

The Ivy Tower of Entertainment Technology

Carnegie Mellon's Entertainment Technology Center Creates a Leisure Laboratory

By David Polinchock

Author's note: As someone who has been involved in new media since working with virtual reality in 1991, I have had the chance to work with a wide variety of companies developing amazingly cool technologies. Some of the most exciting came from Carnegie Mellon University in Pittsburgh, where I met Don Marinelli. Now, seven years later, Don is the co-director of an exciting new program at CMU, the Entertainment Technology Center.



recently spoke with Don about the program in general and the work that they are doing this year.

David Polinchock: Don, could you give us an overview of the ETC, including how & why it got started.

Don Marinelli: The ETC is an initiative from the office of CMU President Jerry Cohon. The idea came about originally though from then-Dean of Computer Science, Raj Reddy. Dr. Reddy had been part of an advisory board that recommended creation of an Entertainment Technology Center at the University of Southern California. He returned to Pittsburgh and CMU and realized that with our long history and accomplishments within the College of Fine Arts, and the world renown of CMU's School of Computer science, there wasn't any reason why CMU couldn't establish an Entertainment Technology Center.

DP: What is unique about the ETC among other college programs?

DM: The first thing unique about the CMU ETC is that it has co-directors. This reflects the fact that the ETC is a joint initiative by the College of Fine Arts, Martin Prekop, Dean, and the School of Computer Science, Jim Morris, Dean. This co-directorship also reflects the fact that the field itself is so new and evolving that finding a single director possessing the necessary creative and technical skills was considered well

neigh impossible. The co-director notion also stemmed from the fact that we believe that neither technologists nor creative-types can be considered to be working in the "service" of the other. Lastly, it was the university's hope that in this endeavor the old adage, "two heads are better than one," would be borne out. It definitely isn't cheaper!

Additionally, the Entertainment Technology Center (ETC) of Carnegie Mellon is built upon three foundational pillars:

- 1) Academics;
- 2) Service to the industry; and
- 3) Entrepreneurialism.

The former is manifest in the two-year Master of Entertainment Technology (M.E.T.) degree program conferred jointly by the university's College of Fine Arts (CFA) and School of Computer Science (SCS). Carnegie Mellon is rare among US universities in being able to offer this kind of degree, as we possess both top-quality fine arts programs as well as premiere programs in technologies such as computer science, electrical and computer engineering, and robotics.

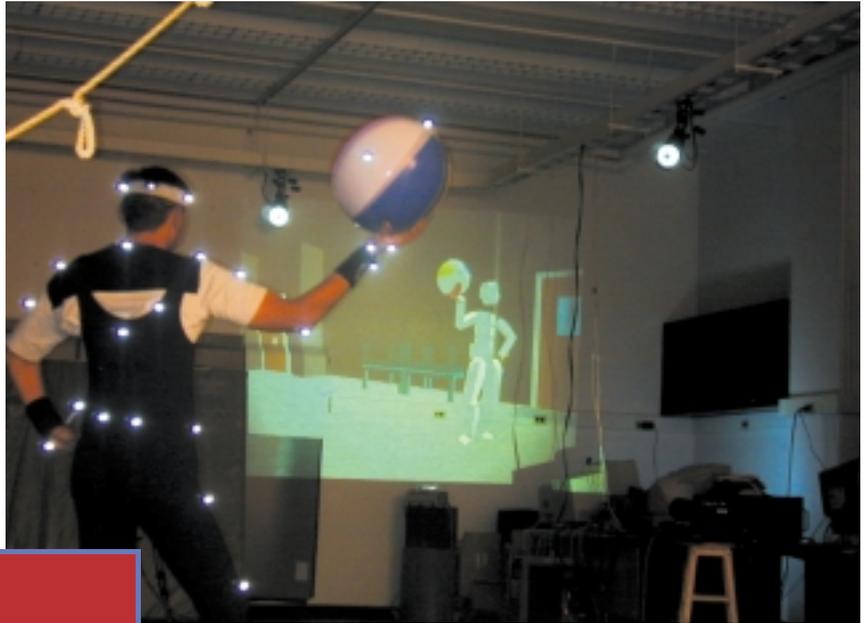
Service to the industry resides in our network of corporate sponsors who provide myriad internship and employment opportunities for ETC students and graduates, and whom we assist in research and development. Entrepreneurial initiatives within the ETC aim at connecting students with the Donald.

T. Jones Entrepreneurial Center within the Graduate School of Industrial Administration where ETC students may take classes in how to establish their own high technology companies. In addition, there are frequent visits by officials from the Carnegie Mellon University's Office of Technology Transfer that are well versed with every aspect of the entrepreneurial process.

DP: How was the faculty selected?

DM: It was decided at the outset that the ETC would not possess its own tenure-track faculty lines. This was motivated by the belief that faculty members needed to have a background in one of the more traditional art forms or technologies, rather than being groomed entirely within the fledgling field of entertainment technology. The ETC boasts a growing cadre of adjunct and visiting faculty from around the world, as well as a growing number of faculty from other colleges and schools within CMU. We thrive on visitors from the various fields of entertainment technology: theme parks, virtual reality, linear and non-linear storytelling, television and motion picture industry, the gamut.

As the program and the field itself develop, we envision faculty coming increasingly from within the industries.



The ETC seeks industry partners with whom it can undertake research and prototype development.

DP: How are students recruited and selected?

DM: One of the things we discovered was that prospective students for the ETC are very technologically savvy, even those with arts backgrounds. All of our applicants discovered the ETC through Internet searches, or through word-of-mouth. We had over 100 applicants for this year's program from which we accepted roughly 25 and wound up with a very solid yield: 20 students. These students are divided roughly 70-30 between those with a strong technology background and those with a strong arts background. We are discovering, however, that an increasingly number of young people are creating undergraduate majors that support their interests in entertainment technology either by double-majoring in an art and technology, or through pursuit of one or more minors in ancillary disciplines.



DP: One of the key elements of the ETC program is your Directed research programs. Can you tell us about them?

DM: As part of its thrust towards 'real world' research, the ETC seeks industry partners with whom it can undertake research and prototype development. In the same way that CMU has always been known in the fine arts as a "learn by doing" environment, so it is with entertainment technology. We want our students to team up with both university professors and industry representatives as they undertake R&D with new forms of technology and experience creation.

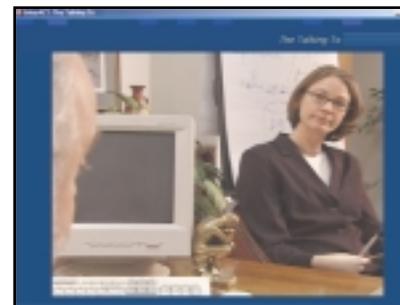
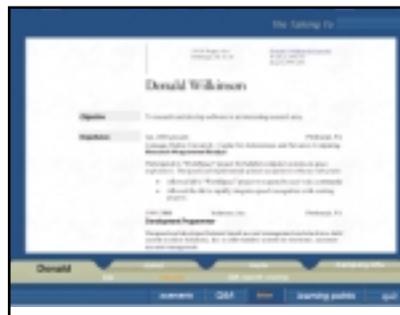
As part of the entrepreneurial goal of the ETC, partnerships and relationships are being established with a wide range of venture capital funds and individuals, New Jersey-based Location Based Branding being one of the prime movers. Additionally, an on-going relationship has been established with the university's Office of Technology Transfer, which specializes in licensing technology created at CMU to industry. A large number of ETC students also enroll in courses offered by the Donald T. Jones Entrepreneurial Center of the CMU Graduate School of Industrial Administration.

DP: Describe some key projects that would be of interest to this audience. Of course, we don't want to speak just to museums, but to the LBE/educational audience as well!

DM: Since the whole basis of the ETC program is to create opportunities for having technologists and fine artists work together, it is important that we have opportunities for them to "create" something as a part of the program. Last year, we had several exciting projects come to fruition at the ETC, including:

Earth Theatre

The great thing about EarthTheatre is that it was driven by the desire to create an interactive audience experience. The mandate was also provided to the students that this group audience interactivity could NOT be achieved through the use of armrest buttons or Cinematrix wands. We posed the question as to whether you can have a group experience that wasn't essentially a 'voting' exercise. Past experience showed that having 34% of an audience decide



where to lead people was as problematic in entertainment as it is in politics!"

As outlined by the students, the goals of EarthTheatre's first project, Pirates, included:

- To take advantage of the immersive potential of the space:
- To have the audience to feel as though they are on the ship with the captain in order to get the full experience of the theater
- To create an interactive experience that engages the audience in activity.
- To make the experience more fun and compelling, by allowing the audience to be able to interact with the story
- To tell a story worth hearing again.
- To effectively use on-screen narrator to guide experience.
- To explore the possibility of having a virtual or on-screen guide and how well it is able to direct or instruct the audience on what they have to do.
- To break the social barriers associated with theater.
- For our presentation, we wanted to have the audience physically move around the space and interact not only with the screen but also with others. Today, most interactions that are made usually involved having the audience do as little as possible. Through this manner, we are trying to break the social barriers usually associated in public viewing venue
- To increase repeat value through non-linearity. So that people would come back again, we wanted to stress interactivity in order to cause non-linearity of the plot. In this manner, no two shows are exactly alike.
- To blend the physical environment with the screen environment.
- As part of our goal to having the audience immersed in the environment, we also decorated the theater with a lot of props so as to make the theater look more like the deck of a ship. In this way, we are extending the illusion of being on the ship more

We recently added a second show to the EarthTheatre Cretaceous Chaos . In Cretaceous Chaos visitors to the Earth

Theater are invited aboard a time machine and catapulted back in time 72 million years to the Cretaceous Period! This allowed us to create a compelling and truly immersive experience, that would not only educate the audience about dinosaurs, but engage them in a way that would “seal” the learning in.

Doc Beardsley

Our goal is to create technology that enables animatronic figures to become conversationally interactive. Further goals include allowing these characters to become aware of their environment, and react accordingly.

The goals were met by combining a multitude of technologies (speech recognition, synthetic interview, discussion engine, audio, vision, and animatronic technologies) resulting in a new medium for interactive entertainment.

Jam-O-Drum

Jam-O-World is a social installation that brings together groups of people for collaborative gaming and music-making experiences. Players use novel input devices to control real-time computer graphics that are projected onto the tabletop surface. There are currently three experiences that have been developed by ETC students:

Hip Hop

Tokli, a robotic rock-star rabbit and his Latin band take the stage at the Zeum Youth Art and Technology Center in San Francisco. Together, guests at the Jam-O-Drum control the band’s music and Tokli’s dance to create a unique performance for other observers in the space.

Circle Maze

The Circle Maze is a multi-user interactive musical game that encourages team building and collaboration. By combining novel input devices with real-time computer graphics on an integrated

tabletop surface, the CircleMaze brings together a group of players to participate in group gaming and music-making. Each player has a Lazy-Susan-like input device with which he or she controls visual and aural facets of the game.

Rhythm Breaker

Rhythm Breaker is a competitive musical game. The players are expected to play the drum pads matching the rhythm of a backing track. If a player is playing well, waves, or ripples, are emitted from his/her pad. The waves push a moving object, referred to as the puck, away from the player. The objective of the game is to push the puck off the edge of the table, and if the puck is pushed off the table on a player’s side, he or she loses.

Puppeteer Animation

The Dialog Engine project is a joint venture between the Entertainment Technology Center at Carnegie-Mellon University, San Diego-based game developer Angel Studios and artist/sculptor/ musician and writer Frank Garvey.

The goal of the project is to create a software tool which allows authors (not programmers) to take written character dialog and transform it into interactive character conversation. To accomplish this goal in the 14 week duration of the project, we will be leveraging tools and technologies that already exist in the fields of computational linguistics and natural language processing.

Future additions to the engine would include character training and advanced text-generation capabilities. Ultimately, the goal of the project is to create convincing, engrossing and identifiable characters with whom guests will wish to have multiple conversations.

Synthetic Interviews

Synthetic interviews have direct application to interactive entertainment. As part of the interactive experience the

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user may talk to characters, interview them. This exploration of characters draws users into the fantasy. They can discover plot elements and find solutions.

Some of today's interactive products make claim to bringing the viewer "behind the scenes." Most high budget films pre-sell through short documentaries in the "Making of. . ." form. Synthetic interviews will bring a new meaning to this facet of entertainment products. Now the users themselves can interview actors, directors, producers, writers, or any contributor to the film.

The most heavily used World Wide Web applications today are text "Chat Rooms." During our star chat session with Pamela Anders the enormous load forced Prodigy to shut down and restart its entire service. Imagine if fans could "talk" to their favorite entertainment, sports, or political figure. Synthetic interviews can bring this experience

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into every home.

A good way to learn about the culture, society, people of a nation is to talk to its inhabitants. Synthetic interviews will allow you to do just that, explore the psyche and motivations of the major characters of the world.

A player can learn about the inner workings of any of the primary and secondary characters via synthetic interviews. The player can then assume the persona of that character and attempt to realize the goal or objective within the existing storyline, by creating a parallel storyline, or a completely different storyline. This will allow for the development of unlimited outcomes and adventures.

Going beyond "the-making-of. . ." users will be able to talk to the actors, director, and principals in the production. What if today, we could ask Orson Wells his motivation and inspiration for Citizen Kane? Or, imagine creating a Synthetic Interview using the film archives of Dr. Martin Luther King and allowing children to have a discussion with him about the civil rights movement of the 1960's? The

possibilities to create truly engaging educational experiences are endless.

DP: How would you sum up the Entertainment Technology Center?

DM: The "high concept" behind both the Center and the Masters program is that we are based on the principle of having technologists and fine artists work together on projects to produce artifacts that are intended to entertain, inform, inspire, or otherwise affect an audience/ guest/player/participant. The master's degree is focused on project courses. Because the larger challenge we face in authoring new media is bringing together different disciplines. The Master of Entertainment Technology degree program is driven by trying to do this as effectively as possible.

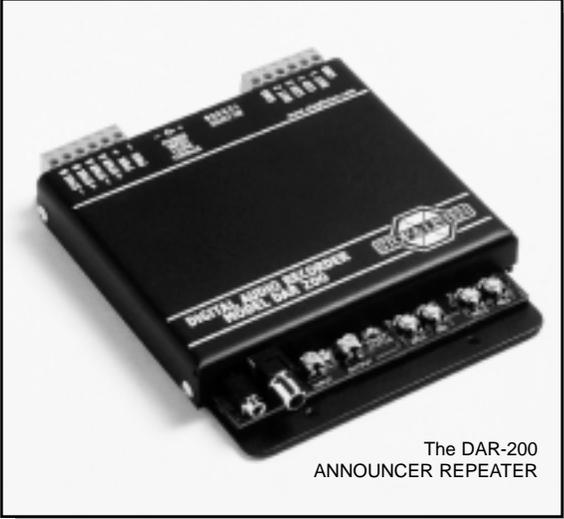
We do not intend to take artists and turn them into engineers, nor vice-versa. While some students will be able to achieve mastery in both areas, it is not our intention to have students master "the other side." Instead, we intend for a typical student in this program to enter with mastery/training in a specific area and spend his or her two years at Carnegie Mellon learning the vocabulary, values, and working patterns of the other culture. This learning will be evidenced by their ability to work effectively with those who are expert in it.

If we can achieve these objectives, we will be able to create the best educational experience possible while creating the exciting new storytelling tools of the future.

Additional information about the Entertainment Technology Center or their sponsored research programs can be found at www.lbbinc.com/lbblinks.html.



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