Artificial Stupidity/
Artificial Intelligence

August 1-4, 2002

This event is a part of The Banff New Media Institute's
Human Centered Interface Project.

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The Banff New Media Institute at the Banff Centre for the Arts
August 1-4th 2002

From August 1st to the 4th 2002, the Banff New Media Institute (BNMI) at the Banff Centre for the Arts hosted and facilitated "Artificial Stupidity/Artificial Intelligence" (AS/AI) a symposium on the creative possibilities and limits (if any) of Artificial Intelligence (AI). Lead by Sara Diamond, the executive director of Media and Visual Arts, "Artificial Stupidity/Artificial Intelligence" addressed the questions of the capabilities of affective computing in our ability to shape qualitative experiences that represent the fuzzy line between computation and intelligence. Begging the questions of how much a machine can or cannot do and how much is left to our own representation devices, AS/AI, looked at the boundaries of computation and our own interpretation of exactly what intelligence is. With current applications in the analysis of large bodies of data, game play, understanding speech, and the mapping of learning, how far we can take computation in our plight to understand our own cognitive and social systems is unknown. Amongst others questions, this symposium addressed the larger question of "are artificial intelligent systems only as stupid or intelligent as we choose to make them". Bringing together artists, social scientists, researchers, game designers, and A.I/ A.L. experts, the forums of AS/AI focused on the wide range of applications, roles, and possibilities of artificial intelligence.

Thursday, August 1st

9:00am – 10:00am
Welcome and introductions
Sara Diamond – Executive Producer, TV & New Media, MVA, The Banff Centre

Sara Diamond introduced the event with a brief history of the Banff New Media Institute and some of the objectives they hoped achieve during the summit. With a history since 1994 of bring together people from a wide range of disciplines to look at cross-disciplinary issues and questions in new media, the Banff New Media Institute is special place for collaboration and communication. Bring cultural science, humanities and computing science together to promote dialog of the issues of practice, philosophy, and hard science on how we can collaborate together and work through the issues of new media. With new media being a large complex area, Diamond defined it as an umbrella term to address a diverse area including nanotechnology, genetic engineering, computing science, gaming, and interactive experiences. With all those disciplines addressing the cultural marriage of humanities, social sciences and computing. With a brief background on the centres previous symposiums including "Unforgiving Memory" and "Big Game Hunters", Diamond outlined how the dialog of these symposiums brought about questions of practice and philosophy. From these forums the questions of human machine interactions, avatars, virtual worlds and machine intelligence presented itself.

With the overall theme of the conference of Artificial Stupidity or Stupid A.I., the aim is to understand more clearly what machines can do and how it can be quantified. Looking at the questions of the human experience and machine intelligence, the conference looked at the range of topics that populate A.I. Emotional and affective computing, machine intelligence in games, speech analysis, data, and our understanding of machine consciousness, the symposium aimed to bring about a dialog of the blurring between human experience, Stupid A.I. and A.I.

10:00am – 12:00am
Imagining Machine Intelligence
Phoebe Sengers, Herve Fischer, Rita Lauria, Ben Whittam-Smith

Phoebe Sengers, Assistant Professor, Cornell University

Phoebe Sengers, an assistant professor at Cornell University, and the first speaker of the forum generated a buzz with her talk “Interpreting AI: Some Heuristics”. With a background in artificial intelligence, human computer interaction and cultural theory, Sengers talk focused on her interest in what A.I is and how it could be better. With a broad understanding of the cultural roots of A.I, Sengers views A.I with many questions as to the function, impact and future roles.

In observing the behaviours and the multifaceted nature of both animal and human interactions with the outside world, Sengers noticed that our ability to simulate these entitles was somewhat limited. With the simplification and breakdown of entities as parts, rather than addressing the interaction/entity as a whole, we were missing the richness of the original being. Sengers went on to say that the mere modeling of an interaction or agent in the normal way of programming A.I always ended with a simplistic model of the interaction which subverted what we were originally interested in the first place. This way of modeling behaviours or interactions, which is prominent today, is not sufficient to capture the essence of the being. These flaws lead Sengers to start critically evaluating A.I in its application and synthesis in the realm of interaction.

What Sengers found in her work was that the current approach to programming A.I was flawed. That breaking behaviour or interactions of an entity into components does not represent the organism or its interactions. With the scientific process of dividing everything into specialized quadrants and trying to understand each really well, we miss the whole picture. With the adage that “Sometime the parts do not make the whole”, Sengers went on to say that when we focus on the parts we miss what made the whole so interesting and complicated. So with setting the stage for the flaws of current A.I interaction programming, Sengers posed the question, “is there a way to do A.I in a way that respects and represents the whole?”

Sengers answer to this question was that we should not focus on the models that try to mimic human behaviour or action, but to bridge the formal models of the code and the human being who is interacting with the system. Outlining the heuristics of how to build the bridge between humans and computer models Sengers gave three main points.

The first point was to instead of trying to represent and model the complexity of an entity, we should be trying to trigger complexity from the user. This way we would create an experience of complexity that is user centered. An example of this would be to communicate to the user the idea of what cat ness is all about, instead of trying to model the behaviours of a cat. This way of programming complexity allowing the user to interpret the information and build the complexity of cat through there own devices. In reference to Agent architecture, building characters that interact through narrative with the user, the activities of agents and their complexity is in the mind of the user, which contributes to a fuller experience.

The second point Sengers made was instead of trying to represent this complexity we should be trying to bootstrap from it. With live triggered systems; we can represent complexity from the users interactions with the computer. Because the computer reacts to the users input in real-time, it seems to represent a complex system. This feedback system is a way to get complexity into the system without programming it at all.

The last point made was that we should look at the means of the user, as oppose to the information that is contained in the system. This idea based on affective computing, aims to extract the feeling of the user to drive the system. Focusing on affective information as apposed to affective feelings.

With these outlined, Sengers finished her talk with the suggestion that A.I. should be H.C.I. With these two linked we could build continuously evolving systems built on the human aspects of the human computer interface and it's interactions.

Hervé Fischer, Chair Daniel Langlois for Digital Image and Sound, Concordia University

Herve Fischer, the second presenter of the day, in his talk "Human Memory, Computer Memory" looked at machine and human memory, the complexities, fallacies, and, future connections.

Starting his talk with the notion that we must look to the past to rediscover what memory is, Fischer outlined how memory in the human sense, is completely different from computer memory and that these systems are no were near equitable.

Relating that something as simple as the power of smell to trigger memory, we see that memory can be triggered at any instance in or out of the context of the

users experience or environment. This power within human memory can bring forward long past experiences and memories that were not consciously brought forward, but triggered. This complex system is something that we don't understand and is not possible in a computer due to the subjective nature of how the memory is brought about. This idea of unconscious memory and unconscious retrieval is something that is problematic in computational/machine memory models.

Commenting on Freud's idea that memory is something that never disappears, Fisher went on to say that our unconscious memory stores everything that we experience in a system that is not understood. This idea of unconscious memory is very important in the relation to computer memory, in that we don't understand how it presents itself or how it could be repressed or related to computational models of memory. With most human memory having irrational links that can present itself at anytime anywhere, the computational model of memory has no where near the ability or complexity to mimic or compete with this system. With machine memory being a very simple system, superficial in comparison to human memory, we see that the power of machine memory is quite crude in comparison.

Moving to the relationships of the vulnerability of machine memory to human memory, Fisher talked about the dangers of the transfer of information from traditional systems to machine memory.

With the Freudian idea that human memory cannot be erased, we see that in relation to machine memory, which can easily be lost or erased, there is vulnerability. Relating this idea in his book "Digital Shock" Fisher relates that the "law of memory" is that the more power and sophisticated the system is, the more vulnerable the memory is. Using the analogy of a painted picture on a cave wall that could last 30000 years or more, Fisher outlines how digital memory, in the sense of CD ROMS and hard disks, storing the same information, can be easily lost or rendered unusable. Even with extremely sophisticated systems there is no means to record everything.

With millions of dollars and resources going into digitizing information, we should be able to record memory. But the fallacy of this notion is that we cannot record everything. An example of this is the evolving architecture like the web. As we can see in the short life of the web, we cannot capture the process. As WebPages are built and improved on, the old versions disappear. In this example we see the history of websites disappearing everyday with its evolution, with no memory of how it evolved. Even with the improvement of hardware, we see that the devices that are used to store memory are obsolete, far from the paradox of the paintings on the wall. This paradox of vulnerability with complexity, warns Fisher, has to be brought to the forefront of our minds when dealing with memory.

Rita Lauria, Research Associate, Media Interface and Network Design, Labs of Michigan State University

The third presenter of this group was Rita Lauria, a research associate of the M.I.N.D labs at Michigan State University. In her presentation “M.I.N.D. Lab” she talked about the work at M.I.N.D in the areas of human-computer interactions and intelligence augmentation. With a focus on two main areas of human-computer interaction research and 3-D virtual environments, Lauria, specifically looks at the design and philosophy of virtuality.

Asking the question of “what does virtuality imply”, Lauria, outlined that virtuality implies, a simulated reality that has a distinct line between what is real and what isn’t real. This distinct line or the “virtual barrier”, as Lauris calls it, is the place where simulation and reality begin to fuse. With this ability to blur the real and virtual, we see that virtuality has the ability, not only generate known realities, but new realities.

The system of virtuality, however, is often misrepresented and misunderstood as virtual reality. This common misconception however can be easily put to rest with the distinction that virtually does not represent reality, as VR does, but interprets and restates reality.

Exploring this idea further, Lauria moved on to the current media environment of high bandwidth telecommunications. Seeing the ability of our interfaces to interpret and restate reality, Lauria expressed that there is still dependence on how advanced the system is. Looking at four dimensions of telecommunication interface evolution, Lauria outlined each.

The first dimension is the level of mediated environment, which refers to the degree in which the users body is hooked up to the telecommunications system. The second is the level of interface intelligence, which is the interfaces ability to interpret, adapt, and respond to the users behaviour. The third is the ambiguity of access, which is making make our interfaces more mobile. And the last dimension refers to sociability, or the number of users that the interface supports and the quality of interactivity contained within.

These interfaces are a part of what Lauria calls participatory systems. These systems have the ability to generate and interpret a representation that is totally different from reality. Virtuality in these systems is used to make the representations seem real. With that distinction, Lauria went on to say that virtuality is the conceptualization of “seeming”. That the realities and representations are projected and perceived, or “seem” real. This allows the system to be prescriptive with their representation, rather than descriptive. Looking at the inclusive nature of virtuosity systems, we see that inclusion becomes a part of the system. We are then in the information and a part of the information. This then influences a paradigm and possible cultural shift. With this

in mind and asking the question of where we are in the idea of virtuality, Lauria presents six conceptualizations that are present in literature that support the idea. Namely social richness, realism, transportation, immersion, the social actor within medium, and the medium as social actor.

Finishing with the important idea of presence in virtuality, Lauria defines it as the ability to project ones mind through the use of media. This “allusion of perception” is the extent in which the person fails to perceive the medium during a technologically mediated experience. This idea, Lauria presents, is observable in how we respond to a comedian on television. With little regard for the medium, we respond to the comedian as a presence.

Concluding that the condition of virutality is hear to stay, Lauria, asks the larger questions of; is there any universal truths that can be addressed and interpreted through this medium.

Ben Whittam-Smith, Notting Hill Publishing Ltd,

The last presenter of the morning, Ben Whittam-Smith in his talk “Concerning Intelligence: Consumer Perspectives,” talked about leaning from consumer reactions to A.I. systems and their applications in entertainment. Looking at three products that Whittam-Smith has worked on, he presented what was learned through the implementation of these systems in the area of human computer interactions and empowering interfaces.

Starting with “Dance DNA”, an application that encourages the user to breed and make 3d objects and animations that dance to music in real time, Whittam-Smith outlined how he used genetic algorithms and neural networks to create a type of interface that allowed the user to make these models with little skill. With a very simple interface, users could create, mutate, and populate the space with new objects and animate them to music in little time.

The consumer response to this application was overwhelmingly positive. With consumer points that the application was compulsive and addictive, and that they could see their music anew, the project was an overwhelming success. With other aspects of the ability for performance, there was a large response for the further development of this project. Other aspects of the consumer response however, lead to surprising revelations.

Finding that users were quite happy to attribute intelligence to the system and that it didn’t really make a difference if the system learned from the user or not, lead Whittam-Smith to certain conclusions. Also that the perceived intelligence of the system was based on a case-by-case basis, lead Whittam-Smith to think that intelligence may be a localized occurrence. Using this information to build his second project, Whittam-Smith again looked at a system that reacted to music.

With the role/goal to use A.I. to create empowering interfaces, in the second project “the blue player: hitting the spot” a bluebug in the interface reacted to music. Displaying different graphic images based on the sound input, a series of sequences based on the music would be displayed. This system again facilitated the consumer to attribute the application with intelligence. With little regard in how it worked, the interface had the attributes were the consumer felt included in the interface.

Looking that the third product “emergence”, built using chatbots, Whittam-Smith looked at stimulus response case based reasoning. Wanting to see if what was learned from the previous projects was still relevant, “emergence” tried to trigger complexity through the user. Using mobile phones because of their ubiquitous nature, their ability to act as both transmitters and receivers and because they are always on, made for an easy medium to do the test. What was found was that trying to use generated content from a chat bot to stimulate or trigger content from the users stimulated a very high consumer response and engagement.

Finishing with the point that social agents can stimulate and coordinate information flows, Whittam-Smith warned that they must know their place. With the ability for the computer and interface to empower the user, the power game is something the computer has to loose.

1:00pm – 2:00pm
Getting Down to Data: Large Scale Data Sets, Intelligent and Subtle Narratives
Andrew Salway, Zack Simpson

Andrew Salway, University of Surrey

Andrew Salway, a researcher in intelligent multimedia information systems in his talk, “Intelligent multimedia data systems: adding structure and meaning to data” talked about information extraction techniques for multimedia.
Exploiting collateral text that is associated with many complex multimedia artifacts, including paintings, dance, scientific literature and film, information can be presented in descriptive form that allows the information to be archived, accessed and manipulated.

Pointing out that the progress in the direction of intelligent data systems is based in the idea that the machine must have a means to understand the structure and meaning of artifacts, Salway goes on to say that this starts with giving the machine the means to add meaning behind the artifact. Illustrating this with an example of how a movie is organized into a sequence of moving images and frames with a specific name, the machine sees this as a file with a name and size. Both of these views also contrast the human’s view of the movie as characters, theme and story. These attributes however, should be included in the machines structural meaning of the file so that interactions with the media follow on many levels. Moving on to another example, Salway sees the file

structure on DVD's, where scenes can currently be accessed, in the future being able to access more complex information like scene action or theme.

The role of A.I in this process is to move the machine into appraising what the human experience is, in these contexts, and move some this complexity into the machine.

So with that vision, Salway asks the questions; "where are we going to get the structure and meaning from." Answering this question, Salway approaches this from a linguist's point of view. Exploiting collateral text, and looking at what people are saying and writing about the multimedia as an asset, these systems could be empowered to do a deeper analysis of the asset. There is however still a divide between what the text says and the meaning or experience of the multimedia.

Moving onto working with movies with audio descriptions, Salway asks the question on whether text descriptions can be linked with narrative so that the user gets the full experience of the action and narrative of the story along with the dialog? And moving to the next level of the question, Salway wonders if there is a way of linking the text with the movie by some form of machine linkage that understands narrative?

With no current answer for these questions, Salway gave an example of audio description by showing a snippet of the film " The English Patient". With the description on, it was seen that the potential of audio descriptions to follow and fill in narrative, apart from the visual, was sparse but effective. The problem now comes with having a machine understand these connects.

Currently looking at TIWO (television in words). Salway, has analyzed temporal information and "emotional words" in 85,000 word copies of scripts (12 movies). Looking at emotion words as a part of a review of information extraction technology, Salway sees how these words map to the action and description.

Finishing with a "wish list" of future data systems, Salway looks to a future where complex video queries can be made on any data field of theme, scene, information, or even character clothing. Also having the ability to summarize the action, theme, or through points of a film, with a "why" button to bring the user up to speed, is a future that Salway hopes to build and contribute to.

Zack Simpson, Artist and Researcher

Zack Simpson, the former Director of Origin entertainment and currently an interactive instillation artist, talked about game design, the taxonomy of game A.I, and the role of A.I in character and narrative.

Starting his talk with saying that most game developers know little about A.I, Simpson, related that the priorities of most game designers are graphics. Giving

a definition of A.I in the sense of academics as “intelligence” and the definition of A.I. to game programmers as “randomness”, Simpson relayed that A.I. in the game development world is still built around perceived game intelligence as opposed to programmed intelligence. Looking at a few genres of games, such as racing games, sports, action, etc, and how A.I applies to each, Simpson, outlined how each could be addressed with A.I. but a lot of the time are not at all.

With the cardinal rule of “games must be fun”, many discussions go into how to make games better, more interactive and more challenging. These discussions however are mostly related to perceived game agency. Relating that the magic thing about games, apart from other forms of entertainment, is that they create a form of agency in the player. Observing that in game play we always relate as first person, we define ourselves as doing the action in the game as opposed to the character. Even when the game has a defined character, like Mario or Lara Croft, we still relate in the first person, which allows game designers to play in the realm of perceived intelligence with few issues. With the player building a cerebral idea of what intelligence exists in a game or characters, there is little needed other than randomness to make people believe that there is intelligence.

Relating to a story of porting one of the first text based adventure games from the apple to the TRS80, Simpson looking at the code found that all user input was put aside due to a mistake in the program and that all interaction was random. And even with that known, through game play, there still seemed to be some sort of agency working in the back. Relating to another story, Simpson went on to say that the art of game design is not in the complicated programming of the game and it’s agents, but in the art of smoke and mirrors used to make people think that it is more difficult than it is.

With gamers becoming more sophisticated, they now can see through the smoke and mirrors of game design of the past. With that known however, with the ability of the game to process information many times faster than a player can, there is some scaling back of the A.I so that the player can continue in the game and win.

In summary, Simpson says that Game A.I borrows little from academic A.I in most instances and A.I is often implemented at the last minute with heavy doses of randomness. With the distinct role of the character to create player agency, Simpson sees A.I in games, not as a means to create virtual people, but as a means to create interesting play.

2:15pm –4:15pm
Imagining and Creating Intelligent Characters
Ken Perlin, Adam Frank, Mirjam Eladhri, Ralph Guggenheim

Ken Perlin, Professor Computer Science, NYU and coDirector of CAT Lab

Ken Perlin, a Professor of Computer Science at NYU media research lab and the coDirector of the CAT lab, looked at character emotion in his talk “Characters and

Artificial Stupidity." Starting with the idea that complexity lies in the mind of the user, Perlin's work tries to create the illusion that the animations have some type of intentionality. Using an array of examples to demonstrate this point, Perlin shows that A.I. interactions do not have to be complex to have the perception of complexity.

"Kinetic Poetry" an applet that looked like word fringe magnets, had an interface where words hopped across the screen trying to find their mates. With little intelligence programmed in, the words tried to find their "mate words" based on the sequence they came from in a story. Showing how we can start to create our own meaning from the simple interactions of these words, Perlin shows that simple interactions can be perceived as intelligent.
Moving on to an applet that aimed to emulate the endearment of an animated heart, "Tameras Heart", showed how the simple interaction of the mouse can have an interesting effect. With simple attributes such as the ability to follow the mouse and fall asleep if not stimulated, the heart gave the perception that it was somewhere between being alive and an extension of the user. This perceived in-between is what Perlin calls "Indeterminate Agency". This idea also follows his work at NYU in the "Improv Project." Creating high-level characters that can be controlled by the user, Perlin also programmed the characters to act in ways not controlled. This perceived agency allowed the user to read more into the characters actions then were actually programmed in. The problem with this, however, is that we don't know the amount of interaction that is needed to attribute agency to the asset.

To test this, Perlin created an applet that mimics facial expression. Used to see how much expression was needed to convey the affect of the character, Perlin found that many small expressions could bring about new interpretations. Used to teach kids with affective disorders what different expressions looked like and mean, the faces helped in ways never perceived.
Moving this idea to the body, Perlin created an applet that could pose on any number of variables. Breaking body language down to its simplest attributes, the characters were also programmed with a sense of awareness of were body parts were. The important aspect of this is that in this awareness, as their body language changes, there is a change in their affect. This way characters could be more realistic in their interaction through the computer with the user, avoiding the current game characters with little affect.

Finishing his talk with the idea that complexity is in the mind of the user, Perlin relates that the impression of agency and complexity can be just as effective as it being hard coded. Further to this, Perlin iterates that the model psychology of the observer is key to complex A.I systems and that we have to remember; there's nobody here but us.

Adam Frank, Artist, Inventor, Software Designer

The second speaker of the afternoon was Adam Frank, an artist, software designer and inventor of the popular virtual character experience, “Petz”. Looking at a number of his works that exemplify the application of intelligent characters, Frank talked about the idea of generating complexity through the user and emotional/affective computing.

Starting his talk with an application called “AutoLover”, that says how much it loves you, Frank showed early how affect can be instilled through intelligent characters. Moving to “Petz3” and the spin offs “Dogz” and “Catz”, the ideas that perceived intelligence can be just as, or more, effective than programmed intelligence was exemplified. With users ability to manipulated the dogs and cats in real-time, and the perceived reaction that the entitles on screen act like dogs and cats, plays into the notion of perceived intelligence. The representation of these animals and their actions and behaviors allows the user to perceive them as intelligent. With there ability to fulfill the users expectations of how a dog or cat would act, it allows the user to buy-in to their realness and to start building real emotional connections. Relating that the initial goal of the Petz project was to get user emotional buy-in, the Petz project exceeded its goals.

Moving on to the notion of “cueing perception”, Frank outlined that the interactions of the represented characters on screen, had to do with much of the perceived intelligence. With the characters interactions with each other and also with the user, people could buy-in to and participate in a virtual relationship. Continuing this notion of character interactions, Frank showed his work “3dM3”, a chat program that allows the participants full control of a 3d characters faces as they talk. Looking at the application of this technology into cell phones and its applications of facial expressions directly from speech, affective computing and affective characters could play a large role in the communication systems of the future.

Looking at two more examples, one being the, “Performer”, which works on the notion of positive reinforcement in that it simulates applause the more you move your character, and “illuminator”, were a lamp projects the image of its own light source, Frank finished his talk with the idea that character complexity does not always have to be a complex process. With allowing the user to define the complexity in their interactions with interface and characters, we can move character and affective computing to the next level.

Mirjam Eladhari, Zero Game Studio, Interactive Institute, Sweden.

Mirjam Eladhari, researchers at Zero Game Studio, in her talk “Player entities in Massively Multiplayer Online Role Playing Games (MMORPG’s), looked at the construction, implications, and evolution of MMORPG’s.

With MMORPG's consisting of game worlds of more than 1000 players, MMORPG's offer a unique area in which to research characterization and immersion in virtual worlds. Establishing that the current uses of these worlds are simplistic role-playing models, Eladhari would like to see these worlds evolve. Largely based on player emersion, the focus of most of these worlds is in gaining 'experience points.' This aspect of current MMORPG's contributes to the world's being largely dominated by repetitive combat, where players go around killing things to gain experience points. Although this could be seen as engaging, Eladhari sees this as a misuse of this new game form. Largely dominated by classic games and roles represented in it, MMORPG's have the ability and potential to change the face of games as we know it.

Moving on to the roles and goals of the game studio, Eladhari, outlined how the larger questions of characterization, interaction and socialization in these worlds are being addressed. With the potential for these worlds to be driven by character, there is an unlimited base in which exciting game play could be established. As predefined narrative is meaningless in MMORPG's, there is a growing need for character driven stories. Without this, Eladhari continues, shallow characters and repetitive game play will again populate these unique spaces.

Currently focused on defining what is new, unique and special of these worlds, the team also looks to identify and define the roles of players in these spaces. With this defined, the team can then move into the interactive aspects of populating this world. Looking at what can be done in MMORPG's that we couldn't do before, Eladhari sees the potential for whole societies to grow and be established in these worlds. With that in mind, Eladhari, went on to ask questions of the social nature of MMORPGS. With many examples of these worlds already established (e.g., Acherons Call, Ultima Online, Anarchy Online, Everquest, Darkage of Camelot), Eladhari wants to know how to take character and social interactions in these worlds to new places. Other questions of commercialization of these spaces presented themselves as the actualization of the advertising potential of these spaces were discussed.

Eladhari finished her talk with the goal to start an open source MMORPG engine that could be used to build these worlds. With that as a goal, the discussion lead into an open dialog of collaborations and debates about the potential of MMORPG's and their future roles in gaming and society.

Ralph Guggenheim, producer

Ralph Guggenheim, a former executive producer at Electronic Arts, talked about an innovative online episodic role-playing game called "Majestic". In his talk "Majestic: On-line Episodic Storytelling" Guggenheim talked about the background, production, and experience of developing an encompassing suspense thriller.

Formed in 1999 to focus on online entertainment for EA.com, Majestic served as the first product for the subscription based entertainment service. With a cross-disciplinary team from film, television and games, the team explored all realms of entertainment, story and interactivity.

With Majestic having the slogan “the game that plays you”, the team aimed to produce an episodic thriller that was played out on the web. In contrast to other game, Majestic was a game that came to you. As players got involved in the game, the game would advance your character when it felt that it was appropriate. With the ability to contact its players through the use of phone calls, faxes, instant messages and e-mails to do this, the game blurred the line between fact and fiction.

With the narrative about a bunch of game designers on the run from a secret government agency, the game pulls the player in as an active participant in the narrative. With many players involved and interactions taking place through a multitude of mediums, players had little idea of whom exactly they were playing with. With NPC’s or “Non-Playing Characters” also interacting in the game, players didn’t know if they were interacting with other players in the game or with characters in the story.

Moving to the key innovations of the game, Guggenheim outlined some of the unique advances in game design that Majestic achieved. With an episodic, real-time game that comes to you Majestic offered a unique immersive game environment. Pacing of the game based on storyline, allowed the game to pull characters in as they were needed to continue the story. Also with the story in episodic form, the structure of the overall season long story had to be deconstructed into interactive assets. To follow the actions and interaction through the use of fax, phone, streaming media, instant messaging, web links, email, and web searches, the developers had to break down each action in the story and figure out were each action fit.

Many of the characters in the story were explored and reveled through the use of streaming videos. With streaming media in the game used for easdropping on webvideo conversations, the users could see characters develop and interact. These interactions allowed the users a little deeper sense of the world they were living in.

Moving on to the A.I like activity used in the game, Guggenheim outlined how database triggers, and chatbots were used to sequence events, trigger instant messages and chat with other players. With character driven conversation much of the time, the system handled most of the chat gracefully with it’s large repertoire of plausible responses. But even with many of the features of the game working seamlessly, there were many features that didn’t work.

The amount of leverage that users needed to suspend disbelief to fully engage in the game environment was at times, a stretch. With some of the dialog and

actors, lacking, sometimes it felt like playing a game. Another aspect was the limited knowledge of the characters in the game. Even with many facts, the general knowledge of the characters that were interacting was limited. These factors and their fixes did not get to be realized because on April 30th, 2002, the highly awarded was ended.

This end however, served as a very good base in which to learn about immersive games and subscription based games. Some lessons learning from Majestic, was that episodic multimedia is still in its' infancy. With game based subscription models yet to be proven, Majestic was one of the first to try to capitalize on this market. Some other lessons of Majestic were to built community early and fast, to consider entire online experience and to play more into the audience's expectations when dealing with story and character. Guggenheim finished his talk with saying that he sees a bright future for on-line games and immersive experiences.

Friday, August 2nd

9:00am – 9:30am
Morning Summary
Sara Diamond

Sara Diamond started the morning summary by saying that the there is a need to talk about terms and to move towards defining terms. With participants having a wide range of backgrounds and contexts, Diamond sees the need for a common language. As a part of that common language there is also the need for social, political and cultural context within these discussions. These issues resolved, Diamond iterated, will ensure that communication is inclusive to all.

Moving on to the aspects of the range of works that represent artificial intelligence, Diamond touched on the point that many don't see their idea of A.I represented in some of the works presented. This debate however leads us to question how A.I is constructed and represented in different areas.

Other terms that came about in this debate was complexity and localization. The debate of whether intelligence is delivered and programmed or whether it is triggered in the mind of the user is something that is still needs to be explored and discussed. Continuing, Diamond outlined how the debate of whether A.I is actually HCI, and relates closer to the user as the experience, is something that needs to be explored when we look at agency, presence, emersion, and character.

Agency and the idea of presence and how it's constructed was also a well-debated topic. Whether is constructed by hyperrealism or by the users is debated when the users interact and immerse themselves agency roles. This is reflected in the talks around MMORPG's. With these large multiplayer worlds being populated with many different personalities and representations, that character could play a large role in the agency of the character and also in the agency of the narrative that presents itself.

Other forms of intelligence and memory were also discussed and covered. The suspension of disbelief and how those lines get draw, within or with the system, are a major part of what makes A.I work or be perceived to work.

Diamond finished the summary with saying that, as possible new area for discussions, that the participants should ask the question about how to preserve and promote the opportunities, for artists and scientific, to explore these technologies and there relationships with mankind. Moving from this Diamond introduced the first presenters.

9:30am – 11:00am
Learning through Machines, Machines that Learn
Michael Gordon, Rowena Goldman, Michael Buro

Michael Gordon, Arthur F. Thurneau Professor of Computer and Information Systems, University of Michigan Business School

Michael Gordon, a professor of computer and information systems at the University of Michigan Business school, in his talk "2 things A.I ish and one that isn't", looked at literature based discovery systems, genetically engineered cars, and business simulations. Thinking of himself as a person who uses A.I, not an A.I scientist, Gordon outlined how he sees using A.I techniques as adaptive techniques, not intelligence techniques.

Working for many years in the area of literature discovery support systems, Gordon outlined how these systems work with breaking literature into their components and analyzing the parts. With this done, the system tries to find new ideas in the source, which could lead to new discoveries. An example that was outlined with this technique was used in migraine headache research. Taking hundreds of articles, broken into words, phases and sentences, the system looked for relationships that possibly have never been made. Ruling out anything that was ever possibly mentioned as a relationship to migraines, the system was successful in finding previously undiscovered relationships.

The second A.I ish system that Gordon worked with was a project that aimed to genetically programming the best car. By using genetic algorithms for recombining generation 1 of the first car with new DNA, new breads of cars were produced. Looking at all genetic crossovers including the mating process between cars, the group was able to genetically engineer the ideal car.
And by using adaptation of ranking algorithms by genetic programming, the group could end with the fastest, most fuel efficient, and most economic car.
This type of algorithm was also used for genetically engineering a search engine.

The last system the Gordon talked about, which is not A.I, was a virtual corporation that his students could work in, populate, and interact in.
Starting with the basis that the company should be really messed up, hairy, and full of difficulties, Gordon put his student through the test in this 15-week classroom simulation. With the prime objectives for the students to fix the company, the students were able to wander the halls, interview employees, look at data, and request more information. As a part of this the students were told that after 15 weeks they still would not have seen everything, so make intelligent decisions.

What was found from this was students could interact with the system in ways that were conducive to their learning that was, infinitely adaptable and could be used in any adaptive situation.

Relating that his project was Majestic on a shoestring budget, Gordon finished his talk with adding that, although there was no A.I. in the system, adaptive computing could be used to make system which could not be beat and wouldn't break down under human scrutiny.

Rowena Goldman, BBC Imagineering

Rowena Goldman, a television producer and development executive at the BBC, presented a new pilot television show set 5 minutes in the future. Stemming from the idea for a television show that focused on the interaction of a virtual character with some form of intelligence with real characters, the detective drama looked at believability versus reality. Looking back at the original base for shooting the mini pilot was to see how it would work out, but more important was to see if the relationship between the characters was believable and engaging. Also as a part of this shoot was to see what audiences see as the prospects and potential of the show?

Starting with a "James Bond" feel and the music of blaring lyrics of "are you human, are you real" we see the main character in his apartment explaining that it all started with a crash of the network system. When the network came on line there were some added features. The main feature was a virtual personal assistant; the "Dig assistant". Installed by his landlord, who allows him to stay at the apartment for allowing him to install web cams, the Dig assistant was an upgrade to the old system. With the "Dig assistants" autonomous nature she can follow her employer anywhere, anytime.

Showing that autonomous characters can be made believable through good scripting, Goldman, went on to some of the goals of the project. Wanting to explore our relationship with machines in many realms, Goldman sees the personal assistant and it potential in other markets beyond the television. With a large potential to port the "ADA" character for PDA devices, some of the feedback Goldman was looking for was to see what the essence of the character is, and what should be ported over.

Finishing her talk with the notion that these characters could potentially increasily learn from the characters that they interact with, Goldman sees a good future with autonomous characters in entertainment and communications.

Michael Buro, Associate Professor Computer Science, University of Alberta

Micheal Buro, an associate professor of computing science at the University of Alberta, in his talk "Machine Learning Games" looked at the role of A.I. in the imitation of human problem solving.

Relating that humans still have a chance in playing against games because they make one move at a time, Buro sees that, with the innovation in hardware and engineering, this ability won't last long. Relating that hardware and engineering

improvements made deep blue possible to beat Kasporoff, we are moving closer to the “the AI challenge” of creating machines en par with human experts or better

Buro goes on to say that the question of how to apply machine learning and heuristic evaluation to the process of games is difficult, because machines don’t know how we play games. This deficit, however, is largely based on the fact that we are still fuzzy in our understanding of how humans think.

Moving on to the question of why use games for A.I. research, Buro outlined some of logic behind this popular field. Working with well-defined rules, perfect vs. imperfect information, and simple rules for arbitrarily complex problems, games deliver a strong base in which to build and test from. Also with having a large human base of experts to test the system, games allow A.I. scientists many opportunities to test their programs.

Going over a brief history of Game AI highlights, Buro, suggested that there are many aspects of game play that still need to be understood. Even with the ability to talk with experts and extract the ‘whys’ of game play, the laborious task would, in most cases, not get us very far. With little knowledge on how we judge positions, determine reasonable moves, and how do we look ahead during games, the process of extracting knowledge from experts is not efficient and would not further our understanding. Machine learning techniques, however, can be used to solve some of these problems. Using learned evaluation functions to evaluate moves and pattern based evaluation for each move in other games, we can get closer to understanding expert logic in games.

Concluding his talk that creating strong AI without understanding every detail is possible and that human problem solving strategies can be mapped to machines, Buro sees machine learning as the key to true A.I. This ability then would free A.I programmers from laborious manual training, and allow the machine to learn, adapt and play.

11:15am – 1:00pm
Organic Lives, Other Than Our Own
Nell Tenhaaf, Christan Jacob, Demetri Terzopoulos

Nell Tenhaaf, Associate Professor, Visual Arts, York University,

Nell Tenhaaf, an electronic media artist and associate professor in Visual Arts at York University, in her talk “Organic lives in non organic matrices” presented a range of artworks that were winners of an A-life competition in Madrid. Not presenting her own work, Tenhaaf focused the talk on a set of A-life works that looked at self-organization and autonomy. With these two features being modeled and studied in A-life research and artworks, Tenhaaf aimed to take a speculative look at our strong tendencies to metaphorize and anthropomorphize these features and the limits these features impose.

Using the terms metaphorizing and anthropomorphizing in a general straightforward way, Tenhaaf's aim was to show how we use metaphor as a means to take the attributes of the familiar to shed some light on the unfamiliar. This way we can attribute what we know to the unfamiliar. Tenhaaf goes on to say that there are, however, problems with these terms. With using anthropomorphizing, which is something we use everyday, we attribute inherent characteristics to objects that are not displayed, and these definitions lead to human centerness. Tenhaaf, continues that in the making of life like artifacts, that the use of metaphorizing is problematic. Iterating that it essentialises the artifact, in that it assigns it characteristics that constitute a type of identity, Tenhaaf when on to say that this practice is prone to becoming fixed to the artifact. Another issue with this is that it tends to uphold anthropocentrism of human centeredness, assuming that the human is the author. These problems are hard to get around considering they are of our making, but there is a way around human centered descriptive systems with the use of assuming a more relational view, which recognizes a type of co-evolution and co-defining entitles. One approach that backs up such an approach, Tenhaaf continues, is semiotics.

Looking at a few different works, Tenhaaf showed how these systems can be used to simulate a social exchange. First looking at the work "Autopoises", Tenhaaf iterated that in the work it looked at the sense of the internal robotic connection that is stronger than the machine human interaction. The second work that was displayed was "Tickle", an autonomous robot that has an elusive characteristic that forces elusiveness around it. Another was "Flow", which showed two merman agents swimming in a pool that people could interact with. With putting their hands in the pool the mermaid would respond with fighting, dancing laughing or other interactions. The last project that Tenhaaf presented was "head", a mechanical baldhead that responds to a human questions, "are you a prophet", but answers with unintelligent answers.

Tenhaaf concluded her talk with the notion that narrative may be a new kind of artifact, a new type of art object, with an expanded social field. And that within that social field it is really crucial that our attention is turned to studying the social nature of that artifact and it's implications.

Christian Jacob, University of Calgary, Computer Science

Christian Jacob, in his talk "A.L. Plants, and Swarms" talked about the use of evolutionary and genetic algorithms. Looking at the art and science of evolutionary and swarm design, Jacob researches how we can use evolutionary computing techniques to try to enhance creativity.

Working from the main idea that evolutionary and genetic programming be used to program a computer without explicitly telling it what to do, Jacob sees a large potential for applications in complex computing.

To introduce this point Jacob showed an evolutionary program called “Ant tracker”. With the simple idea of an ant collecting food in a 2 dimensional maze, Jacob, outlined how evolutionary computing can be used to build complex programmes. Supplying the computer with a defined task and evaluation functions, Jacob was able to breed a program that goes through the maze and picks up all the food pieces. With just supplying the computer with the building blocks, a complex program could be initiated. With the parameters of being able to move, sense its surroundings, such as food, dust, pheromones, and stop, the ant was able to genetically alter its code to get the highest fitness rating. With a set fitness criteria based on the number of food particles picked up, the code generated itself based on its success. With allowing the system to run for many generations, based on improving its fitness, the program eventually generates the code for the ant to collect all the food particles. Using a lot of genetic programming operators such as mutation, crossover, permutation, etc, Jacob was successful in using evolutionary computing to ‘breed’ a program that accomplishes a specific task.

Begging the question of what happens if you just generate a random program, Jacob shows that randomness does not bring about intelligence. But after 16 generations, there is some form of intelligence in the program (i.e. it shows some ability to follow the walls). And looking at later generations, we see at that the program continuously evolves to maximize its fitness and by the 59th generation, we see that the ant can collect all food particles in the maze

Looking at other evolutionary systems, Jacob showed design through evolution and swarm. Developmental programs, such as those to make a flower through using L-system, which can be used to evolve planets, and also through the evolution of blob structures we can create new tools for artists and new ways of computing for the world. Another example used was that of interacting swarms that could mate to form new swarms. “Swarm evolution” as Jacob calls it models the system of characteristics as the generations mature,

Finishing his talk with looking at more examples of how evolutionary computing can be used for both art and science, Jacob showed how math, art, nature, and science can come together to produce vivid, live, colorful, and active programs through the use of evolutionary design and swarm theory.

Demetri Terzopoulos, Computer Science University of Toronto

Demetri Terzopoulos, a professor of Computer Science and Mathematics at NYU’s Courant Institute, in his talk “Artificial Life: Humans and Animals“ looked at what it takes to create realistic human and animal autonomous characters. With the motivation of his work stemming from production animation where characters appear alive, Terzopoulos sees a need for autonomous intelligent characters.

Using characters examples from movies like Buzz Lightyear from Toy Story and the Dinosaurs from Jurassic Park, we see that we can easily suspend disbelief in our interaction with these unlife like characters. Going further, we can still believe and react to these characters even though they are not autonomous and certainly not intelligent. With many animators working together to produce the simple movement, Terzopoulos sees these characters actions and aliveness as a reflection of the animator's skills, rather than intelligence. This knowledge however does not negate the fact that they are affective. Moving on, Terzopoulos focused on photo realistic human characters and their effect. With movies like "Final Fantasy", using photorealistic characters, Terzopoulos sees a need for autonomous characters that can be used separately from the animator.

In his work building autonomous characters, Terzopoulos has created characters that can learn, evaluate and survive in virtual worlds. Looking at many examples from his work, Terzopoulos showed how character evolution from the characters of it's own representation of intelligence, is possible. Showing a character that reacts to stimulus, Terzopoulos showed how an autonomous character could fall, roll over, and balance with gravity. The implications of such a character are that stunt work and character action in video games can now be left to the character, as apposed to the programmer/animator.

Moving from this Terzopoulos, looked at the another example of how autonomous graphical characters", or "artificial animals", could be used to interact in virtual world. With using these interactions we can study predator prey relationships, swarm, and movement. Using an A-Life example of the "underwater world of Jack Cousto", we could see that artificial fish interact naturally with female and male interactions, predator prey relationships, and schooling behavior. These attribute, Terzopoulos, continues are built by the character based on parameters and not hard coded in. So in a way these systems are interacting with, learning from, and living in a virtual environment.

Using "Duffy" the Merman as the example, we see that sophisticated autonomous character interactions can take place in these systems. With watching "Duffy" try to get away from a predator (a shark) we see that Duffy changes strategy to get away. Also using different swimming techniques to get away allowed "Duffy" to continue to survive.

Terzopoulos finished his talk with acknowledging that the game industry is on the ball. With games like "Creatures" and "Dinorex" pushing the envelope of A-Life computing, Film has some catching up to do. Terzopoulos also sees the ability of these characters to form a base in which we can better understand our past, the present and the future.

2:00pm- 3:00pm
Opening of "Mapping our Territories" in the Walter Phillips Gallery

3:00pm – 5:15pm

Are You Human? Modeling Humans--Thinking with and For You: Agent Technologies and Neural Networks
Catherine LaBore, Katherine Isbister, Marina Zurkow and Scott Paterson, Tom Donaldson

Catherine (Kate) LaBore, Creative Director, CARTE, USC

Catherine LaBore, the creative director for the Centre for Advanced Research in Technology for Education at USC"s Information Sciences Institute, looked at terms and definitions, their implications and also at pedagogical agents and social intelligence.

Outlining her thoughts and definitions of terms used in A.I systems, LaBore went through some common buzz words that are used in A.I and some of the misconceptions that come with using such definitions. Starting with the term Agent, LaBore sees robotic agents to be more computational agents. Because the agent part of them is software their core is computational. Also using the term software agents as opposed to a-life agents is problematic in that it assumes that a-life agents are not software. So with these terms now flushed out, LaBore built her own taxonomy of terms and came up with the term A.I agents. Breaking this term into others based on their function, LaBore outlined the different types of A.I agents and their use. Primarily interested in task oriented agents, the range of agents that fall under this broad term include gaming agents, preference tracking agents, truce conversational agents (as opposed to chatter bots), calendar agents, and pedagogical agents.

First looking at their work with calendar agents, LaBore showed "electronic elves" that can be used to set up and coordinate meetings. With the means to contact other elves to reason out schedules, these elves can track, book, and coordinate your whole day. Moving on to pedagogical agents, LaBore showed an array of different agents that are used for training, simulation and education.

With names such as STEVE, ADELE, KARMEN, GINA, and SKIP, these agents cover the range of complexity and skills that pedagogical agents can offer. STEVE, the most sophisticated agent, which stands for Sore Training Expert For Virtual Environments, is used in virtual reality training environments.
A legless agent that floats around the virtual environment, STEVE, is used to show you how to do things in a virtual environment. With simple voice recognition STEVE also has the ability to respond with simple voice commands. With a good understanding of the tasks and the sequence of those tasks, STEVE can tell you why a certain sequence is correct or not correct and how to fix it. Also with a large capacity of specific domain knowledge, STEVE can create a plan, follow a plan, and replan if something goes wrong. The most recent incarnation of Steve is being used by the army mission rehearsal exercise simulation, which is designed to help officers make good decisions in field situations. Funded by the military, STEVE is currently being used for scenario training of Bosnia missions.

Also using agents for Interactive multimedia dramas KARMEN and GINA are used for on-line guided problem solving. As simulation tutors, these agents help students work through simulations.

The latest of the lab is SKIP. Used to help children with multimedia presentations, which are derived from web-based lessons, SKIP promotes learning engagement and motivation. Moving on to social intelligence, LaBore finished her talk with a look at the future of A.I agents.

With social Intelligence from the anthropological view taking precedence, LaBore aims to make agents that work on an anticipatory model that tries to guess what the interaction is going to be and to compensate for it. This task however, is something that will be very hard to achieve and is something that LaBore hopes to accomplish in the near future.

Katherine Isbister, *Interface Agents*

Katherine Isbister, a lecturer at Stanford University and an interactive character designer, talked about social agents, their use, and possibilities. Looking at agents in a social context, Isbister sees agents as a means to influence social interactions.

Looking at examples in the real word, Isbister used “Clippy” from the Microsoft office products as an example. As part of her work in social science, Isbister tries to tear apart why things like “Clippy” don’t live up to their expectations. Analyzing why the paper clip doesn’t work, Isblister found that issues in regard to its antisocial behavior play a major part in its inability to meet the users needs. Issues such as its demanding of user attention and the difficulty associated with trying to get rid of it, Isbister relates that these types of antisocial behavior negatively influences the participant willingness to engage with the agent. Other issues such as user interruption, inability to help with goals, and its unclear social context (i.e. what does a paperclip know about writing letters), are major flaws that hinder agency than promote it.

Coming out of a lab that tries to prove that people treat technology socially, Isbister has researched agents that react and act in social situations. With the goal to see what kinds of new things agents do, the kinds of roles can they play, and how to make them engaging and fun, Isbister has looked at all facets of social interaction and communication.

Touching on examples from her work, Isbister shows that agents can be very useful in social interactions. In her work at Stanford in relation to how people react to technology, Isbister found that people read non-verbal cues from characters and judge those cues the same way they do with real people. The implications of this research is that we have to be very conscious of how facial expression and poise play apart in agent communication.

Working in Japan, Isbister, created an agent for a video conferencing environment. Used to support cross cultural dialog and help to break cultural boundaries, the agent of this conferencing environment helped promote dialog and social interaction. Working with a 'dog' character as the agent, the agent's role was to play the busy cocktail party host, breaking awkward pauses that happen during conversations. With linking student through this system, Isbister found that interactions were longer and in greater detail than would be without the agent.

Moving on to her current work, Isbister talked about the use of customers service agents for business. Based on a menu driven system, taking the best repetitive questions, Isbister created an agent that could interact with customers in a social way that helped them with their questions. With the goal to reduce e-mail volume and customer calls, the agent was to be the first face of customer service. Picking an agent that looks like they could work at the company and be a customer service representative, Isbister, was able to engage customers in their own ability to get answers. The agent reduced e-mail volumes and cut customer service calls in half. This experience, relates Isbister, allows her to see a little ray of hope for the paperclip.

Isbister finished her talk with looking to future of when agents can be used in many contexts to extend and enhance the social experience. With agents being used to promote social interactions, Isbister sees agents as a means to foster communication, friendship and tolerance.

Marina Zurkow and Scott Paterson, *artists*

Marina Zurkow, a polymedia artist whose work is focus on character development and narrative, and Scott Paterson, a freelance architect, talked about their works and some of the future implications of agents.
Zurkow started the talk with a look at her animated shockwave cartoon "Braingirl." Created in response to what she saw the Internet as in late 1999, Zurkow created "Braingirl a type of orphaned Frankenstein who is incredibly smart and incredibly thud headed. Showing two episodes, "Braingirl" we see "Braingirl" as a being just trying to find her place in this crazy world. Moving on to two of the goals of the project, Zurkow related that they aimed to use a lot of the language that are used for interface design and schematics to frame the narrative and to propel it forward. But also to form an aggregate narrative not a linear narrative were users could see growth. With that watching the episodes over time, users could see the narrative aggregate.

Moving on to her work with Scott Paterson they talked about their project "PDPal." Trained as a classical architect, Paterson has working in classic architecture, information architecture, and more recently in mobile devices in trying to uncover the aspects of the virtual within the real. "PDPal" is a combination of character design with virtual and real environments. Existing in

three different layers, “PDPal” works in a plotting layer, which exists on the palm pilots, a computing layer that is a visual web log and a receiving layer, which are the provocations. Implemented as “UPR’s” or Urban Park Ranger’s, their goal is guide you through the city you can discover unknown facts. Also with the ability to write your own experience of the city, the UPR’s could be used as a type of diary. Beamed from 10 different IR agent kiosk set up around Manhattan, your PDA would be able to pick up an UPR agent when you were in range of a kiosk. Termed as “Temporary Personal Urbanisms” the street side kiosks would pick up content as you went along and beam it to your PDA.

With other implications for wireless art, and performance, Paterson and Zurkow look forward to seeing their installation come to life and for future directions with “Braingirl” and PDPal applications.

Tom Donaldson, inventor and artist

Tom Donaldson, an inventor and artist, in his talk “Intelligent Fabrics”, explored the realm of active fabrics and materials. In his talk he explored the notion that through the critical evaluation of what exactly constitutes a smart or not so smart fabric, we could start to reflect on what exactly artificial intelligence is. With the range of work in complex artificial intelligence systems, Donaldson, asks the question, how can a piece of paper or a piece of fabric compete with computational systems? Considering that fabrics and other materials could be used as a means for us to reflect on exactly what intelligence is, Donaldson, focuses on other mechanisms of intelligence outside the computational realm. With leading the audience through a series of conceptual prototypes that are made with smart materials Donaldson, sculpted the logic behind intelligence in fabrics and their applications.

The first conceptual prototype explored was a surgical bandages that Johnson and Johnson produces, used to maintain the right amount of moisture around a wound. With the breath ability and porosity of the fabric as a function of moisture contained within, the fabric displays a type of intelligence. Its ability to act and react in it’s changing environment, in a way that is not predetermined, makes it act in ways that are not inherent to the fabric. This act charges, Donaldson, is intelligence.

The second prototype discussed was a bulletproof vest that is being produced by the army in the United Kingdom. The lightweight vest, which has a negative pleason ratio, becomes denser at the point of contact as opposed to most fabrics that spread out. What this means is that a very light weight material can be used to construct the vest and when struck by a bullet the point of impact becomes denser and intern stops the bullet. This action reaction by the fabric to outside undetermined stimulus, says Donaldson, is also a form of intelligence.

The third conceptual smart material presented was a concept for a fireproof vest. In relation to shape memory metals, as they are heated they regain their original

shape, so to can a vest be made that reacts to temperature. With a lightweight vest, that only becomes dense or impermeable when it needs to, a vest can be made to protect in a smart manner. This action, inherent to the material mentioned, is something that would be very difficult to do computationally

These smart fabrics, for example In relation to the bulletproof vest, can display intelligence that would be very difficult for traditional A.I. The task of tracking a bullet that is fired, to modify in time the properties of the vest, and to make sure the occupant is not harmed, is something that is not in the reach of computational A.I. In the case of smart fabrics where the sensor and actuator are totally integrated as a system, in traditional A.I we see a clear division of the two. And as the fabrics are not separated into their logical and computational components, they can actually gain from the input and completing tasks, allowing then to learn, which again is very hard in traditional A.I. systems.

Ending his talk with wish for all to reclaim intelligence from computation, Donaldson reminded the audience that intelligence is a feature from computation and not visa versa. Stepping back from human intelligence and asking the questions of, not how can we be human like, but what is it that makes us intelligent.

6:30pm – 8:00pm
Writer's Talk and Artist Celebration as part of the Summer Arts Program!
Steve Grand, David Rokeby

The first public forum as a part of the Artificial Stupidity/Artificial Intelligence conference introduced the public to two of the leading innovators in the arts and science of Artificial Intelligence and Artificial Life. Looking at the architecture and interworkings of each persons work, the two presenters aimed to amaze the crowd with the genus that blurs the line between life and robotics.

Steve Grand, Director, Cyberlife Research

Steve Grand, an independent scientist/artist/engineer and the inventor of the best selling A-life computer game "Creatures" covered the fascinating field of Artificial life forms in his talk "Making babies --the hard way". Looking at whole life systems that can grow and develop independently, Grand started his talk by differentiating the different types of A.I and where he fits in the array. Defining Artificial intelligence as "enabling machines to perform tasks that when performed by human beings require intelligence", Grand went on the look at the dangers of such a definition as it relates to our everyday uses of technology. Using the examples of the telephone, pocket calculator, and spell checker as devices that save us from completing tasks that require intelligence, we must be careful to not define the attributes of each as intelligent.
Working from this definition Grand gave the devices that save us as humans from having to use intelligence to solve problems, the Class 1 designation of A.I. in a three class system.

"Special purpose solutions of intelligence." as Steve classifies Class 1 A.I. machines, have many specialized attributes that can make them better than humans in many ways. Using Deep Blue as an example in its ability to play chess, Grand exemplifies that these systems are far from intelligent. And although Deep Blue is very good at playing chess, its ability to adapt is very limited. Citing the use a simple theoretical experiment of putting a rabbit against Deep Blue in a game of intelligence of who could survive if thrown into a fish bowl, Grand showed how intelligence is the ability to adapt to a wide range of stimulus and environments. Intelligence ingrained in general purposes is something that Grand expressed as what makes us intelligent. Therefore, although Deep Blue has the attributes of an intelligent system, it is not intelligent in it's ability to adapt and survive. This ability for survival and to place meaning on situations for adaptation is the basis on which he sees artificial intelligence based on. Going along with Jean Piagets definition of intelligence, Grand sees intelligence as "what you use when you don't know what to do." This definition has many implications, but the most important is the ability to learn and draw from past experiences for adaptation to new situations.

Moving on to Class 2 A.I, which Grand sees as the largest form of A.I. research currently being done, is a general extension of Class 1 A.I. This form of A.I. is based on the assumption that we can breakdown intelligent behaviour into functional modules. Those functional modules can then be implemented in whatever means are necessary to get the job done. With coupling them all together we get some form of intelligent system. This system is the best way that we currently know of, to get working functional systems. And although Grand doesn't not aim to offend, he likes to refer to this type of work as "emulated intelligence" as opposed to artificial intelligence. With the aim for immediate progress, this form of A.I. has payoff, but in the larger scope of innovation, Grand feels that there are other ways to make more significant progress.

Moving on to some of the assumptions of Class 2 A.I. is that we assume that the object of intelligence is the computer. Grand feels that this machine, the computer, is somehow not the right tool for the job. Relating to the intelligence of a couple of example robots, we see that the intelligence of these systems have not evolved, even with processing power growing at an exponential rate.

Reassuring the group that he does not mean to say that computers cannot be intelligent, Grand relates his work in Class 3 A.I as a biological, rather than a computational process. That instead of seeing the computer as a device where we program a specific algorithm to make it perform a task, we can look at the computer as a substitute material. A material that can take more forms than a simple algorithm that is far more interesting. With this type of system as a world were each piece can evolve and interact we can get growth and emergent behaviours. This idea of emergence is part of the core of what artificial intelligence is. The idea of emergence was shown through a demonstration of John Conway's "Game of Life." With showing how the patterns on the game

board brought about emergent behaviour that was not expected nor programmed. This brings Grand back to his idea that machines can be more than the some of their parts.

Coming from a game programmer background Grand, expressed how it is a great medium for experimentation. “Painting by neutrons” Steve used the computer as a medium to explore his interest and knowledge of biological systems, seeing what he could build. Using a Lego set as the analogy Grands experimentation with biological computer systems got out of hand, and with that we have the birth of “Creatures”. “Norns”, as they are called, populate the world of Creatures. These “Norns” are very complex creatures with complete respiratory systems, digestive systems and a brain with about 1000 neurons. Relating to a story of his experimentation with the creatures and their unpredictability, Grand went on to say that with some simple neutrons, and biological computation we can get some very rich behaviours. These behaviours and systems have co-evolved in the complex world Grand created.
With the success of the game many users/fans started trading and breading new forms of the Norns. This evolution of Creatures became the most apparent when Grand received a scientific paper from some students in England that had diagnosed a disease in the Norn population. Moving from this Grand addressed the question of life.

After Creatures was completed people used to ask Grand if he thought “Norns” were alive. His answer is “yes”. With not having a clear definition of what life is, Grand went on to say that there could be a case made that they are an organism, even though they are software and that they are alive. The other question that usually follows “are they conscience?”. And Grand emphatically says “no”. The lack of a mental life, or thinking life, means that they are reacting than thinking. The idea of imagination, mental imagery and thinking must be integral to consciousness.

This thought on consciousness moved Grand to start thinking about the brain, cerebral cortex, and how the brains works, lives and learns. This study of how the brain works led Grand to produce “Lucy”, a baby orang-utan robot that has a complex neural network and the ability to pickup sensory data from many types. Relating that he chose a robot for this new project because of it’s ability to “not bluff physical laws”, Grand sees robots as the new medium for A-Life.
Relating that Lucy is a complex robot that does most of her learning from sensory input, Grand sees Lucy’s senses and brain coevolved. With this he has the beginnings of a living growing entity.

Moving from this Grand finished his talk with what he ultimately wants to accomplish with his current A-Life experiment Lucy. After looking at the complex interactions and physicality of certain actions, Grand concluded that he would have succeeded in his quest in A-Life when Lucy has the ability to play “Patty-Cake”. This contends, Grand, is when all the pieces come together and at that movement he’ll know that she is truly A-life.

David Rokeby, new media artist

David Rokeby, a seasoned new media artist, inventor, innovator, and winner of numerous awards outlined his previous works and how the ideas from previous projects evolved into his work today. Starting with his work "Very Nervous Minds", which was a system that used a rudimentary camera or cameras that observed body movement and translated them into sound in real-time, Rokeby, outlined how the relationship with the computer was something that had innate qualities. This system, through the use of movement in the frame, read the intensity of movement speed, location, and would stimulate algorithms that would stimulate sounds or music that would play in relationship to the movement. Relating that this piece served as an important base in which his current works were inspired, Rokeby, was first inspired through the interaction with this work that something akin to intelligence that is located all over the body. Not all localized in the brain. With this, Rokeby observed that the system appeared to know that you were going to make a movement before you were going to make a movement. Using the analogy of a "quick draw" Rokeby could see that there was a delay between the body preparing itself to move and the conscious decision to make a move. Also that there was a feedback loop of movement, hearing the sound, and acting or reacting to the sound that produced more sounds. With that, Rokeby related that our body intelligence was fed through the loop and fed back to us. Rokeby used these systems as a different way to look at himself and his movements, but also as a visceral experience that encouraged new thinking. Moving on to the one thing he didn't like about the system, Rokeby outlined that he didn't like the fact that actions on movement in the system were limited to sound. And although these movements and the feedback systems were complex, Rokeby saw them as limited. This realization moved Rokeby into his next work "The giver of Names".

"The Giver of Names" is almost an identical piece to "Very Nervous Minds" in that takes in movements from the outside world and responds with sound, but in this piece it responded with words and sentences. With a grammatical engine that chooses words to talk about the object, Rokeby extended the systems range to engage and respond. "The Giver of Names" with a camera pointed at on a pedestal, that when an object is placed on it, analysed its shape, color, texture, and outline,"The Giver of Names" could use this information to stimulate a knowledge base. This knowledge base has about 100,000 words and ideas that are cross-referenced to their stimulus based on the objects properties. This stimulus brought about a type of "state of mind" were the system showed different degrees of stimulus based on the properties of the object. One of the most interesting things that Roceby found from this piece is how he projected meaning onto the objects based on what the computer said.

Moving from this Rokeby related some of his experiences with building these systems. Finding that writing visual processing code as a very humbling experience, Rokeby related that there are a lot of things that we take for granted in our own processes that are very difficult to program in a computer. With a

number of processes that we do automatically, Rokeby could appreciate how hard it is to build a-life systems. Pointing out that the speech recognition was not programmed for each object in the system, (i.e. when you see this shape do this) Rokeby outlined that the computer processed it's own words and sentences, based on it's interpretation of the object. Concluding on this piece Rokeby found from this installation, in hanging out with it, that you start to notice consistent mistakes that it makes and after awhile it seems to form it's own type of alien dialect. This dialect, charges Rokeby, anthropolymorphized a type of loneliness on the system, and thought that it would be interesting to make a community of these things. This idea of making a community of these systems became "Enchant"

"Enchant" was a similar system to "The Giver of Names" but was a bunch of systems in a community. With the ability to stimulate and relate to each other's stimulus, Rokeby looked for commonality amongst the chaos. Part of the projected problem with this system is whether the system would have to be forced to chant in unison through code or whether the chat would emerge. Working from this problem, Rokeby found, to his surprise and delight that the dynamics of chant arise from the system itself. This discovery, very satisfying for Rokeby, showed a type of group dynamics in the system. Going on from "Enchant" Rokeby showed his latest work "Steamingmedia.org"

A bunch of saunas linked via the Internet all over the world served as the base for Steamingmedia.org. Being a custom in many cultures to discuss, and relate in this type of environment, Rokeby built a system with microphones, a camera, and Internet connection to link these many saunas around the world. As an installation to promote community, Rokeby finished his talk with looking at the future when everyone would have a "Steamingmedia.org" sauna in there home, to connect, communicate, and participate in a world community.

Saturday, August 3rd

9:00am –9:30 am
Recap of the day
Sara Dimond

In the summary of the days events Sara Diamond touched on some of the main issues that were raised during the previous days talks. One of the main issues was the use of language in how the participants communicated their points of view. The need for 'definition' was one of the main points that Diamond made during the summary. Also made clear during the overview, was the need to talk about methodologies. As most people use different methodologies and practices in their work there is need to explain these practices, as they are not always obvious or apparent to the other individuals. The second issue touched on was whether people should be quoting precedence of were the work came from and were it fits in the larger picture. This point however, says Diamond, is not something that has to be done as this is a free flow of information and pretextual knowledge of were it fits could be brought up over conversation.

Moving on to the previous nights events, Diamond commented on the discussion about David Rokeby's work, which brought together some of the problems that a lot of people are working on, the problem of chaos. In Rokeby's "intelligent/experimental " system there is a pushing of the boundaries of language. Looking at people's comments from the work, people found the instillation somewhat disturbing in that the chanting was familiar but the words/chants were chaotic. With the machines falling into a unison chat that was somewhat semantic, Diamond related that this was somewhat disturbing in that it seemed that the machine were communicating. The movement into and out of chaos had the participants looking for other types of structures that are poignant.

Moving on to Grands work, Diamond outlined how his work and the degrees of computability and invention within the realm of A.L. was inspiring. Working with the biological systems, as opposed to imaginary silicon senses, Diamond sees Grands work as pushing A.I and A.L into a new realms.

Also addressed in the summary were issues of realism, predictability, and computational functionalism, and how do we define A.I, and autonomous systems. Whether it's about the evolution of the systems or that these systems there to help us, Diamond asks the question of "Is the human goal to create these ideal systems that don't follow the rules of evolution"?

Moving from this Diamond outlined some of the discussion of the importance of the player in games. With the ability of A.I to both support and challenge the user to make the games more engaging the players role in games is evolving. With also allowing the player feel that they are in control, with the player as actor,

participant, spectator and the game designer as director, Diamond views A.I in these systems as an improvisation of the player/game fit.

Diamond finished the summary with the issue of social agency and intelligence. With agents being socially adept, Diamond outlined how we want a kind of reflection of ourselves in how agents behave as characters. In reaction to this we also have to look at issues of the trust of the agent and ethics that surround the agency of autonomous characters and how far this can go. In concluding this summary Diamond introduced the morning speakers.

9:30am – 11:30am
Intelligent Games, People, Machines, —Playing By Whose Rules?
Jonathan Schaeffer, Celia Pearce, Eddo Stern, John W. Buchanan

Jonathan Schaeffer, University of Alberta, Computer Science

Jonathan Schaeffer, a professor of Computing Science at the University of Alberta, talked about the history and future of A.I in games in his talk “Games and the New AI.” Beginning his talk with the question of “why use Games as the experimental test bed for A.I”, Schaeffer outlined some of the main points of this method.

Outlining that games as a framework for A.I., allows researchers some unique opportunities to test and play with aspects of their A.I systems, Schaeffer related that the capabilities to test A.I. in real time in these environments as one of the most important. Also having an integrated test bed were many aspects of A.I. can be tested allows the researcher to test their systems in a structured rule based environment. Also with the ability for the researcher to compete or engage with human players, makes games a fun aspect of the work.

Looking at some of the applications of A.I. in games such as poker, go, checkers and chess, Schaeffer attributes the success of these systems to the computer. Viewing both man and the computer as machine, Schaeffer outlines that both, as machines, have unique strengths and weaknesses. Exploiting the strengths of the computer for its abilities as a fast repeater, large memory capabilities, and precise numerical calculations, makes the computer a very useful tool for A.I. Illustrating these points with a few examples Schaeffer moved into some of the past discoveries and research in A.I.

Putting some perspective of the Kasparov and Deep Blue match, Schaeffer started with a weight in sheet. Looking at the advantages and disadvantages of each, we see that although Kasprov had some advantages over Deep Blue, the strengths of Deep Blue in its ability for computation over came Kasporvs weaknesses. Other examples of what has been done, is Micheal Buros Othello game that beat the world champion. Looking at the knowledge of the Othello game, the A.I. discovered patterns and toned this knowledge to its advantage. With playing itself to gain these parameters to the tune of over 1 million

parameters, the system is better and more knowledgeable than any player. The problem with this however, is that no one understands the knowledge. Another example of using the technology to overcome a game is the use of a computer to solve crossword puzzles. Using Micheal Litmans work with the program "proverbs", using multiple agents he found that 34% of clues/answers in most crossword puzzles are repeats. With this knowledge Litman found that his system could score 1/3 correct on most puzzles without any work. "Proverb", on the other hand, can score 95% on the New York Times puzzles without understanding the clues.

Looked at the past blunders of A.I. are games we have learned a different way of thinking form the computer. That non-human ways of playing as just as effective as human player. Humans have learner a lot by watching these computers play games. Different styles, new techniques and new knowledge.

So with looking at the past we look at challenges to overcome. With focusing on beating the best players in the world, in real time, and combining science and engineering to build high performance systems, one of the biggest accomplishments is seeing how hard it is to build intelligent systems that are in par with humans.

Moving on to the mainstream applications of this technology, Schaefer outlined how the algorithms in games are being used in many other applications. From DNA sequencing to air traffic scheduling to theorem proving, the A.I. and logic from game can and is relevant in many other fields.

Reflecting on to the NEW A.I, Schaefer views the old board and card games as history. Seeing opportunity in the commercial games industry to explore A.I. and its application, Schaeffer has had to change his way of thinking about game A.I. With the new paradigm to help, understand, and augment player, instead of beating them, the new A.I. looks to adapt and match the player and their abilities.

Finishing his talk with the "Holy grail of game AI", Schaeffer sees the panacea of the game industry as the creation of realistic characters with believable behaviours that are non-repetitive and able to adapt and learn. With that small order, Schaeffer sees an exciting road to follow.

John W. Buchanan, Director, Advanced Technology, Electronic Arts, Canada

John W. Buchanan, Director of Advanced technology for Electronic Arts Canada, in his talk "A.I in videogames", started with outlining the "true" dynamics of video games; coke and pizza. Contrasting the development of A.I in games, Buchanan showed EA's NHL products as they have matured on three different platforms and in three different time periods; Super Nintendo (1995), Sony Playstation 1(1998), and the Sony Playstation 2 (2000). Even with the vast developments in the field since, many of the die-hard players still feel that the A.I. in NHL 95 for

the Super Nintendo is the best; keeping their systems for that specific reason. Moving from the snap shots of each product Buchanan, instead of talking about what A.I is, relayed what A.I is specifically in the development of sports games. Looking at attributes such as interaction with the user, animation drivers, bot drivers, and database query engine, Buchanan sees A.I. as the most abused term in the games industry. With no definition for A.I in the industry, Buchanan says that many times anything that looks to be intelligent is attributed with intelligence.

Moving to the "The Turing Test", were A.I is based on whether a human can distinguish a computer from a person, Buchanan sees many flaws in this test in specific to games, in that it doesn't take into account the suspension of disbelief. Making analogies on how we suspend our disbelief in movies and games, Buchanan sees how these phenomena can greatly affect something like the Turing test. Using the analogy of using duct tape and bailing twine to software engineer A.I in the past, the games industry used to do whatever it took to get the game produced, workable and out. With looking specifically at A.I, Buchanan, outlined that only approximately 5% was allotted to A.I. in past game development cycles. This trend, however, has changed with the advent of faster processors, smarter players, and an expanding industry.

Contrasting traditional A.I, which aimed to beat people, vs. game A.I, which works with the person to engage play, Buchanan suspects that some games today could easily pass the Turing test based on people suspension of disbelief. Moving on to A.I. in sports games, Buchanan outlined some of the different types of A.I. employed. Using multileveled A.I in these systems the A.I system works on many levels to help the player make decisions on one end and challenge the user at the other. Player tactics, team tactics, and season tactics are a few levels that are included in many sports games.

Moving on to "first person shooter" games, Buchanan sees a big problem with these games in their lack of adaptability. With having to explicitly tell the computer our level of ability, before we play, there is no way to compensate for the players down falls or abilities in the game. Having games that don't adapt to how we play and work, does not produce the ultimate gaming experience. This playability factor, along with the ability to make characters in these games more realistic, engaging, and exciting, Buchanan feels, is one of the main reasons for the development of A.I. in games.

Finishing his talk with the notion that most game A.I today is based on animations that are included in the games, Buchanan sees this method as limited. With the ability to program these games to think ahead, strategize and to analyze player's ability to adapt to their play, the game itself can support and enhance it's own playability.

Celia Pearce, Researcher, UC Irvine

Celia Pearce, in her talk “Artificial Imagination: Smart Games for creative players”, looked at her interest in creating games from synthetic worlds. Relating that her interest stemmed from her fascination with reading fantasy fiction, Pearce, found inspiration from Alice and Wonderland and Mary Poppins. Using the analogy of how Mary Poppins allowed people to walk into their chalk drawing, Pearce relates that she sees her work as very similar with her creations of virtual spaces.

Working 10 years in the theme park industry, Pearce showed examples of how technology could be used to immerse the player in the experience of the game. Using cooperative game play, Pearce experiments in influencing how people engaged themselves in games taking on virtual roles. Moving on to her 1997 “The Interactive book”, Pearce talked about her philosophies of game design. Taking off from Marshal Mculans ideas on media as an extension of man, Pearce sees media as a means to extend our physical and cognitive capabilities. The idea of intellectual prosthesis, about augmenting the human mind, is something that Pearce sees as the power of the computer. Rather than using computers to simulate intelligence, Pearce sees us using them to supplement, augment and extend our human intelligence and creativity. Relating this to A.I. Pearce sees A.I. as more about augmenting what humans are good at.

Also interested in procedural and emergent narrative, Pearce talked about procedural narrative as a rule based story system and emergence as the resulting process that happens out of procedural narrative. Relating that in emergent systems stories can be anticipated, but not predicted, Pearce sees a future were these can become infinitely more interesting when married with A.I. Looking at emergent authorship – were the players act in the production of the narrative, the player takes and active, creative, nontrivial role. Moving from consumer to producer, Pearce sees the discourse between the players and designers blurring in that play that was not expected will emerge.

Using the quote “The author is dead, long live the player” one of the things that is interesting in the games industry, is the element of hacking that has lead itself into the game realm. Hacking in itself is a game. With contempery procedural based games is that integrating “hacking” and “moding” play patterns, at various levels of the game. In some cases they are a part of the game play, in others its just creating infrastructure to support low level hacking. We see a scale of hardcore hacking with lesser play models at the other end. Defining “Moding” as the modifying of a game to create new levels, worlds, texturing, changing characters or objects, and in some times making a whole new game. One of the best examples, Pearce continues, is “Counter strike” which was build using the “Half Life” engine. Becoming the most popular first person shooter mod on the web, Pearce sees the ability to mod or hack games as a means for the industry to grow and develop. Winning the best game developed rookie studio, Pearce finds it interesting that a game mod could become more popular than the game it’s based on. This phenomena, says Pearce, is something she thinks we’ll see more of.

Moving on to MMORPGS's, and MOO's, Pearce outlined the evolution of books like the "lord of the rings" and D and D into these new worlds. Relating to the godfather of MMORPHS "Active worlds" is the oldest actively working 3d virtual world, Pearce sees the potential of these worlds as great. With 200,000 registered users, and 100's of user-based worlds, many are taking life into a new dimension. Relating to this notion of moving into these worlds, Pearce talked about an actual wedding that took place in one of these virtual environments between people who met there.

Finishing her talk with looking at the evolution of these worlds, Pearce outlined the emergent economics that have come from these games. With people selling their characters on ebay etc, there are many facets of these worlds that were neither expected nor anticipated. These unexpected evolutionary movements, Pearce contends, will continue into unknown realms as these worlds mature.

Eddo Stern, Artist

Eddo Stern, an artist and inventor, started his talk with responding with some scepticism in relation to the command and control model for MMORPG based games. Seeing the progression of producers to a monopoly, where it is very hard to compete with the companies like Sony, Nintendo, etc that make the games, Stern believes that these communities will always be influenced by companies and advertising. Relating that It's one thing to let people participate as a community in a virtual world, Stern sees these worlds being controlled by the manufacture.

Showing his work in the area of 'mods' and 'bots' used in games and MMOPRG's, Stern, outlined how experimentation and performance in the use of these entitles was a new form and area of art. Starting by showing a project that started in 1999, Stern related that this joke, spoof or experiment, was trying to embed sci fi and high tec into medieval games. With making 'bots' that mixed the two genres, Stern released these 'bots' in MMORPG's worlds. This fascination with bots allowed Stern to automate many tasks that are repetitious in these environments. Having developed many 'bots' that would take over for him when he wasn't playing, Stern found these bots to be quite efficient and also very entertaining in their application. Developing some very simple bots to do silly things, like just stand at the entrance to a door, watchers, and pretender bots that would mimic non-player characters, Stern found that many live players would fail the Turing test in some interactions. One such example of these joke 'bots' was a crawler bot, that Stern developed, how lived for 6 months on the Everquest site, walking around and spewing out quests to draw attention. Relating that most of his projects are parasites in MMORPGS, Stern sees using his characters as a means for public performance; using these spaces to perform and enrich the experience.

Moving on to his “Summons to Surrender” a spoof site, Stern related more of his work. “Tekken Torture Tournament” is one such experimental work. With hooking up participants to electrodes during the match, the participant could really participate in the pain of the tournament. Having done the instillation in L.A, the tournament is now slotted to tour the U.S. due to its popularity.

Stern finished his talk with the point that the fun of these games is in taking them from the backend and making them his own. Developing many more characters for people to interact with in these virtual worlds, both weird and wonderful, makes these virtual worlds a little bit more like the real.

11:45am – 12:45pm
As We Go Marching, Marching, Robots And Performance
Adrianne Wortzel, Christopher P. Csikszentmihalyi

Adrianne Wortzel, Associate Professor of Advertising Design and Graphics Arts, New York Technical University

Adrianne Wortzel, an associate professor of Advertising and Design and Graphic arts at New York City Technical College, talked about her work Camouflage Town. Exhibited and commissioned by the Whitney Museum of Art, as a part of the Data Dynamics exhibition, the work dealt with data transmission, the Internet, and interactive avatars. Contributing to the exhibit an interactive avatar robot named “Quru”, the robot roamed the museum interacting with both on-line and physically present visitors.

Working with a crew of 15 in a variety of areas including server side scripting, video conferencing, audio engineering, robots, and costume design, Worzel and the crew, as a collaborative team, worked together to make the project come alive. With each specialist contributing their expertise in a special area, but also with the ability to explore and learn in other areas, it was a true collaborative team effort.

Wortzel, who’s own impetuses to moving into robotics stemmed from her nostalgia for soft avatars and moo’s, worked as the producer of the Camouflage town project. Remembering the first iteration of avatars in cyberspace, the disembodiment and adventure of being someone or something other than herself, and interacting with others in the same space and experience, compelled Wortzel to develop robotic avatars.

The basis of the project was Camouflage Town, the robots virtual hometown. Serving as a decoy town, which was used to perform military maneuvers for war, this virtual narrative allowed the robot and public to intact in a contextual framed world. Roaming around the museum, speaking, avoiding obstacles with collision detection, and transmit images to the web, the robot gave a true autonomous feel.

The web interface of this project showed one of two video streams to those who tuned in. Alternating between what the robot sees and six surveillance cameras, the user was given a full range of experience in the robots interactions. When in control of the robot, the user had two minutes in which they could control the robots locomotion, camera, and speech. Already programmed with a database of 53 philosophical speeches about camouflage town, its origins, fables, and system of beliefs, the robot interjected snippets of information to the public and on-line viewers.

These snippets, Worzel relayed, had an interesting effect on the human culture of the museum. With having the robots presence around the museum for the period of time, the staff started speaking some of the Camouflage town statements, and actually missed its presence when it was removed.

Ending the talk with more questions as to the role of rich narrative in story telling and A.I. applications to virtual worlds, Worzel showed how inatomate systems could affect how we interpret A.I. and human/avatar interactions.

Christopher P. Csikszentmihalyi, MIT Media Lab

Christopher P. Csikszentmihalyi, the Fukutake assistant professor of media Arts and Science at the MIT Media Lab, talked about his work in cultural computing. Reminiscing about his early work as a student at the Art institute in Chicago, Csikszentmihalyi, relayed how the security guards loved his work more than anyone, because of their virtual presence. Having done work with robotics and in the history of science, Csikszentmihalyi's work follows history and social context in a way that addresses social issues through the use of technology.

First looking at the war in Slovenia succeeding from Yugoslavia in early 1991, 92, Csikszentmihalyi became curious about what anyone was going to do about this war, in particular in the area of peace. With a large part of money going to technology for war, Csikszentmihalyi wondered why there was no money going into technologies for peace making. So, with that idea, Csikszentmihalyi decided to develop something that could help the war in Yugoslavia. Developing a robot with multiple auditory sensory inputs, Csikszentmihalyi, developed a robot that would listen for gunshots or other noise, analyse the noise, and if it was infact a gunshot, would fire back with an integrated cannon. Using the eye for an eye methodology, Csikszentmihalyi found that his robot made many people nervous in its gallery showings. After seeing a similar system in the free enterprise system, Csikszentmihalyi realized that working in future technologies, there wasn't anything that he could produce that would see some type of market in a free enterprise system. This lead Csikszentmihalyi to look at society and technologies effect and affect in how we interpret ourselves and the world around us.

After seeing an art piece in Estonia, Csikszentmihalyi, became interested in facial display of affect. Tying back to Darwin, the expression of emotional in man and

animals, was a long time fascination for many scientists and technologists. Moving from this Csikszentmihalyi outlined a machine from the 50's called a "Perceptron", which could, upon seeing a picture of a face, distinguish whether it was a male or female. This machine however, was dropped from the scientific community after book by Minski and Pappert falsely said that Perceptrons couldn't solve simple problems. This book however and its information didn't reach Illia Procopov, a Russian scientist working on Perceptrons. So for the next 20 years Illia Procopov continued to develop Perceptrons and developed one that was quite powerful. Being able to distinguish male from female, Procopov found that some persons analysed with the system showed a small bump in their analog output. Procopov, digging further into this found out that the bump was only there for members of the communist party.

Interested in trying to recreate this, Csikszentmihalyi built and installation of a fictional Perceptron and hired Polish actors to make the instillation more believable. Throwing people into the chair, scanning their face and reading the output to the person in the chair, people believed the Perceptron to be a real instrument. Having no idea of what's going on or what's being output, Csikszentmihalyi found it interesting that no matter what they said to people, they tried to fit their personality around the output. Moving from this Csikszentmihalyi outlined other fascinating science instruments of fiction.

Csikszentmihalyi finished his talk with a look at his most recent project, a robot war journalist. Stemming from his concern after September 11th, the robot with multiple sensory inputs, that could get past pentagon press censorship, would and roll around war torn countries and talk to people about relevant issues. Pickup by the New York Times, Csikszentmihalyi fuelled the rumour that this was real, spurring further controversy. Now trying to bring this rumour to life, Csikszentmihalyi aims to push the envelope of what's real and what's make believe.

1:45pm – 3:30pm

Conversation Systems, Smart and Stupid Language Analysis and Data Mining

Randy Goebel, Sheelagh Carpendale, Sara Diamond Richard Lachman and CodeZebra Team

Randy Goebel, Computing Science, University of Alberta

Randy Goebel, a professor and chair in the Department of Computing Science at the University of Alberta, talked about the limits and points of view that contribute to and influence A.I. Relating that he sees computing as the modern physics, Goebel expressed that there are many views of A.I. that stretch the limits of what can and cannot be accomplished.

Understanding that the world is made up of things we cannot see, Goebel sees the world as information. With information as the source of everything, it is then

the job of the computer scientist to capture that information, store it and manipulate it. There is, however, a danger with our understanding of computer scientists in relation to other types of scientists. As a foundational scientist, Goebel sees computer scientists as those who can take a range of ideas /methodologies in the sciences and build applications that serve all. This allows the computing scientist to play with information in many disciplines and many fields.

Moving from this Goebel goes on to say that he does not think that the idea that information is everything takes away from what we already know. Granularity, and abstraction of information and the fact that we can compile it into a meshed neural network does not mean that there isn't information used and deployed in doing that. Geobel, continues, that A.I is about knowledge representation and reasoning of what we know.

Moving on to the limits of computing and what can be automated, Goebel expresses his belief, that you cannot be a computer scientist if you do not know the boundaries of computing. Seeing this as an important computational concept, Goebel, believes this concept determines how efficient we can be in our computations.

Go over some ideas of A.I that are instrumental, Geobel sees physical symbol systems and knowledge representation hypothesis as fundamental to A.I. These are reflected in that we can capture knowledge; we can deploy it, and use it. Moving with the adage that "keeping it that simple is hard but that's all there is to it", Goebel moved on to the debate of A.I vs. H.C.I.

Addressing the issue if A.I. is actually just H.C.I (Human Computer Interaction), Goebel relates that it can be looked at that way, however, A.I. has to be about something that we understand as humans, just as we ask questions in all the sciences. Having to articulate our scientific finding in such a way that humans understand, we automate processes to try to understand the process.
The issue about where A.I. is just HCI, Goebel contends, is addressed through the fact that most A.I. researchers are not interested or researching in systems that think like us. Cognitive scientists do this, to understand us as information processors, but it is important to know how these systems work.

Geobel concluded that A.I.scientists have to adopt representational reasoning to understand future directions and that we have only scratched the surface of the possibilities of computing and A.I.

Sheelagh Carpendale, Computing Science**,** University of Calgary

Sheelagh Carpendale, an assistant professor at the University of Calgary, talked about her work in visualization and how it relates to externalization. With the idea that some of our intelligence is based on how we interact and use it as a tool in the real world, Carpendale sees her work in visualization as about creating

different types of tools. These tools then can be used as a different means to interact in the real world.

Talking about the notion of visualizing human dialog, Carpendale, relates that this serves, as a bit of a problem in the ways computers understand language. Relating that computers don't really understand anything about dialog, so how are they going to visualize it, Carpendale outlines some of the logic behind her work. With dealing with the complexities of how systems were going to deal with this is an intelligent way, Carpendale and her team decided they didn't need computer intelligence to visualize the dialog. Dealing with the data directly, in particular chat data, they could use simple techniques to display the data in an aesthetically pleasing visual form. Using the analogy of a cocktail party were everyone's talking, and you can focus on different elements of the general noise, Carpendale relates how we can use visualization to see this general overall interaction with the ability to focus on one or many.

With trying to include emotional aspects of the visuals with the interactions, Carpendale outlined some of her work with visual chat systems.

Starting with an explicit input system, like a cartoon chat, the user can explicitly tell the character the emotion to display. This way the user was able to explicitly express their characters feeling by changing the characters facial expression. This way, the visual aspects of how the person was feeling could be expressed. Moving from the explicit Carpendale outlined some of her work in subtle interactions. "Chat circles" is one such program. A program that allows the user to type into circles that enlarged as the person typed in them, Carpendale sees many subtle interactions that could be used for communication. With only having the ability to read the circles that you're close to, the system aims to situate the user in a contextual space. Another way that Carpendale sees these subtle interactions taking place in these spaces is through the recognition of someone's typing. With the ability to see the circles grow as a person types, it is possible to recognise who is on-line without even reading the text.

Carpendale concluded that these types of systems could be used to model chat and user interactions in ways that would be very difficult any other way. And that these systems support human interaction in a meaningful way that promotes dialog.

Sara Diamond, Richard Lachman and the CodeZebra Team

Banff New Media Institute leader Sara Diamond and Richard Lachman presented the utopian vision of art/science in the chat visualization software prototype "Code Zebra" (CZ). Explained by Diamond, CZ was a software project that attempted to facilitate and represent debate and chat between artists and scientists, mapping the emotional tone and theoretical direction of each post. CZ as Diamond continues, could also be used in a broadcast environment where participant chat is mapped and analysed. Diamond described Code Zebra as

composed of a pattern matching system based on the zebra, ocelot, cheetah, giraffe, snake and others that were grafted onto likeminded participants in the chat. Striped and ready for action, participants in the chat would be able to form an identity and a history in negotiation with the language of their character. Presented through a number of language games, participant's language and history were displayed in a 3D moniker. With this type of recognition, it was hoped that artists and scientists would literally blend each other's patterns, sharing each other's stripes.

Using the analogy of the cocktail party, participants could engage in a single conversation but also string off and join other conversations. The participant could also choose to join a conversation after they have understood the emotional dynamics of the conversation. The dynamic ability to push like conversations, sub topic conversations, and like ideas to other areas allows the environment to adapt to the emotion and topics of the space. With the participant able to pull topics and interests towards them, they can position themselves in the space and see where they are situated in the encompassing world.

Diamond, who hoped to create a context where art and science could congeal, also looked beyond the interface with project extensions consisting of a dance performance/club night, which took place at C3 in Budapest (November of 2001) In trying to understand how patterns can be meaningful to humans, the CZ team saw that self in relation to the conversation could be reflected in a pattern. Allowing the participants to develop a series of patters based on your conversation that represent you, each person would have their own CZ fingerprint.

Lachman continued the demonstration of CZ with outlining how they look to extend the text analysis, chat analysis, and add on modules to CZ that will aid in the analysis chat and user interaction.
The team finish their talk with encouraging the participants to join in the code zebra environment to experience the mesh of the visual, emotional, and virtual chat environment.

6:30pm – 8:00pm
Games Night! Public Discussion Of Popular Games And How Characters And Intelligence Work In These. Followed by Games, by XBOX
Ralph Guggenheim, Steve Boxer, Zack Simpson, Mirjam Eladhari, XBox Representatives

Sara Diamond kicked off the final public forum on Artificial Stupidity / Artificial Intelligence by outlining some of the main topics that were discussed over the past three days. How we understand our own intelligence, logic, and the importance of machines roles in our exploration of these topics, were discussed. With video games playing a major role in this exploration, Diamond saw that it as fitting that the conference end in a public forum with a discussion of popular games and how characters and intelligence work in these environments. With a

diverse panel of professionals from different fields, the discussion began with the questions of; what is your favorite game and why?

Starting the forum, Ralph Guggenheim, an independent producer, who has worked in feature films and video game narrative, including the highly popular immersive game Majestic, outlined that he sees the convergence of mediums as the innovation that allows for immersive experiences. With the blending of film, art, and game play into these environments, games offer a whole new world of exploration. Moving on to the question of what his favorite game was, Guggenheim related his interest, as of late, is with Grand theft Auto 3. The extent of the immersive nature of the game and its open world experience, Guggenheim relates, puts it in a league of it's own. With most games putting the player through a series of steps in a linear fashion, Grant theft auto 3, allows the player to create their own narrative. This open narrative, in his opinion, represents a new generation and style of game play.

Steve Boxer, a freelance journalist, who writes Edge magazine, continued the conversation with his choice of Tetris as his all time favorite game. Commenting that current gaming is too focused on the flash of game design, Boxer sees that there is something to be said for good game play. With many developers losing focus of what makes people return, good old fashioned game play, Boxer hopes to see more development in the areas of solid game design and user experience.

Commenting next on the panel, Zack Simpson, an artist and researcher, who in his spare time, programs the back engines for games, also chose Grand Theft Auto 3 as one of his favorite games. With the open world architecture of the game environment and its open narrative, Simpson sees this as an improvement in the gaming world. Also with the possibilities for endless narratives, Simpson sees the role of A.I. in these types of games as the mesh that holds the user in the experience.

The last to speak on the panel was Mirjam Eladhari, with the zero games studio in Sweden. Relating her fascination with open-ended game worlds, Eladhari sees games like SimCity and Civilization that allows the user to build vast worlds, as the future of gaming. Having spent a lot of time in these game spaces, Eladhari would like to see more development in this direction.

Thanking the group for their participation, Diamond opened the forum with inviting all participants to participate in the discussions and debates that surround games and to enjoy themselves in game play with the array of computers and XBOX consoles that surrounded the room.

Sunday, August 4th: Research Day

10:00am – 12:00pm
Review Of Key Ideas, Key Research Questions, Project Ideas

Lead by Sara Diamond, the group came together to debrief on the conference, its highlights and future directions. With a strong emphasis of future discussions, collaborations, and topics of exploration, the review served as a good base on which people could meet and discuss the three day event.

Outlining that social scripting, narrative, character rich environments, MMORPG's, social behavior in games, HCI and data visualization, and complex emergent systems, as the main topics of special interest at the conference, Diamond encouraged the group to contribute their thoughts.
A rich discussion of the participants ensued about these topics and specific areas were addressed for further discussion in break out groups. This allowed the participants to engage in more in-depth conversations on specific topics.

Ending the conference with accolades for the participants, Diamond encouraged everyone to continue the debates and dialogs that stemmed from the event and to continue pushing the envelope in the possibilities of artificial intelligence / artificial stupidity.