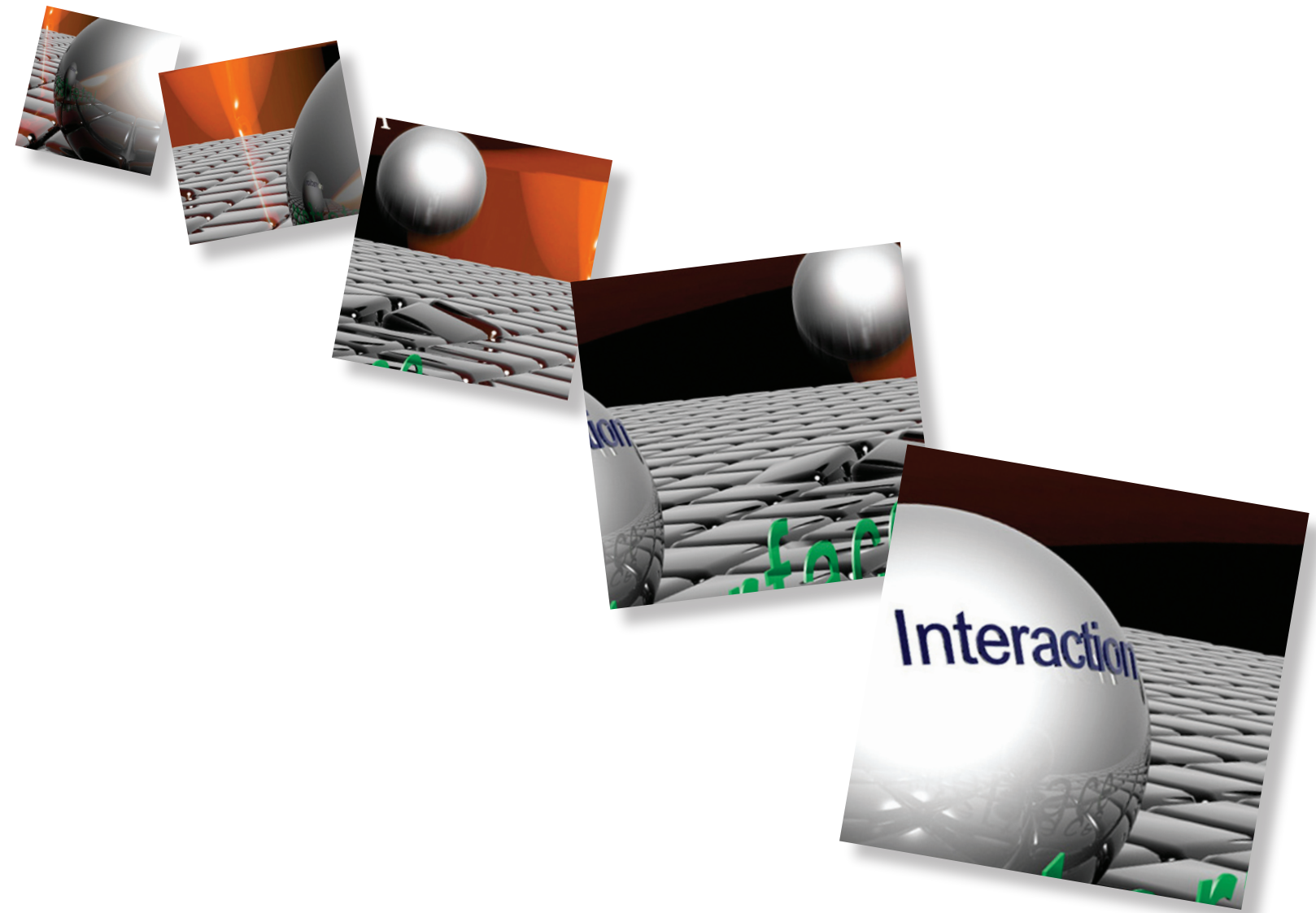


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Education Committee

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20	SPACE-TIME Traveling Show

Credits

Cover Image

Sam Dailey, University of Northern Colorado,
Honorable Mention, Student Print Competition

Catalog design and editing

Nancy Ciolek (designLink), Rochester Institute of Technology
Rick Barry, ACM SIGGRAPH Director for Education
Colleen Case, Schoolcraft College, Former ACM SIGGRAPH Director for Education
Catherine Begle, Schoolcraft College

Content

Tony Alley, Oklahoma Christian University
Frank Hanisch, University of Tuebingen
Dave Kasik, Boeing
Michael Mehall, Schoolcraft College
Jacob Pollak, Detroit Creative Group
Stephen Wroble, Schoolcraft College

director's statement

We all owe a debt of gratitude to Colleen Case for the selfless commitment she has made to ACM SIGGRAPH, to the conference, and to the greater education community as Director for Education over the past three years. I wish to express my personal thanks to Colleen for being professional and gracious in assisting me during the transition.

It's my intention that the next three years will be a period of both continuity and evolution for the Education Committee. It should be clear from Colleen's message that the ACM SIGGRAPH Education Committee has done, and continues to do, a great deal in support of education over the years. We'll want to continue to support and enhance those programs and activities offering the greatest benefit and value to our members, and to our potential members. And we'll want to identify what we can do that we may not be doing.

Education Program Review

Since education in the areas of artistic and scientific convergence is an ever-evolving matter, the Education Committee program will be reviewed regularly. To maximize the relevance of such a review, the process will be informed by the greater art and science education community (yes, this means you). See below.

Education Community Outreach

The mission of the Education Committee will be proactively inclusive. The Committee will undertake an aggressive, proactive effort to identify those in the digital arts and science communities – members or not – and keep them well informed about the organization's Education Committee, the conference's Educators Program, and the array of programs, activities and services they offer. In doing so, we'll be mindful of the potential pool of new participants, as well as the potential for new, enthusiastic members. This outreach will include a survey designed to inform us of your needs, and your views. There will be a particular outreach to, and support for, the digital arts educational community, to complement that already established for the computer sciences.

Increased External Communication

It's one thing to note perceived issues with community outreach and involvement, but it's another thing to do something about it. A new or existing Education Committee member will undertake responsibility for this area. The Committee will establish clear, comprehensive information about itself and its programs on the ACM SIGGRAPH web site, as well as accompanying handouts (based on the current annual report document). We'll build a database of relevant educational programs worldwide, and maintain up-to-date contact information to the best of our ability. We'll ensure that we communicate regularly with these contacts, provide them with links and physical handouts, and encourage them to participate in our programs. We'll develop greater incentives for such participation than those currently offered.

To assist in these efforts, I've made two new appointments: Amanda Fisk (Pratt Institute) joins us as the new Education Committee Admin. and Wobbe Koning (ideePIX) is our new Sysadm, who will help us to update and improve the Education website. I hope you'll join us to support this effort, and perhaps participate yourself? My email door is always open for constructive engagement.

Rick Barry
Director for Education
ACM SIGGRAPH
rick_barry@siggraph.org

former director's statement

Please join me in welcoming our new ACM SIGGRAPH Director for Education:
Rick Barry (Pratt Institute, Brooklyn, NY).

I wish to sincerely thank all the dedicated groups of volunteers who have made my term as Director such a great experience.

The SIGGRAPH Education Committee sponsors many different projects and activities that involve volunteers from around the world. 2006 marks the 22nd year for the committee. This catalog documents committee projects divided into three general focus areas: Curriculum Knowledge Base led by Tony Alley (Oklahoma Christian University), Community Building led by Professor Joaquim Jorge (INESC-ID Lisboa, Portugal) and Conference Activities led by Michael Mehall (Schoolcraft College). These focus areas facilitate our work groups based on the goals and objectives of the Education Committee.

Goals

- To encourage and facilitate efforts that connect communities; collaborative connections that better our educational process and trigger innovation and creativity.
- To support projects and experiences that further the development of the field; to evaluate existing projects and new projects to ensure they meet the needs of the educator and learner.
- To provide global online resources; to achieve and develop resources for educators; to encourage the definition of a knowledge base for the computer graphics discipline and to identify curriculum and core competencies, innovative processes and learning pedagogy.
- To look at all the learners in the field; to discover how best to design instruction and instructional interfaces using cognitive science and human learning theory, and to light the path for future educators so they can continue in the development of the field.

We focused on two very specific goals this past year. One was to better integrate our work into the Educators Program at the conference, and the other was to identify collaborative relationships with other organizations.

Sharing our year-round activities at the Conference

We have made a conscious effort to integrate the ongoing work from the Education Committee into several events during the Education Program at the SIGGRAPH 2006 Conference. 2006 Educators Program Chair, Marc Barr (Middle Tennessee State University). We highlight those events here and encourage you to participate in the entire Educators Program.

From our Curriculum Knowledge BaseWorking Group

A Knowledge Base for the Emerging Discipline of Computer Graphics

Forum | Thursday | 3 August | 2:30 - 3:30 pm | Room 157

Forums are great opportunities for feedback on our work. As we come to completion on the multi-year task of defining a knowledge base/curriculum specific to the emerging discipline of computer graphics, we look forward to the opportunity to share this work with a broader audience of educators, students, and industry professionals for feedback and open dialog.

Tony Alley (Oklahoma Christian University), Cary Laxer (Rose-Hulman Institute of Technology),Tereza Flaxman, Joe Geigel (Rochester Institute of Technology), Susan Gold (Sierra Nevada College), Lewis Hitchner (California Polytechnic State University), Genevieve Orr (Willamette University), Bary Pollack (Sierra Nevada College)

From our Community Building Working Group

Making of an Interactive Teaching Gem

Paper | Thursday | 3 August | 2 - 2:30 pm | Room 157

As we continue to explore community building efforts and repositories, we encourage you to attend this paper session that describing the full pipeline for creating an interactive teaching gem in computer graphics and related domains.

Frank Hanisch (WSI/GRIS Universität Tübingen), Wolfgang Strasser (WSI/GRIS Universität Tübingen)

From our Conference Activities Group

Ramp Out SPACE-TIME Student Poster and Animation Competition and Interactive Competition Recognition

Thursday | 3 August | 4:15 – 5:00 pm

Winners documented in this catalog are on display at our booth and will go on tour throughout the year. The winners’ works will be presented during this event. Join us to celebrate and plan for 2007.

Rick Barry (ACM SIGGRAPH Director for Education), Michael Mehall (Schoolcraft College), Jake Pollak (The Detroit Creative Group), Stephen Wroble (Schoolcraft College), Janese Swanson (ACM SIGGRAPH 2007 Educators Program Chair)

From other members of the committee

Designing Visual Information for a Global Audience

QuickTake Panel | Thursday | 3 August | 8:00 - 9:00 am | Room 157

This quick-take panel will look at teaching cross-cultural communication in interactive design at the Rochester Institute of Technology.

Chris Jackson (Rochester Institute of Technology), Nancy Ciolek (Rochester Institute of Technology)

Seeing the Unseen: Visualization and Education

Panel | Thursday | 3 August | 10:30 - 11:30 am | Room 157

As guest speakers at the 2005 open Education Committee meeting, Tom West and James Martinez graciously shared some of their work, and we look forward to this panel further sharing with the broader education community.

Thomas G. West (Krasnow Institute), James Martinez (Wye River Upper School), J. Jerry Uhl (University of Illinois)

Virtual Reality-Based Spatial Skills Assessment and Its Role in Computer Graphics Education

Paper | Thursday | 3 August | 10:30 - 11:00 am | Room 156

Nathan W. Hartman (Purdue University), Gary R. Bertoline (Purdue University)

Touch, Toys, and Interactive Materials: Combining Art and Technology to Spark Creative Thinking

Panel | Wednesday | 2 August | 4:00 - 5:00 pm | Room 157

We welcome Janese Swanson, SIGGRAPH 2007 Educators Program Chair, to the Education Committee, and encourage you to attend the panel from the MIT Media Lab investigating interactive toys and multi-modal interfaces.

Janese Swanson (SIGGRAPH 2007 Educators Program Chair, The Art Apprentice), Mitch Resnick, Hayes Raffle (Massachusetts Institute of Technology Media Lab)

Education Committee Booth

The Education booth organized by Guanping Zheng (Middle Tennessee State University) is our key contact point at the conference, and our activities are documented online and in this catalog designed by Nancy Ciolek (RIT School of Design).

Stop by and ...

Enter your school’s information into our Academic Information Index (Education Directory) led by William Joel (Western Connecticut State University).

Visit the display of the SPACE (Student Poster and Animation Competition Exhibition) and TIME (Today’s Interactive Media Exhibition) student competition winning works. The competitions are coordinated by Michael Mehall, Stephen Wroble (Schoolcraft College) and Jake Pollak (Detroit Creative Group).

Sign-up as a stop on the traveling tour throughout the year (Marla Schweppe Rochester Institute of Technology).

Share with us your ideas.

Meet our new Director, Rick Barry.

Collaborative Activities

CGE 2006

ACM SIGGRAPH and Eurographics are holding a computer graphics education workshop in conjunction with the Eurographics 2006 conference in Vienna and its conference education program. Attendance is based on position papers that address the workshop theme “Defining an International Curriculum in Computer Graphics”, reflecting the European interest in responding to the Bologna requirements for education in the EU. “Our aim is to define an international curriculum in Computer Graphics which respects the Bologna requirements (EU) and reflects the international nature of the computer graphics education.” (Workshop co-chairs: Jean-Jacques Bourdin, University of Paris France, Steve Cunningham, Grinnell College, USA, Marta Fairén, Polytechnic University of Catalunya, Spain).

Our activities are based on the work of volunteers. In addition to our new director, Rick Barry, we also welcomed this year: Janese Swanson (SIGGRAPH 2007 Educators Program Chair, The Art Apprentice), Glenn Goldman (Professor and Director of Imaging Laboratory School of Architecture New Jersey Institute of Technology), Frederico Eduardo Couceiro de Figueiredo (Intelligent MultiModal Interfaces Group - INESC-ID IST/Technical University of Lisbon), Scott Dunham (eVox) and LiQin Tan (Fine Arts Department, Rutgers University).

As we transition into a new year, we have an opportunity to re-assess our goals and objectives, identify and support new projects and revitalize and modify existing programs.

We encourage you to initiate new projects and donate your time, energy and ideas.

Thank you,

Colleen Case

ACM SIGGRAPH
Past Director for Education

spend a week at SIGGRAPH high school program

Dave Kasik
david.j.kasik@boeing.com

Spend a Week at SIGGRAPH is a program for high school students aged 16 or over.

The goal of the program is to give a group of local area high school students a full week’s exposure to the best of computer graphics and interactive techniques. The Pioneers will provide a mentors who will work with the student before, during, and after the conference.

What a Student Receives

Each Spend a Week at SIGGRAPH student will receive full conference registration and a \$300 stipend. Each student needs to be in the local area. There is no need for the student to be directly involved in technology or to know exactly what he or she wants to do. Teachers will help in the selection process, so each student needs to have at least a C GPA. It’s fine for a teacher or parent to accompany the student to the conference.

How a Student Is Selected

A parent, teacher, or student must contact the local student recruiter for each conference. The student recruiter will build the list for the Pioneers to support. Our current limit for bringing subsidized students to the conference is 20.

Expectations for Selected Students

You need to commit to:

- Attend a full sampling of SIGGRAPH events.
- Use your mentor to learn more about the conference and the history and direction of computer graphics.
- Write a one to two page summary of your experience and how it’s impacted you. You’ll send your summary to the Pioneer Mentor Coordinator. The summary must be received for us to send your stipend.

Expectations for Mentors

You need to:

- Physically be at the conference.
- Share your e-mail address with your student(s) before and after the conference.
- Meet with the student on a mutually arranged schedule during the conference.

This is the fourth year for the program. Take a look at <http://pioneers.siggraph.org/students.html> for more details and the letters we’ve collected since 2003.

cgems: computer graphics educational materials

CGEMS Working Group Leaders:

Frank Hanisch
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Joaquim Jorge
jaj@immi.inesc-id.pt

Built by and for the computer graphics (CG) educational community, the CGEMS – Computer Graphics Educational Materials Source is meant to spread educational excellence in CG-related fields. The journal-like online repository provides a means for educators’ work to be appraised and disseminated to other members of the worldwide CG community. Its technical platform was presented at SIGGRAPH 2004. In the following, we present experiences made with the first CGEMS submissions and results of a community survey taken at SIGGRAPH 2005. The working group currently removes stated barriers for participation, creates author guidelines and submission examples, and investigates new ways for adding value and support to CG education.

Please attend the following SIGGRAPH 2006 paper presentation that demonstrates the creation of CGEMS submissions.

Making of an Interactive Graphics Gem
Thursday, 3 August, 2–2:30 PM, Room 157

The CGEMS supports the CG community in collecting and sharing educational values. This report examines the current state of the project and its developing and dissemination activities – but most importantly it describes how and why educators should submit materials.

What is CGEMS

The CGEMS is an emerging online refereed repository for curricular materials related to Computer Graphics, Digital Arts and Media. It addresses the needs of teachers and practitioners in a mature, yet still evolving and reinventing field, namely to keep abreast of progress with quality, state-of-the-art curricular resources in a timely manner.

The SIGGRAPH Educational Committee and the Eurographics Education Board have sanctioned the CGEMS project in order to support teachers in their main activities. The platform supports submitting, reviewing and archiving curricular resources, by the community, from the community, to the community.



Community Building

The project represents the latest approach in building the worldwide CG educational community. The working group uses it as springboard to further investigate ways to define and encourage interaction in the community across the diverse disciplines. Activities range from creating collaboration technology to developing methods that actually spur collaboration and foster creativity to creating opportunities of making rich connections that further the field.

Educators in the graphics field first assembled in the 80’s in a series of SIGGRAPH workshops and activities related to CG education. During the Eurographics/SIGGRAPH Workshop on

Graphics and Visualization in Education (GVE’99) held in Coimbra, participants expressed the need for exchanging and archiving their educational work [GVE’99]. Three years later, attendees at the CGE’02 workshop in Bristol began working out the CGEMS concept, which finally led to a journal-like online system.

The system was refined during subsequent SIGGRAPH working group meetings and the CGE’04 workshop in Hangzhou and came on stream after SIGGRAPH 2004. Since then, many community members have expressed their anticipation for such a material repository and wanted to volunteer as a CGEMS contributor or reviewer. But for now, only a few materials were submitted. Undeniably, something else is missing to bring more people together besides the pure peer-reviewing mechanism. To understand exactly the reasons for this and assure that we are providing the supporting tools that the community needs, we executed a survey after SIGGRAPH 2005.

The Survey

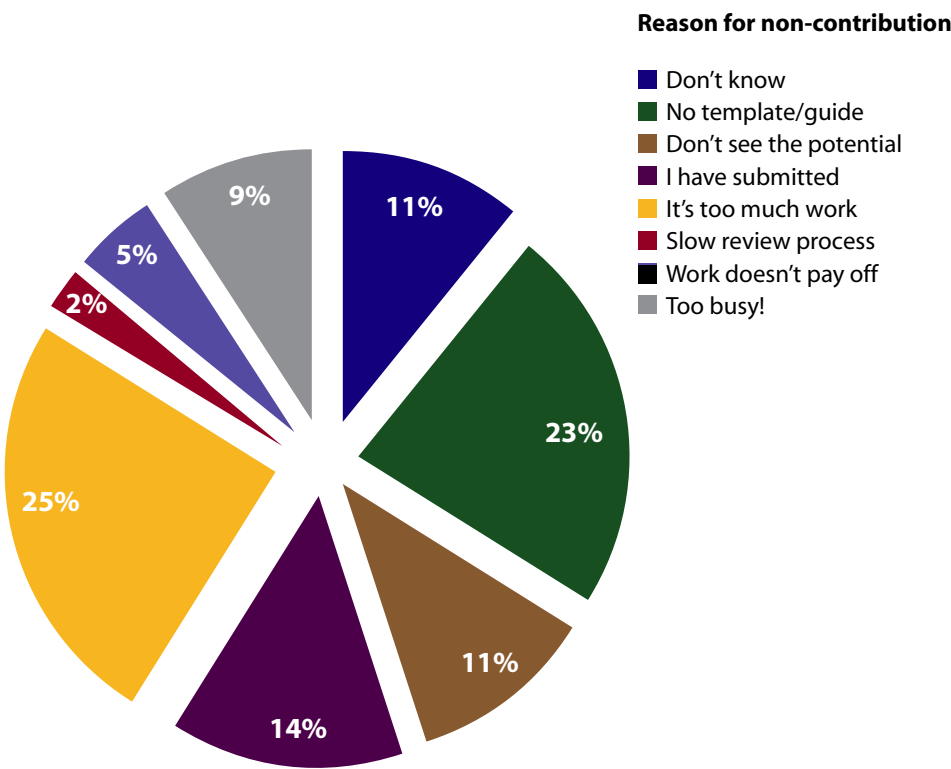
The user survey took place after having gathered operational experiences with the first CGEMS submissions. 44 educators from all educational levels and CG fields participated; most of them learned about CGEMS through SIGGRAPH and Eurographics.

48% were mailing list subscribers, 36% were registered or reviewer volunteers, 30% were interested in the published materials, and 20% were interested, but they did not feel a part of CGEMS.

CGEMS materials include a statement on the educational goals and educational settings, as well as the experiences. Before the survey, authors were given complete freedom in the preparation of their discourse. This, however, seems to be one of the key barriers preventing authors from submitting materials (48%). The statements are perceived as too much work (25%) besides the development of the actual material. So, after the survey we agreed that creating material and filling submission forms should be enough. We developed Web forms with fields for a brief introduction, educational goals, the methodology applied to meet these goals, assessment methods used, and screenshots. The previously required scholarly paper is dropped and derived from the Web form input.

The remaining respondents requested author guidelines, templates, and submission examples (23%). They have already been set up by the editors in chief and are currently reviewed. Author guidelines list all acceptability and publishing criteria that were extracted from experiences with the first CGEMS submissions. They also include soft- and hardware recommendations to lower the reviewers' work load. The submission example provides a quality sample for interactive materials; its making is demonstrated in this year's SIGGRAPH Education program.

Feedback shows that community members definitely want to comment (89%) and rate (91%) CGEMS materials. We plan to let registered users, not necessarily authors or reviewers, comment on material with a short note and a five-star rating. Anonymous comments should be possible, however all notes should be moderated by the editors in chief before they become published.



Barriers for submitting educational materials to the CGEMS (N=44)

Apart from collecting materials, the community must be given added value and support, otherwise they will not participate. The key value CGEMS offers to authors is peer recognition. We plan to strengthen this value by adding CGEMS profiles for registered users. User profiles will include the member's photograph, affiliation, biographical notes, contact, and homepage. Published CGEMS material will become automatically listed on the author's profile, as well as personal CGEMS favourites. Note that this approach might create a "Who's Who in CG Education," a consequence that the CGEMS editorial board must recognize and establish carefully.

Why submit?

We encourage members of the CG community to publish course innovations in the CGEMS. The refereed repository is backed by the foremost professional associations in Computer Graphics – peer recognition is ensured.

By publishing in CGEMS educators can make their work accessible to a community, which includes thousands worldwide. The CGEMS academic fair use assures that materials are available

for classroom use with due credit being assigned. CGEMS materials can be submitted online at <http://www.cgems.inesc.pt>

Contributors will have to document their submission by stepping through the Web forms mentioned above – any further work besides the actual material creation is not required.

The current **CGEMS Call for Material** is about "Spreading the Computer Graphics Curriculum." If you have developed valuable content in the field – publish it and shape your academic identity! We consider material in the following categories:

- Complete Module: a self-contained, single-topic teaching unit.
- Problem Set: Student assignment with underlying rationale and structure.
- Teaching Gem: an innovative bit of teaching material that highlights an approach to teaching a particular problem.

Outstanding contributions will be exhibited at SIGGRAPH 2007.

curriculum knowledge base

Curriculum Knowledge Working Group Leader:

Tony Alley
Oklahoma Christian University
alley@siggraph.org

Computer Graphics Curriculum Knowledge Base Group members are Tony Alley, Gary Bertoline, Gitta Domik, Lew Hitchner, and Cary Laxer. Group activities include workshops and projects that focus on the definition of a knowledge base for the computer graphics discipline. The aim is to provide a curricular structure and supporting materials that will aid instructors and institutions working to develop or enhance academic programs in computer graphics. This year, work continued on development of a curricular framework principally for use in higher education. This effort builds on previous forums and workshops led by Gary Bertoline, Cary Laxer, and Tony Alley. The Curriculum Knowledge Base Group invites SIGGRAPH members to propose new projects that will benefit CG educators.

In 2001, the SIGGRAPH Conference Educators Program included an open forum hosted by Gary Bertoline to discuss the idea that computer graphics can be understood as an emerging discipline. The following year, a second forum was offered to address key concepts in a curriculum to support the emerging discipline. Thereafter, a small working group was established to consider the ideas presented during those forums; with consultation from industry and, this year, representatives of the international community of CG educators. Key to the efforts of this small working group is this idea that computer graphics is at a crossroads, similar to that of computer science in the late 1950s and early 1960s. New tools and applications have already spawned many new courses and new programs and possibly even departments are anticipated.

Three requirements need to be met for a body of knowledge and associated practices to be designated a discipline [Kristiansen 2000, Rumble 1998, Sheth & Parvatiyar 2002]. First, theoretical and conceptual specialization must be demonstrated, often through a well-established and fairly unique research agenda. Next, it must be shown that the discipline can be characterized by a unique cultural identity. Finally, a discipline must demonstrate relative autonomy, in that a distinctive knowledge base can be articulated.

That thousands attend the SIGGRAPH Conference each year to discuss common research interests suggests that computer graphics exists as a unique discipline. That such a "special interest" group even exists, also points to our autonomy. So, too, do the various CG journals, courses, applications, and societies. The missing requirement for discipline status has been the articulation of a distinctive knowledge base. That has been the task of the aforementioned small working group.

This year, details of this knowledge base will be presented in an open forum (Thursday, August 3, at 2:30 p.m.). The knowledge base is intended to serve as the scaffolding for curricular programs in CG, whether offered by art schools, liberal arts colleges, undergraduate or graduate, two-year or four-year, etc.

As it attempts to frame the broader discipline of computer graphics, as opposed to specific applications or industries, it should also prove especially helpful in the design of introductory or survey courses. Regardless of your role in education or the CG industry, we value your input and encourage you to attend this open forum. Just as "Curriculum 68," a report by the ACM Committee of Computer Science, helped establish early academic programs for, what was at the time, the emerging discipline of computer science [Charmonman 2000], our efforts here may prove helpful to the development of new and unique offerings for the CG community. We invite you to participate in the open forum and be a part of this exciting process.

What follows is the knowledge base as defined during the working group's November 2005 meeting. Of interest, the two tracks defined during the earlier meetings were merged into a single knowledge base. The group's rationale was that its work ought to reflect a united knowledge base defining the discipline of computer graphics, and not tracks specific to isolated applications. That is, it is suggested that every computer graphics student will invest some amount of time, whether small or large, with every listed concept. For example, students with decidedly aesthetic interests may spend a great deal of time studying color theory, while students with a more technological orientation may spend far less. However, every computer graphics student needs to have some understanding of color theory.

There are sixteen broad headings, many with sub-headings and additional detail. Content isn't meant to be exhaustive but, instead, provide general guidance and examples of curricular experiences and concepts.

Those most directly involved with developing this framework include Tony Alley, Cary Laxer, Tereza Flaxman, Joe Geigel, Susan Gold, Lewis Hitchner, Genevieve Orr, and Bary W. Pollack.

Fundamentals – an overview of the field; foundational concepts; industry highlights; careers; roles and responsibilities; milestones in the chronology of CG; CG as a contributor to other fields and disciplines; CG as a discipline in its own right. Overview of:

- Vocabulary – meaningful terms and concepts; broadly-based theoretical frames and issues that are essential to an understanding of the field
- Hardware – computers; monitors and displays; networks; digital media; platform technologies; architectures
- Software Systems – programs/applications, operating systems; structures; formats for data sstorage
- Representations of Visual Systems – pixels and polygons; 2D and 3D display, color

Professional Issues

- Ethical Issues – ACM code of ethics; IEEE code of ethics; US Information Industry’s Code of Good Practice
- Teamwork – project management; responsibilities of team members; synergy; support; assessment
- Communication – communicating thoughts and ideas
- Time Management – planning projects and workflow; the CG production cycle: stages, tasks, and products
- Cultural – ubiquitous content and social-interaction models
- Intellectual property – defining property rights; licensing
- Copyright – US and international copyright law; fair use; CONFU (Conference on Fair Use, Sept. 1994)
- ADA – availability and access to information
- Color blindness – design issues and special needs

Physical Sciences

- Collision detection
- Movement in the real world
- Newton’s laws of motion; weight, mass, and inertia
- Light (color, refraction, reflection, dispersion, fluorescence)

Math – an introduction to mathematical concepts sufficient to ensure that the student can manipulate objects in coordinate space, to include rotations, scaling, movement; an understanding of linear dimensions and angles.

- Geometry – plane and solid geometry; points, lines, planes, and space; angles
- Transformations – rotation, movement, and scaling of objects
- Coordinate systems
 - local coordinate systems vs. world coordinate systems
 - Cartesian coordinate system (x, y, z)
 - 2 and 3D Coordinate Systems
- Matrix and Vector Algebra
- Complex Numbers/Quaternions
- Parametric/Non-Parametric Representations
- Numerical Methods

Perception and Cognition - Students must realize how the viewer’s state of mind and mental processes influence their interpretation of CG projects. The eyes and mind interpret the world rather than realizing or comprehending it. Because of this, digital artists must cater their techniques to both accommodate and engage viewers.

- Visual – how the human eye translates light into mental images
- Spatial – human interpretation of space and dimension
- Motion – how the eyes and mind understand motion
- Presence and Immersion – participation and firsthand experience
- Navigation – organization and presentation of information; linear and non-linear graphic experiences
- Psychology – planning for engagement; how humans process visual information; the psychology of graphics and graphic design, color
- Human Computer Interaction (HCI) – motivation; accommodating human diversity; design principles and trade-offs; usability testing; prototyping techniques and tools; virtual reality interfaces; user interface management systems; tools for user interface construction and graphical programming environments

Programming and Scripting – what is programming; what is scripting; how is code organized; what are procedures, loops, calls, if-then statements, etc.; how to approach programming/scripting tasks; algorithms.

- Theory – basic programming techniques, including variables, arrays, loops, functions, classes, objects, etc.; object-oriented programming; database theory
- Language – almost every computer graphics student will come in contact with programming or scripting at some point; students should be introduced to HTML, JavaScript, ActionScript, and Lingo and possibly even C++, Java, macro-programming languages (for Word, Excel, etc.) ASP, XML, XHTML/DHTML, ColdFusion, CSS, and SQL
- ActionScripting – coding for interactivity and animation; writing button handlers, generating scripted motion, creating pre-loaders, creating various scripted effects, and accessing information in external files
- Graphics API – GLIDE API; OpenGL; Cg; ATU HSLS (DirectX 9); theoretical foundations and algorithmic issues; mechanics of using APIs; a theoretical introduction illuminated by use of the API
- Algorithms for graphics primitives (lines, polygons, fill algorithms, line antialiasing techniques)
- Geometric Transformations (2D and 3D)
- Viewing and Clipping Algorithms
- Hidden Surface Removal Algorithms
- Lighting Models/Texture Mapping
- Color Models
- Object/Scene Modeling

Animation

- Principles of animation
- Time and motion – interpolation, tweens, morphing
- Motion control
- Rigid body dynamics vs. procedural animation
- Inverse kinematics vs. forward kinematics
- Rigging
- Visual effects (e.g. particle systems, waves, smoke, fire)

Image Synthesis / Rendering – Algorithms for generation of primitives, material properties/interaction with light, reflection and shading models, texture mapping, sampling and anti-aliasing techniques, ray tracing, hidden surface removal techniques
Shaders – procedural shaders; material, Rendering – cameras; resolution; file types; safe areas

Real-time Graphics

- Optimization
- Level of detail modeling
- Gaming
- Virtual Reality

Modeling – curves; non-uniform rational B-splines (NURBS); polygonal modeling; level of detail; motion capture and object tracking; subdivision surfaces and meshes, scene description formats.

- 3D modeling – polygonal modeling; deformations; parametric primitives; NURBS; lathed, lofted, extruded, and skinned objects; modeling economy
- Geometry – geometry created with primitives, splines, meshes, and NURBS systems; economic modeling; normals
- Character design – designing for animation; form as it communicates character attributes

Graphics Hardware – properties of output devices (CRT’s, flat panel technologies); input devices; special purpose chip sets/graphics cards; pipeline architecture; programmable architectures; comparison of graphics card features

Image Processing & Manipulation – fundamentals of cameras/sensors; image geometry, and sampling/quantization issues; image transformations (Fourier transforms) and image enhancement techniques; image filters; image encoding techniques; dealing with noise

- computer vision: image acquisition issues, algorithms for image segmentation (e.g., edge detection), image understanding of 2D and 3D scenes
- image interpretation
- Graphics/Image file formats
 - Image compression
 - Geometric (vector) vs. raster representations; color reduction techniques; compression methods; role of ISO/ANSI standards committees; overview of major file formats (JPEG, CGM, TIFF, PNG, GIF, vendor/application specific formats (e.g, Adobe, Mac formats, MS Windows formats)

Writing – storytelling; narrative support of CG experiences

- Script writing – concept development; format for scripts
- Storyboarding – conveying action through stills, roughs, animatics, and storyboards
- Creative writing – storytelling; writing for digital visual media; narrative positions; genres; point of view; writing dialog; establishing plot, conflict, action, and resolution (timing); script format
- Character development – design as it communicates character attributes; acting for animators

Cultural Trends & Historical Perspectives – tastes; timelines; genres, schools of thought, and movements; the influence of art on politics, societies, cultures, economies, and vice versa

- Photography
- Computer Graphics and Animation

Design Studies – style; aestheticism; form and function; graphic communication.

- Theoretical – design as a purposeful activity; visual language; design principles and their foundations; color theory; psychology of color
- Aesthetics – visual appeal; film & game aesthetics; media as a social, cultural, political, and critical force
- Film/Video – staging; genres; editing
- Animation
- Game
- Applied
- Visual Design
 - Composition
 - Symmetry
 - Proportion
 - Positive/Negative Space
 - Layout
 - Color representation (Color spaces)
- Audio Design
- Drawing
- Tactile/physical to digital expression

Advanced Topics

- Data/Scientific Visualization
- Artificial Intelligence

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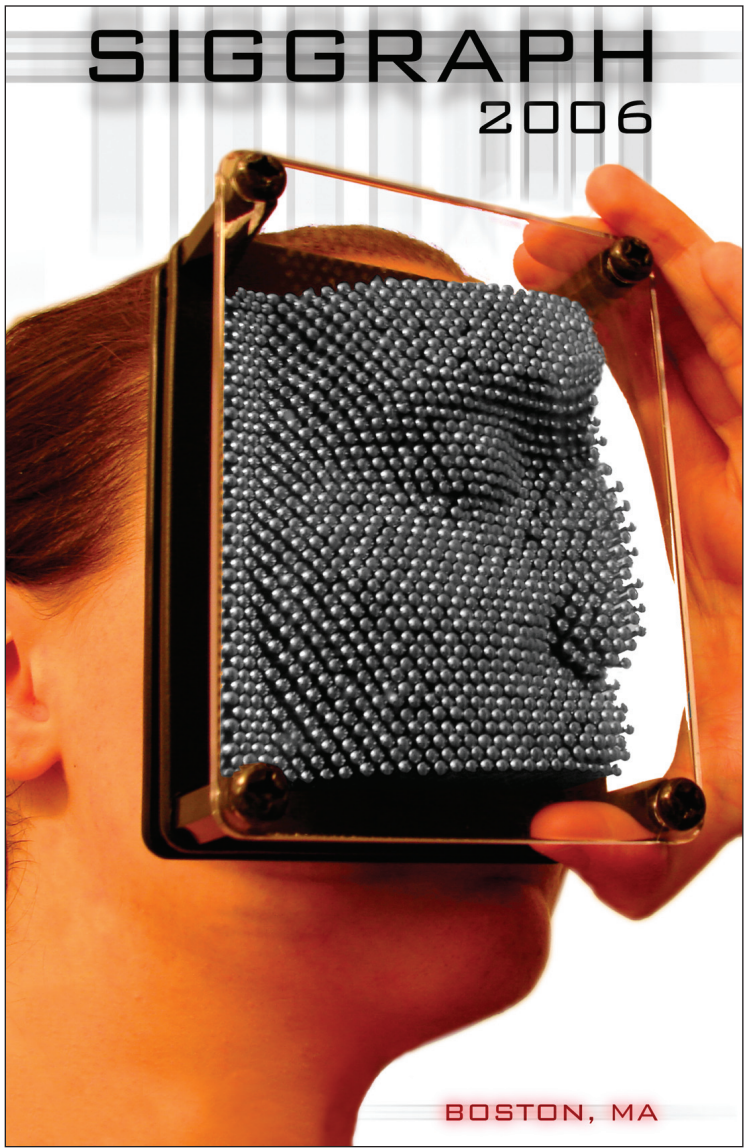
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SPACE-TIME student competition/print

The Poster/Print portion of the SIGGRAPH Student SPACE-TIME Competition for 2006 is a display of excellent design and technical proficiency. This year's SIGGRAPH Education Committee sponsored competition was based on a theme of "Interaction Interface". Submissions reflected a broad range of interpretations of this year's theme.

After premiering at the annual SIGGRAPH conference in Boston this summer, the show will be made available for viewing around the world. For more information please visit our Website:
<http://www.siggraph.org/education>

College/University Poster Competition

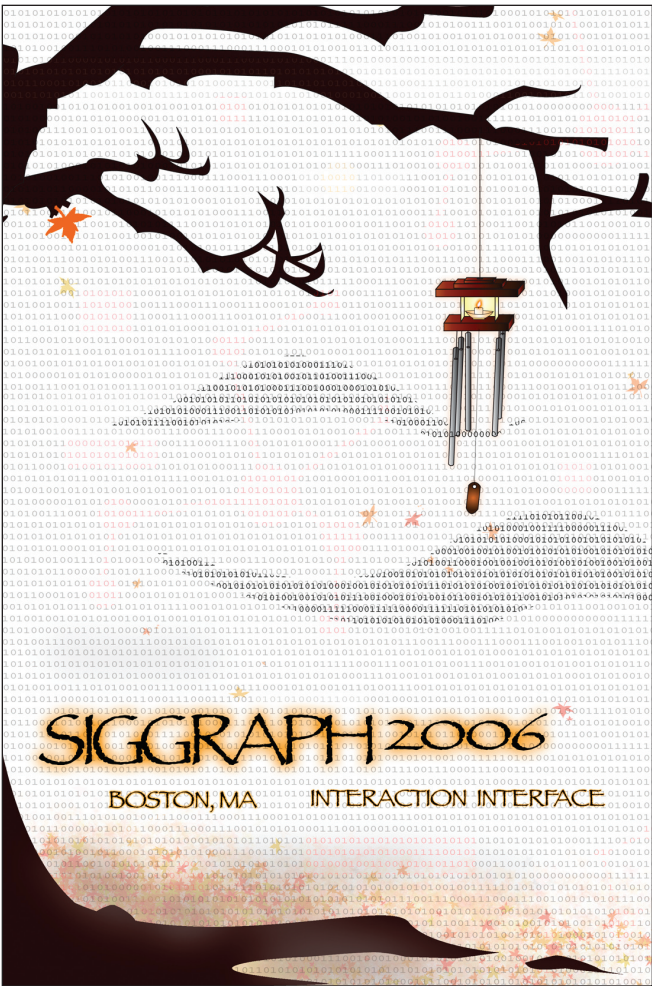


First Place
Student: Chase Cooper
Instructor: Cher Cornett
School: East Tennessee State University
Johnson City, TN

College/University Poster Competition



Second Place
Student: Mary-Yen Hoang Nguyen
Instructor: Scott Conard
School: University of Kentucky
Lexington, KY



First Place, High School Poster Competition
Student: Abby Cunanan
Instructor: Miyoung Min
School: Bergen County Academy
Hackensack, NJ

Honorable Mention

Charles Cochran
Instructor: Alisa Pitchenik
New World School of the Arts
Miami, FL

Sam Dailey
Instructor: Anna Ursyn
University of Northern Colorado
Greeley, CO

Leslee Garman
Instructor: Scott Conard
University of Kentucky
Lexington, KY

Will Jackson
Instructor: Greg Marlow
East Tennessee State University
Johnson City, TN

Mia Kelly
Instructor: Alisa Pitchenik
New World School of the Arts
Miami, FL

Julia Kim
Instructor: Mary Ann Biehl
The New York College of Technology
Brooklyn, NY

Zachary Klauck
Instructor: Anna Ursyn
University of Northern Colorado
Greeley, CO

Kristin Madson
Instructor: John O. Smith
U of W Stevens Point
Stevens Point, WI

Jennifer Nelson
Instructor: Alisa Pitchenik
New World School of the Arts
Miami, FL

Samantha Olson
Instructor: John O. Smith
U of W Stevens Point
Stevens Point, WI

Matthew Revis
Instructor: Jim Livingston
East Tennessee State University
Johnson City, TN

Balentin Rodriguez
Instructor: Alisa Pitchenik
New World School of the Arts
Miami, FL

Craig Simpson
Instructor: Cher Cornett
East Tennessee State University
Johnson City, TN

Tatiana Vahan
Instructor: Alisa Pitchenik
New World School of the Arts
Miami, FL

Denad Wade
Instructor: Michael Mehall
Schoolcraft College
Livonia, MI

Lindsey Wollan
Instructor: John O. Smith
U of W Stevens Point
Stevens Point, WI

Coordinator
Michael Mehall, Associate Professor
Schoolcraft College

Jurors
Catherine Begle
Schoolcraft College

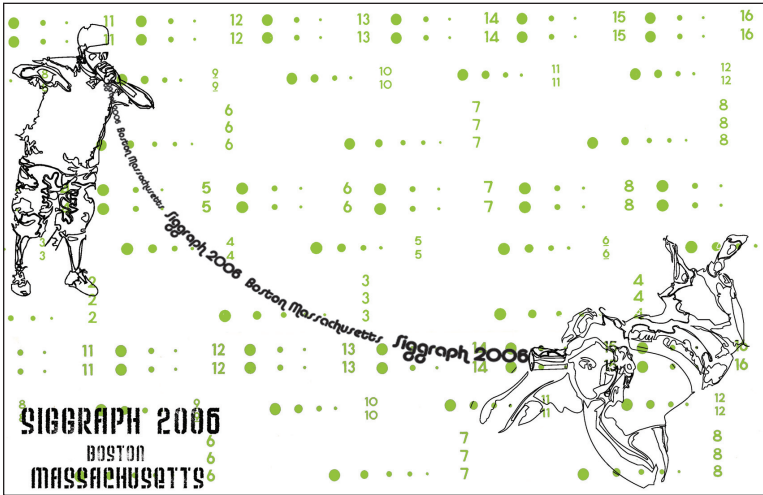
Scott Dunham
CGI Producer
eVox Productions LLC

Donna Gniewek
Schoolcraft College

Celia McCulloch
Macomb Community College

Karyl Niemi
Canton Creative Marketing LLC

Kay Estredo
Freelance Graphic Designer



SPACE-TIME student competition/animation

Over the last year, students from schools around the world in a number of countries around the globe have been working toward getting their submissions prepared for this competition. This year's SPACE Animation Competition includes a total of 42 entries, from 15 colleges and two high schools, from Japan and the United States. There is a wide range amongst the submissions. Some are simple, and some complex. Some tend toward photo realism, some are whimsical, and still others are experimental or abstract in nature. Some focus on technique, while some try to tap into the emotions of the audience.

The entries were judged "blind" meaning all identifying credits had been removed. The accepted submissions were compiled onto a DVD for viewing by the jurors. Each juror received a jury packet containing copies of the DVD, jury instructions, and various other relevant information.

The jurors then proceeded individually through their selection process by ranking each submission according to five categories: animation, creativity, quality, sound, and story. Scores were averaged to determine the winners.

The next step involved preparation of the accepted submissions, to include category winners and honorable mentions, for presentation during the Educators Program at the conference in Boston. For presentation purposes, the submissions are used in their pristine form, including logos and credits.

Of the 42 entries, the top 12 were selected as Honorable Mentions or Category Winners. The top ranking entry in each category is distinguished as the Category Winner. The four category winners this year are: "Without Sin" by William Caballero (Fine Art/ Experimental), "Bananas" by Zach Parrish (Storytelling / Narrative), "Who Goes First?" by Yi-Hsuan Huang (Character), and "Blight" by Seth Kendall (Visual Effects).

Coordinator
Jacob S. Pollak
Computer Graphics Technology Program
Schoolcraft College
President, The Detroit Creative Group

Jurors
Jeannie Eng Autodesk
Mark DeRidder Armstrong White
Ryan Price Freelance 3D Artist
Randy Rockafellow Rockafellow Media
Brooke Merva Speedshape
Bob Wilson Freelance Animator
Bob Andersen Division X
Gary Shifflet Kinetic
Scott Paul Dunham eVox Productions LLC
Akil Dawkins Stardock Corporation

Honorable Mention

Fine Art/ Experimental

Student: Christopher Myers
Title: Solomon Grundy
Instructor: Jeremy Moorshead
School: Savannah College of Art and Design Savannah, GA

Student: Jae Yoon Park
Title: Evocation
Instructor: Carl Edwards
School: School of Visual Arts New York, NY

Storytelling/Narrative

Student: Eiji Fumahashi
Title: Awake
Instructor: Ms. Junko Kuroda
School: Digital Hollywood University Tokyo, Japan

Student: Matthew Trudell
Title: Too Much to Bear
Instructor: Ed Dorino
School: Pratt Institute Brooklyn, NY

Character Animation

Student: Kelsey Wander
Title: Centsless
Instructor: Jeremy Moorshead
School: Savannah College of Art and Design Savannah, GA

Student: James Xu
Title: Steakhouse Showdown
Instructor: Jeremy Moorshead
School: Savannah College of Art and Design Savannah, GA

Visual Effects

Student: Shinsaku Hidaka
Title: Bones
Instructor: Tomoyuki Sugiyama
School: Digital Hollywood Tokyo, Japan

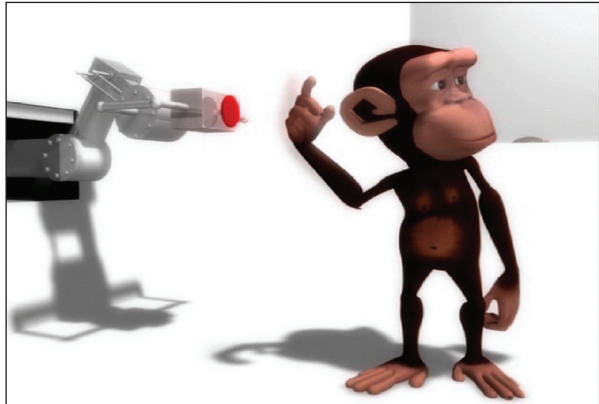
Student: Dave Hudson
Title: Dollmaker
Instructor: Jason Hopkins
School: The School of the Art Institute of Chicago Chicago, IL



Category Winners

Fine Art/ Experimental

Student: William Caballero
 Title: Without Sin
 Instructor: Melissa Barret Lundquist
 School: Pratt Institute
 Brooklyn, NY



Storytelling / Narrative

Student: Zach Parrish
 Title: Bananas
 Instructor: Rebecca Wible
 School: Savannah College of Art and Design
 Savannah, GA



Character

Student: Yi-Hsuan Huang
 Title: Who Goes First?
 Instructor: Jeremy Moorshead
 School: Savannah College of Art and Design
 Savannah, GA



Visual Effects

Student: Seth Kendall
 Title: Blight
 Instructor: Chris Redmann
 School: Drexel University
 Philadelphia, PA

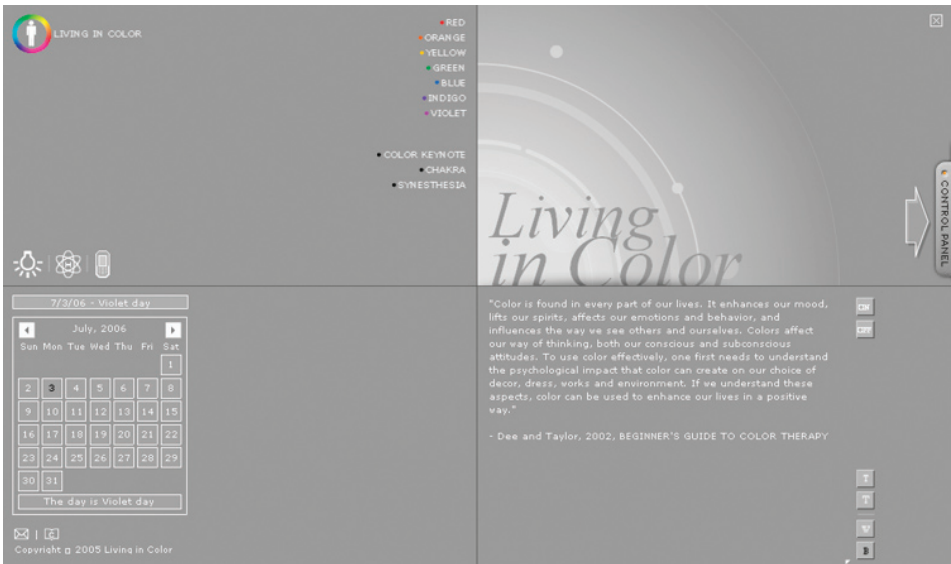
SPACE-TIME student competition/interactive

Each year, the ACM SIGGRAPH Education Committee sponsors the Student Interactive Media Competition. The competition is open to all students and serves as a showcase for advanced interactive computer graphics techniques. This year, students were asked to create a project designed to inform, or educate the user. The competition was not limited to formal academic subjects.

The competition is open to both online and stand alone projects. Online projects are those projects intended for distribution on LANs or on the internet. These projects would typically be viewed using a web browser with commercially available plug-ins. Stand alone projects are intended for distribution via CD, DVD, kiosk, or personal computer. These projects would typically consist of a self running executable file sometimes with linked data files.

Entries were judged on the basis of design, originality, interactive techniques, technical excellence, and artistic merit. The jury was looking for submissions that pushed the limits of the technology and that provided a rich experience for individuals to interact with the work.

The jury this year chose to honor three projects:



First Place

Title: Living in Color
 Student: Gye Won Gho
 School: Academy of Art University
 San Francisco, CA

Coordinator

Stephen Wroble, Professor
 Computer Graphics Technology Program
 Schoolcraft College, USA

Assistant Coordinator

Scott Paul Dunham, CGI Producer
 eVox Productions LLC, Troy, MI USA

Jurors

Petronio A. Bendito, Professor
 Department of Visual & Performing Arts
 Purdue University, USA

Jennifer Deafenbaugh, Multimedia &
 Motion Graphics Designer
 Itty Bitty Studio
 Columbus, OH, USA

Duncan Folley, Senior Lecturer
 School of Engineering
 Leeds Metropolitan University
 Leeds, UK

Frank Hanisch, Scientific Assistant
 WSI/GRIS
 University of Tuebingen
 Germany

Lourdes Livingston, Graduate Director
 School of Computer Arts
 New Media
 Academy of Art University, USA

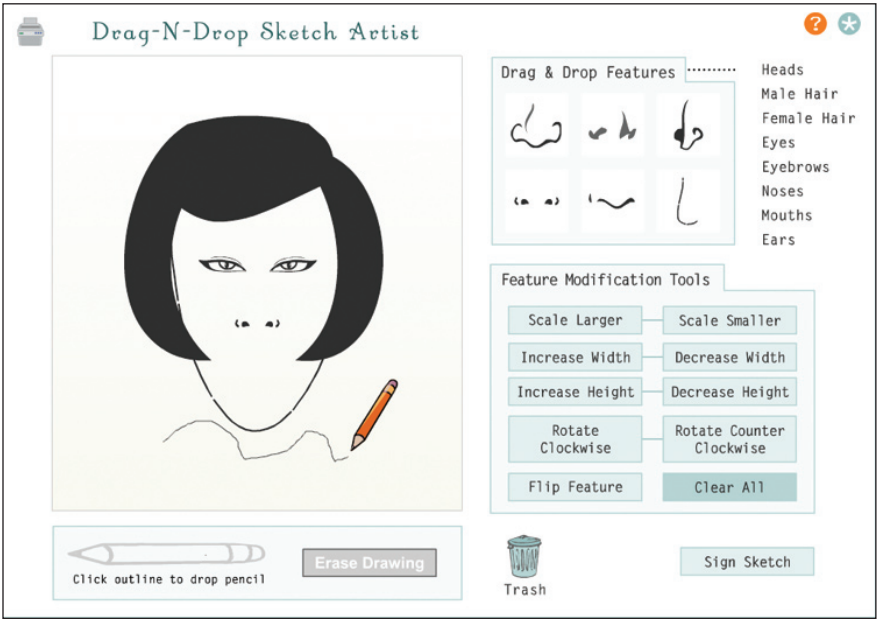
Simon Thomson, Senior Lecturer &
 Teaching Fellow
 School of Engineering
 Leeds Metropolitan University
 Leeds, UK

Jana Whittington, Assistant Professor,
 Computer Graphics Technology Coordinator
 Department of Computer Graphics
 Technology
 Purdue University Calumet, USA



Second Place

Title: Lohner
Student: Iain Harper, Adam Hayward, Matt Wilson, Karl Ward, Craig Bennett, Katherine Moss
School: Leeds Metropolitan University, Leeds, UK



Honorable Mention

Title: Drag-N-Drop Sketch Artist
Student: Jeff Ludwig
School: Schoolcraft College, Livonia, MI

call for submissions 2007

The ACM SIGGRAPH Education Committee (ASEC) is sponsoring the SPACE-TIME Student Competition. The juried competition in print, linear animation and interactivity provides an excellent opportunity for students working in computer based media to exhibit their creative work nationally and internationally. It is open to all students currently attending elementary or secondary schools, colleges or universities. We encourage professors and teachers to have their students enter this prestigious competition.

Selected projects will be on exhibit in San Diego, California at the SIGGRAPH 2007 conference. Winning entries will also tour nationally and internationally for approximately one year with the traveling show conducted by the ACM SIGGRAPH Education Committee. Selected projects or project segments from the entries may be included on the ACM SIGGRAPH Education Committee Website and in promotional materials distributed at the conference. The first place winner in each competition will receive one student conference passport to the SIGGRAPH Conference.

General Rules of the Competition

- All entries must have been created while the student was currently attending a school program (work completed last year is also acceptable).
- These are juried shows. Entries will be judged on the basis of content, design, originality, technical excellence, and artistic merit. Preference will be given to submissions that push the limits of the technology available or involve combinations of technologies.
- Each student may enter one project per presentation style.
- Submitted media will not be returned.
- Entries will not be considered without a completed entry form.
- Illegible and incomplete forms will not be considered or reviewed.
- Nothing on the entry form is optional. Be sure that you fill out the form completely.

Submissions

ALL ENTRIES MUST BE RECEIVED BY MAY 1st
Official form is located at:

<http://www.siggraph.org/education/conferences/S2007/cfp/SPACE-TIME.htm>

Division of Presentation Style:
Print

- Following the theme is required for print entries.
- All artwork must include the text "SIGGRAPH 2007 and "San Diego, CA" (California can also be spelled out).
- Image size is 11" x 17" at 200 ppi in a PSD, TIF, or PDF format.
- The original file must be accompanied with a JPEG file 388x600 at 72 ppi.
- Entry form must have a letter-size hard copy of the poster image attached to it. Please DO NOT send full size or mounted prints.
- You must have written authorization for any copyrighted imagery used in the work. (Attach copy of authorization to your entry)

Submit print entries to:

LiQin Tan
Department of Fine Arts
Rutgers University
314 Linden Street
Camden, NJ 08102
ltan@camden.rutgers.edu

Linear Animation

Animation entries may be narrative in nature, or character animations or visual effects animations or fine art animations and may be individual or group projects. They should not exceed five minutes in length.

- It is preferred the piece be submitted in completed form, though works in progress may be submitted so long as enough of the work is completed for evaluation and so long as a completed version will be ready for final submission by **June 15th**.
- You must have written authorization for any copyrighted sound or imagery used in the work.
- Submissions should be made as a Quicktime .mov digital file on CD or DVD Data mediums. Submitted media will not be returned.
- Two versions of the submission are required: One with name/school/ software credits, and one without credits for blind judging.
- A reference still image is required: 3" h x 4" w @ 300dpi (900px x 1200px) in .tif format

Submit animation entries to:

Jacob S. Pollak
Schoolcraft College
Computer Graphics Technology
18600 Haggerty Road
Livonia, MI 48152-2696
jake@detroitcreative.com

Interactivity

- The submission must be interactive. People must be able to experience the project directly, individually or in small groups.
- It is preferred the piece be submitted in completed form, though works in progress may be submitted so long as enough of the work is completed for evaluation and so long as a completed version will be ready for final submission by **June 15th**.
- Submission must provide final archived version on CD, DVD or other media (Zip, Jaz or diskette). Submitted media must be clearly labeled.
- Both individual and group projects are welcome.
- You must have written authorization for any copyrighted sound or imagery used in the work.
- You must include a listing of required plug-in components needed to view the site and/or preferred browser.
- Must include full credits.

Submit interactivity entries to:

Scott Dunham
1404 Yorkshire
Grosse Pointe Park, MI 48230
scott@dsemafx.com

SIGGRAPH 2007 Educators Program Call for Participation

SIGGRAPH 2007 will be held in San Diego, California, USA, 5 August – 9 August 2007 at the San Diego Convention Center. If you are interested in participating in the Educators Program, check the Website for information and deadlines.

<http://www.siggraph.org/s2007>

The SPACE-TIME Traveling Exhibit

The winning entries (posters, animation and interactive work) from the SIGGRAPH SPACE-TIME student competition are available to travel. Many chapters and schools exhibit this work each year after the conference. If you are interested in hosting the work at your venue, contact:

Marla_Schweppe@siggraph.org

SPACE-TIME2005 show hosts:

Rochester Institute of Technology, hosted by Marla Schweppe

Loyola Marymount University, hosted by Jose Garcia-Moreno

University of Northern Colorado, hosted by Anna Ursyn

International Academy of Design & Technology - Tampa, hosted by Amy Boyer and Victoria Snabon

Piedmont Community College, hosted by Paula Hindman

Wye River Upper School, hosted by James Martinez

Purdue University Calumet Student Chapter, hosted by Jana Whittington

Youngstown State University, hosted by Marla Mayerson

Collin County Community College, hosted by J. Marshall Pittman