ACM SIGGRAPH 2010 – the International Conference and Exhibition on Computer Graphics and Interactive Techniques – was held in Los Angeles in July of 2010 under the auspices of the Association for Computing Machinery (ACM). For 37 years, this conference has brought together an ever-growing community of up to 40,000 artists, designers, scholars, scientists, and engineers who work at the intersection of art, design, computer graphics, and interactive techniques. This year, SIGGRAPH consisted of several programs: Art Gallery, Computer Animation Festival, Courses, Emerging Technologies, Game, Papers, Posters, Talks, Awards, and SIGGRAPH Dailies. The rest of this event review summarizes and highlights some interesting and relevant aspects of the event. Further information can be found on the SIGGRAPH Website http://www.siggraph.org/s2010

The SIGGRAPH 2010 Art Gallery. This year Art Gallery has been titled “TouchPoint: Haptic Exchange Between Digits.” Richard Elaver, Chair of the juried Art Gallery, described this year’s exhibition as an investigation of the poly-sensory nature of human experience in a technologically enhanced environment. The exhibition explored the techno-human interface, engaging an array of tools to materialize and visualize artifacts of creative expression. Unique physical interfaces involved the “viewer” and/or the artist in haptic human interaction. Our sensory systems and aesthetic experiences operate simultaneously on several channels. Touch, for example, is a complex structure of multiple sensory mechanisms, synthesizing such information as pressure, temperature, hardness, vibration, and weight. This sensory amalgamation, which is exploratory in nature, comprises haptic awareness through the active combination of kinesthetic and tactual evidence. The jury extended the breadth of sense experience and the selected works included scent and audio interactions. Some works were focused on bodily presence while others addressed the virtual hand in the machine. In contrast to previous years, no 2D wall-hung artworks were
accepted this year to the Art Gallery. Overall, one could say that this year new and non-traditional art experience sense modalities were featured.

Six Art Papers, listed below, were focused on the themes of the Design Computation (Process, Product, Play) and Information Aesthetics.

Jacquelyn A. Martino contributes to the area of computation in the production of artistic form and described a computational system in the form of a curvilinear, parametric shape grammar. She described the grammar that synthesized her drawings in the design; the grammar also served as a tool for self-understanding and to assist her artistic process.

Rizal Muslimin restructured weaving performance into architecture by analyzing the tacit knowledge of traditional weavers through perceptual study and then converting it into an explicit rule in computational design. Three implementations with different materials showed the advantages of using computational weaving that combines traditional principles with today’s digital (CAD/CAM) tools to develop affordable fabrication techniques.

Anthony Rowe and Liam Birtles presented the Glowing Pathfinder Bugs, an interactive art project primarily aimed at children and created by the digital arts group squidsoup (see http://www.squidsoup.org). It used projection to visualize virtual bugs on a real sandpit. The bugs were both “aware” of and responsive to their surroundings. By dynamically altering the topography of the sand participants could affect the bugs’ environment in real time, facilitating direct communication between them and computer-generated creatures. This highly malleable and tactile physical environment defined and carved out the landscape in which the creatures exist in real-time. Virtual creatures and real people coexisted and communicated through a shared tactile environment. Participants used natural modes of play, kinesthetic intelligence, and their sense of tactility to collaboratively interact with creatures inhabiting a sort of parallel world (i.e., of illuminated creatures).

Kim Vincs and John McCormick described the work of a group of artists in Australia who used real-time motion-capture and 3D stereo projection to create performance environments in which dancers seem to “touch” the volume. Dance as “virtual force” realizes the idea of a “virtual haptics” that extends the dancer’s physical agency across the surrounding spatial volume and touches space by visualizing kinematics as intentionality and agency.

Dietmar Offenhuber noticed that the discourse on information visualization often remains limited to the exploratory function—its potential for discovering patterns in the data. However, visual representations also have a rhetorical function: they demonstrate, persuade, and facilitate communication. By means of ethnographic interviews and observations, the author highlighted the different aspects of the visual anecdote, a specific point where the exploratory and the rhetorical functions of visualization meet.

In another experiment, Judith Donath, Alex Dragulescu, Aaron Zinman, Fernanda Viégas, and Rebecca Xiong depicted subjects’ accumulated data rather than their faces. Data included visualizations of discussion contributions, browsing histories, social networks, travel patterns, and so on. These were subjective renderings that mediated between the artist’s vision, the subject’s self-presentation, and the audience’s interest. Designed to evocatively depict an individual, a data portrait can be a decorative object or be used as an avatar, one’s information body for an online space. Data portraits raise questions about privacy, control, aesthetics, and social cognition. These questions become increasingly important as more of our interactions occur online, where we exist as data, not bodies.

The Computer Animation Festival comprised several categories: Production sessions, Live real-time demos, TV and web commercials and cinematics, Computer animation shorts and long shorts. Best in Show award went to “Loom” created by Jan Blitzer, Ilija Brunck, and Csaba Letay. “Poppy” created by James Cunningham and Alex Dragulescu won the Jury award (see http://www.poppyfilm.com), and “The Wonder Hospital” by Beomsik Shimbe Shim got the best student project prize. More info is here: http://bit.ly/bfoMYF.

The Electronic Theater screenings included most of the animations selected by the
jury. There were also special screenings that included student animations and Chinese student animation, animated feature films, visual effects for short films and TV programs, visual effects for live-action feature films, real-time animation, visualizations and simulations. Moreover, in a new Animation Clinic, the industry leaders and masters reviewed student projects and offered creative, production, technical, and career advice. A collection of production sessions complemented the festival screenings.

At the SIGGRAPH 2010 Courses attendees learned from the experts in the field and gained inside knowledge critical to career advancement. Short (1.5 hour) courses and half-day (3.25 hour) sessions included elements of interactive demonstration, performance, or other imaginative approaches to teaching. The spectrum of courses ranged from an introduction to the foundations of computer graphics and interactive techniques to advanced instruction on the most current techniques and topics. The themes of the courses were: Advanced techniques in real-time hair rendering and simulation; Advances in real-time rendering in 3D graphics and games I and II; An introduction to 3D spatial interaction with videogame motion controllers; Applications of visual analytics; Beyond programmable shading I and II; Biomedical applications: what you need to know; Build your own 3D display; Color enhancement and rendering in film and game production; Filtered importance sampling for production rendering; Fundamentals of visual analytics; Gazing at games: using eye tracking to control virtual characters; Global illumination across industries; Image statistics: from data collection to applications in graphics; Perceptually motivated graphics, visualization, and 3D displays; Physically based shading models in film and game production; Processing for visual artists and designers; Recent advances in real-time collision and proximity computations for games and simulations; Spectral mesh processing; Stylized rendering in games; and Volumetric methods in visual effects.

**Emerging technologies** provided interactive demonstrations of innovative technologies in a broad range of applications, including displays, robotics, input devices, and interaction techniques.

**Two Keynote speakers** shared inspiring stories and predictions in computer graphics education and technologies with interested attendees. Don Marinelli, Executive Producer from the Carnegie Mellon Entertainment Technology center and Jim Morris, Executive Vice President of Production from Pixar Animation Studios.

There were also presentations on developments supporting programming and animation, for example, HTML 5, Processing and Animux (tools that are freely available). While no educational program was available this year at the Conference, two panels under the auspices of the Leonardo Journal focused on new trends in education.

**The 2010 achievement awards** were awarded in four categories: the Computer Graphics Achievement Award went to Jessica Hodgins, the Significant New Researcher Award went to Alexei “Alyosha” Efros, the Outstanding Service Award went to Kellogg Booth, and the Distinguished Artist Award for Lifetime Achievement in Digital Art went to Yoichiro Kawaguchi.

**The technical papers (part I)** comprised several sub-sections that focused on: Computational photography, Editing motion, Lighting and material design, Elastic models, Faces & capture, Architectural patterns, Fluids I and II, Stylized rendering & illusions, Rendering hair & scattering, Expressive rendering & illustrations, Fabrication, GPU rendering, Physics-based sound & bubbles, Sounding liquids, Planning & terrain, Displays and eyes, Geometry, and Algorithms & sampling.

**The technical papers (part II)** comprised several sub-sections focused on: Collisions and contact, Boundaries, Edges & gradients, Textures, Video, Perception, Urban reconstruction and explanation, Appearance capture and image processing, Understanding shape, Cloth animation, 3D modeling, Perceptual rendering methods, Meshing, Surface fields, Human modeling, Image enhancement, and Biped control.

**Game Papers**, as described by the chair Richard Wainess, featured original work from
creative and technical communities that design and develop commercial and non-commercial video games, and from academic research communities that study video games, game play, human-computer interaction, learning, and related technologies. Game Papers related to a wide range of video game design and development topics (theory, practice, methodologies, and criticism), explored key issues, advanced our knowledge and understanding, and fostered new areas for investigation that will drive the next generation of player experience.

SIGGRAPH Dailies is a new program that celebrated excellence in computer graphics by showcasing images and short animations of extraordinary power and beauty. The works were for film, games, or anything between, and present the state of the art – and craft – of computer graphics, and displayed excellence in modeling, shading, animation, lighting, effects, and more.

Posters, displayed throughout the conference presented student, in-progress, and late-breaking work. Poster authors were meeting and discussing their work with attendees during Poster Sessions. According to the SIGGRAPH 2010 Director of Research Cindy Grimm, poster topics ranged from applications of computer graphics to novel interactive techniques to in-depth research on specific topics. Posters also presented work submitted to the ACM Student Research Competition.

Talks provided a broad spectrum of presentations on recent achievements in all areas of computer graphics and interactive techniques, including art, design, animation, visual effects, interactivity, research, and engineering. James Mohler, SIGGRAPH 2010 Director for Education, said that talks could take you into the minds of SIGGRAPH 2010 creators. They provided a lightweight alternative to formal publication. Talks highlighted the latest developments before publication, presented ideas still in progress, or showcased how computer graphics and interactive techniques are actually implemented across many fields.