for programmers, designers, and artists in animation, VFX, and games***  
Craig Caldwell, University of Utah

When studios say, 'it's about the story!' everyone nods in agreement, however creating a story often remains a mystery for many in computer animation, VFX, and games because screenwriting hasn't been their focus. This session covers the universal elements of story that include plot, characters, and the distinct narrative structure. This course will emphasize story elements in context and their relationship to classic story structure. It analyses conflict, turning points, cause & effect, archetype v. stereotypes, inciting incident, and how choice defines character. In all stories there must be questions raised: What is at stake? What is going to motivate the main character? Will that be enough to move from them from the ordinary to go out into a different world? and what changes are necessary for the story to be dramatic? These are just a few of the storytelling elements necessary for a dramatic story.

- ***Introduction to professional standards in modelling***  
Andrew Paquette, NHTV

It is one thing to make a model that looks right and another to make a model that can be used. Different uses place different demands on models, but some criteria are universal. As an introductory course, students will work with fitness-for-use criteria that apply to almost any demand put on a 3D model in most industries. Secondly, the course will introduce students very quickly to basic modeling tools in Maya.

- ***GPU Computing for Graphics***  
Karl Hillesland, AMD

Modern GPUs support more flexible programming models through systems such as DirectCompute, OpenCL, and CUDA. Although much has been made of GPGPU programming, this course focuses on the application of compute on GPUs for graphics in particular. This course will start with a brief overview of the underlying GPU architectures for computing. The different languages of computing that take advantage of these architectures are discussed, and since this the focus is on application to graphics, the interoperability with graphics APIs and performance implications will also be included. The different issues related to choosing between compute and other programmable graphics stages such as pixel or fragment shaders, as well as how to interact with these other graphics pipeline stages are covered. The attendee will leave the course with a basic understanding of where they can make use of compute to accelerate or extend graphics applications.