Sheldon Pacotti, Ex-Deus Ex Author Sheldon Pacotti, Ex-Deus Ex Author Massive Reactions In Cell : Emergence

Sheldon Pacotti, principal writer for the original Deus Ex and its sequel, Invisible War, leads a quietly explosive life. He teaches game writing at the University of Texas, is a software architect at a business design, marketing and consulting firm called frog (capitalization is apparently out this year), and he recently founded New Life Interactive, which this year released Cell: emergence.

Cell is a tricky beast to peg down, fusing voxel-based, strategic gameplay with mechanics that appear to be AI-driven, but are in fact "cellular automata," or the direct result of each player's organic style -- and all of this taking place inside the body of a sick child.

This all may sound vague or convoluted (or both), so we'll let Pacotti fill in the remaining details on Cell and his influence on Deus Ex: Human Revolution -- though we can't promise you'll understand his terms any better, we do believe you'll feel intellectually enlightened regardless:

In your game mechanics video, you describe Cell: emergence as "massively reactive," and say that this type of fluid, detailed gameplay will be the next step for developers after perfecting photorealism in graphics. Explain that process a little further, and how you think it would change the way we play or the types of games that are made.

We're on the verge of having excess computing power in 3D games, which will multiply the opportunities for innovation. Of course, the same exact thing was said when the last generation of consoles arrived, so I may still be a generation off, but I think you can already see new forms of gameplay emerging from the application of excess computing power to game state rather than visuals. World of Goo's chain reactions and rubbery constructions proceed from excess computing power available to 2D PC games -- and offer what I think players are hungry for: a new type of game to play.

Cell is an extreme design exercise in this vein: a game created from a world in which every speck of color has game-state and is interactive. It has a very different feel than games built from collision cylinders that contain lovely polygonal models. Things grow up around you, bleed into each other, melt away... and I think this freaks out most players. The walls have come alive, and they have bleeding faces in them.

I don't see established genres being replaced by these "massively reactive" mechanics, but I do envision space battles in which armor melts away one voxel at a time, nebulae swirl and asteroids crumble. And first-person shooters with mud, sticky foam, smoke, self-replicating slime molds, etc. There's no guarantee that any of these elements will be "fun," but the door is opening to try them out. MINECRAFT SERVERS

Many players may initially say Cell: emergence is a simple game, just from seeing the

graphics alone. How complicated are the mechanics behind the exploding cubes?

One thing that surprises me is that the game has been touted as having "well-built AI," when in fact it has no AI. I guess that's the ultimate "emergence," seemingly intelligent behavior resulting from tens of thousands of calculations per timestep. In truth, I had to restrain much of the cell-cell emergent behavior in order to put players in control of the gameplay. But a strange sort of life does emerge just from the raw quantity of calculations.

To understand this in pure geek terms, consider that the game has almost a million cells and about 10 cellular automata rules, which reference at least 6 neighbors for each cell... creating a simulation that, unoptimized, would require around 50,000,000 operations per timestep, but which nonetheless manages to run at arcade speeds. So the engine is "update bound" rather than "render bound." It optimizes how much game state can be crunched every timestep rather than the visuals.

The kind of gameworld I'd like to build, as we move from the DirectX 9 tech of Cell to the GPGPU, has no culling, at least for game objects: Every rock and every drop of water, if truly a part of the gameplay, should persist when they are not in view. Maybe that's designing software for a Star Trek computer, but this is the kind of simulation we can imagine in a world of excess computing power.

Do you see opportunities for Cell: emergence to be a learning tool for medical students, or is the cell aspect simply a clever veneer for the star of the game, its mechanics?

I'll be the first to admit that Cell is closer to science fiction than to science fact, and I think that anything of practical scientific value would need to reach beyond the mathematics of cellular automata. But I did want to provide a clear context for the gameplay -- "meaningful play" to channel Salen and Zimmerman. So the cut scenes remind the player that they are inside the body of a sick child, and the game painstakingly adheres to the biotech theme throughout, presenting T-cells, antibodies, germs and nanotech cures like "buckyfiber pathways." I did my best to come up with a plausible biotech battlefield, trying not to bend too many facts.

Is Cell a new genre of game, or is it more of an experiment, pushing functions to new levels?

About four years ago, when I first started to tinker with colored boxes, I had this vision of dazzling the world with one radically different cell-based game after another: first an arcade game like Cell, then a puzzle game, then an RTS, and somewhere down the road an MMO. I felt like I had stumbled upon multiple new genres of games. Now I'm releasing Cell into a market that is flooded with cell/voxel/box games, like Minecraft and all the Minecraft clones, and the various voxel-based shooters. So I think there's a big space of possibility opening up, but it's certainly not being defined by Cell alone.

How has the player reaction to Cell been so far?

The game is generating strong enthusiasm within a niche audience, typically hardcore action gamers and engineers, along with some head-scratching within the mainstream, which is in line with the reactions to the early promo videos. The game isn't a twist on an existing formula -- e.g. "A platformer that does X" -- which is a great foundation for an indie game, because an audience can "get it" right away. Cell is its own animal, inspired directly by the organic behaviors I observed once I had "3D cellular automata" running at a high framerate. It requires some trial-and-error learning, and even with help text, tutorial subtitles, and now a tutorial video, it's too much for many casual players.

A good litmus test for prospective players: Remember (or imagine) that moment in Defender when you first shot a pod, it exploded into a half-dozen speedy red saucers, and you died in 1.5 seconds. If you thought that was awesome and were ready to plunk another quarter in for a rematch, then Cell might be for you. If you thought it sucked that the game didn't tell you there was a pod coming, that your goal was to destroy it, and that you had better be careful because it contained flying saucers, then you will likely lose patience with deciphering the behaviors in Cell and learning how to control them.

Eidos Montreal said you did some consulting work on Deus Ex: Human Revolution -- how much did you change or suggest be changed from their original design or story?

I was honored to have a seat at the table during a couple of the early story-design meetings, and I was able to provide some feedback on a draft of the script. They were very open to input, and I feel like I got my two cents on the table, but in truth they had drawn a good bead on the Deus Ex 3 story without any help from me. I and some of the other original Deus Ex team members had felt for a while that what the franchise needed was a prequel in order to get back to the near-future grit of the original, so I was pretty delighted after trudging through a foot of snow in Montreal to hear that this was the direction they had chosen on their own.

I was in the loop for continuity questions throughout, but by the end the questions were getting so detailed that I was tracking down original level designers in Austin, who themselves didn't know the answers. So by the end the team in Eidos Montreal had become the experts on the Deus Ex universe.

What did you think of the final product?

It's great to see visual storytelling applied to a Deus Ex story. The early games' reliance on generic animations -- i.e. treating characters primarily as entities within a game system -- put a lot of pressure on the dialogue, whereas in the current title the essence of an idea can come across in a look on a character's face, leaving players free to take their time learning all of the names and allegiances.

The environment, too, is filled with hand-crafted set pieces that communicate story -- another departure from the earlier titles, in which a design goal was to populate scenes primarily with game objects. It took me a while to get used to how static these beautifully detailed set

pieces are, but I think to really grow up games need to let visual artists work their own storytelling magic somehow.

Do you feel Human Revolution earned the Deus Ex name?

Most definitely. The team up there approached the franchise with nothing but reverence, heightened I think by the fact that they were a step removed from the initial genesis of the idea. I think they did a great job of reinvigorating the series.

What's next for you and New Life Interactive?

I'd love to find a lightweight way to make "cellular automata" a creative activity for players. Let them play with mold, acid, lava, poison, and maybe the rule logic itself.

I don't know if that would be a simple Paint-style app, or something more themed and game-like, but I started this technology with an eye on the RTS space, hoping to make a game in which players could build tools and defenses with colored boxes. So I'd like to take a first step in that direction and let players help me figure out where to go next.

Cell: emergence is available for download for PC via Desura, GameStop, GamersGate, Greenman Gaming and Gamefly for $9, or on XBLIG for 400 MS Points ($5).