

the *Escapist*

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360 TO THE
MOON

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by Joe Blancato

"It's the Year 2000, but where are the flying cars? I was promised flying cars. I don't see **any** flying cars. Why? **Why?** Why?"

- Avery Brooks, on Flying Cars

Ahh, the flying car. If anything was an icon of 1950s American Cold War idealism, it was the flying car. Come the year 2000, long after we'd busted the Soviets down to size, we'd take to the wild blue yonder in that most American of contraptions, the mass-produced automobile, and wrap an arm around our stay-at-home spouse, look back at our 2.5 children and soar into the heavens as kings of the world. All this and more, in the Year 2000.

Well, 2000 came and went, and while European communism is dead and gone, my car still has tires, and unless I have \$500,000 and a pilot's license, I'll never know what it's like to drive along the Z-axis. Why? **Why?** Why?

The fact is, we don't need flying cars. We don't need the Z-axis to travel faster. No,

the engineers forsook *The Jetsons* and decided instead to shrink the world to the size of a microchip. You can talk to your best friend in Sri Lanka (whom you've never actually seen in person) from your vacation spot in Aspen, either from your webcam-enabled laptop or your Blackberry. And every day, the world shrinks a bit more.

Paradoxically, the more available the world is to us, the less reason we have to actually visit it. Every time a new user stakes his claim to a corner of the internet, we grow more connected to each other, and our need to leave our physical position becomes less significant.

And so, here we are in 2007, closer to the world than anyone in the 1950s could have imagined, but I still don't have my flying car. And as much as I like the present we're in, the future of the past had a much nicer ring to it. In this issue of *The Escapist*, we're investigating other broken promises from the past, as well as what the new future, the one the scientists of old couldn't predict, might have in store for us.

New contributor Susan Arendt investigates how the science fiction from

the past affects the science fiction of the future. Allen Varney returns to discuss the state of the art in 3-D video displays. Lara Crigger speaks to scientists about mind-controlled gaming. Erin Hoffman investigates the effects of brain training games on the elderly. And Spanner compares futuristic blood sport movies to the reality game shows of today.

So fire up your Smartphone, put the top on your grounded convertible down and gaze skyward with us, in this issue of *The Escapist*. At least there won't be any traffic obscuring the clouds.

Yours,



LETTERS TO THE EDITOR

To the Editor: I've had a Wii for about three weeks now. Before the Wii all my video game playing involved me going up to my loft and logging into WoW while my wife sat alone watching TV for the

night. Ever since I walked in the door that fateful night three weeks ago my wife and I do something at night that I never thought we'd ever do. We play video games together. And it's amazing. She is particularly fond of bowling and has become very competitive at it, with pro status and a high score of 284.

This past weekend we took the Wii with us to her parent's house for a late Christmas. Her older brother and younger sister both came with wife/husband and our 1- and 3-year old nieces in tow. When the kids were put to bed around 8PM we all went up to the pool room and played the Wii all night long, every night for the duration of our stay there. To be honest I don't think my wife's parents have played a videogame in their lives...but they got hooked on the wii. The second night my mother-in-law played she reached pro status and got a high score of 233. My father-in-law tore up my younger brother-in-law in 3 rounds of boxing. We probably had the most fun we've ever had as an entire family and it's thanks to Nintendo and their amazing little console.

- Iain Burns

In response to "Skill-Stick Revolution" from The Escapist Forum:

I, um, hate to be the one to break it to you, but aside from the more comfortable grip and the extra pair of shoulder buttons, the 360 controller is largely the same as the Xbox's, and not terribly different from the Gamecube's. So the innovative part is not the controller, but how it's used. Not that it at all undermines the point of the article. It's strange, though - sports games, by conventional wisdom, are the place you'd be least likely to see change in the formula.

- Bongo Bill

In response to "Seed on the Road" from The Escapist Forum:

We never got a chance to play seed even tho me and my boyfriend had long awaited it but we had connection problems and werent too keen on paying the price they wanted for a game that appeared broken. We crossed our fingers and hoped it would get things straight and i checked from time to time but then one

day the page wouldnt open and i knew it was a goner. If I had the money I would have invested in seed because I think it was a great idea and that there is definitely a niche in the game community for this type of game.

- catalyzt

To the Editor: I think you should do an article about how games are spreading out. While 6th generation consoles were very similar in muscle it was not uncommon for big-name publishers to release games on all the consoles, meeting the capabilities of the weakest of the systems, which was the gamecube mostly because of the smaller capacity of the proprietary disk, but the games didn't seem weak by comparison when something on the xbox could also be run on the gamecube. With the new generation of consoles, the processing power of the consoles is spreading out with the ps3 being much, much more powerful than the wii, with the 360 caught in the middle. In an attempt to have a larger potential buyer base,

companies will release games on both the xbox360 and the ps3 because of their traditional control schemes, and thus won't exceed the xbox 360s power on the ps3.

- Atmosck





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When it comes to the canon of literature, science fiction tends to get written off as the literary equivalent of junk food, enjoyed only by kids and socially awkward brainiacs who never quite grew up. Though some “experts” may find it difficult to give much weight to works involving robots and ray guns, few genres have proved as profoundly inspirational and prophetic. Whether it’s the “hard science” fiction of Jules Verne or the softer, more romantic stylings of H.G. Wells, it’s impossible to deny the long-lasting impact the works of early sci-fi authors have had. The question, though, is why? What is it, exactly, about these early tales of flights in hot-air balloons and trips through time that continues to touch us, decades later? As is so often the case, to find the answer we must go back to the very beginning.

In terms of being particularly influential, Verne had a lot going for him. He’s largely considered to be the first of his kind, the father of the sci-fi genre, and as such is given a reverence that his followers will never quite be able to equal. Ray Bradbury gave Verne the ultimate credit when he said, “We are all, in one way or another, the children of Jules Verne.” Polar explorer Admiral Richard Byrd said, “Jules Verne guides me.” William Beebe, one of the first men to explore the depths of the sea in a bathysphere, said his interest in oceanography began in the pages of *20,000 Leagues Under the Sea*. Robert Goddard, father of rocketry, was an avid Verne reader as a child. Verne also inspired a long string of authors, including H.G. Wells, who in turn inspired Arthur C. Clarke, and so on. Not too shabby for someone whose last novel was published nearly 100 years ago.

Also working in Verne’s favor is his choice to follow the path of so-called “hard science” fiction, meaning he imbued his wild tales with just enough science fact to make them seem not just possible, but inevitable. In *From the Earth to the Moon*, Verne describes a trip to the moon in a gunpowder-filled rocket that’s little more than a giant flying bullet. The trip as described would’ve crushed the rocket riders into squidgy jelly, but by fueling his rocket with something as commonplace as gunpowder, he makes it feel like it’s almost real enough to touch. Reading Verne’s story, it becomes easy to think that, with the right equipment, some elbow grease and a really

by Susan Arendt

good tailwind, we really could fly to the moon, or Saturn, or anywhere else the mood took us.

There's something about the idea of leaving Earth's boundaries, of not just leaving your house, your town or even your country, but traveling to somewhere the laws of everyday life simply don't apply, that's positively intoxicating. Thus we come across another component of Verne's particular brilliance: He, and other masters of the sci-fi genre, entices us to visit other worlds, both literally and figuratively. We humans are a terribly curious and fickle lot, constantly peeking over our fences to see what's on the other side. The only idea we like more than visiting some uncharted or undiscovered country is the notion that we might be the first ones to do so, and it doesn't matter if that unknown territory is among the stars, under the waves or in a lab.

The genius of Verne, and successors like Isaac Asimov and Arthur C. Clarke, is that their work taps into our innate desire to achieve. Humans succeed as a species because we're constantly trying to do more, be more, have more, and science fiction feeds that need and gives

it shape. We have robots today because of their efficiency, practicality and safety, and while we appreciate them, what we really want are the automatons we've read about since we were kids. Asimov's Three Laws of Robotics are so ingrained in our consciousness that we feel like we're already halfway to our own robot butler, so we keep trying to make a robot that could pass for human, not because it would be particularly useful or helpful, but simply because we **want** it.

Without question, science fiction's greatest authors have kick-started the imaginations and lit the inner fires of some of the most important men and women in history, but it seems somewhat unlikely that stories from sci-fi's golden era will provide the same sort of catalyst for the great minds of tomorrow, if only for practical reasons. Though Verne's Nautilus was quite amazing when he first described it in 1870, it becomes slightly less awesome when viewed from a world where you can rent a sub for an hour or two to view pretty fishies on your vacation. Wells' *War of the Worlds* still makes for a great movie, but invaders from outer space are slightly less intimidating when you're yawning over pictures from the Mars

Lander in your morning newspaper. Interstellar travel, once the stuff of dreams, has become so commonplace that we barely notice when the space shuttle launches. There are certainly still ideas to be mined from the classics (I still want my robot butler), but many of the stories that were once viewed as amazing are now simply seen as quaint.

Of course, the obvious answer is that modern sci-fi writers will take on the role begun by their forefathers, but this, too, is moderately unlikely. For one thing, people simply don't read as much as they once did, and even when they do, much of what currently passes for science fiction is little more than gussied up fan fiction. (Honestly, how many *Star Trek* and *Firefly* novelizations do we really need?) It doesn't help that science fiction took a decidedly pessimistic turn about 20 years ago, starting with the cyberpunk movement. Granted, as Ray Bradbury said, "We do this not to predict the future but to prevent it," but one can only read so many dystopic views of the future before it starts to become really, really depressing.

If sci-fi literature isn't going to serve as muse, what is? It seems possible, even likely, that tomorrow's brilliance will find

"Asimov's Three Laws of Robotics are so ingrained in OUR CONSCIOUSNESS



that we feel like we're already halfway to our own ROBOT BUTLER"

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its roots in today's videogames. As a mode of entertainment, gaming is at least as popular as science fiction was when it inspired the likes of Goddard and Byrd, and is oftentimes similarly grounded in just enough science fact to make it all seem possible. Gamers become devoted to their franchises of choice, becoming emotionally and intellectually involved in the virtual world the games create, absorbing every nuance and detail they possibly can. The internet just makes it easier for them to indulge their passion; between developer's blogs and community forums, fans have access to nearly limitless information and discussion about game worlds, characters, vehicles, weapons and strategies.

Given that kind of emotional investment, it's not terribly difficult to see how games could still be providing inspiration long after the player has hung up her controller. It's not a huge leap to imagine that the middle-schooler who lives and breathes *Halo* might one day try to devise a regenerating energy shield, or perhaps fashion a holographic user interface modeled after her beloved Cortana. A die-hard fan of *Half-Life 2* may someday create a prototype gravity gun, officially

earning the title of Coolest Inventor Ever. A longtime player of *Tomb Raider* titles may see Lara Croft as the ultimate role model, choosing to emulate her by studying archaeology or world history, traveling the globe to learn about cultures and civilizations long gone by.

There needn't be such a delay between inspiration and payoff, however. A doctor might take a cue from the biomods of *Deus Ex* to try to improve upon current prosthetic design, or a physical therapist may design a *Lost Planet*-inspired exoskeleton that would allow a paraplegic to walk again. The possibilities and permutations are nearly endless, depending only on what particular elements in a game become emotional touchstones for players.

For most players, videogames are simple entertainment, an indulgence in escapism meant to distract them momentarily from the grind of normal life. For a special few, though, videogames might very well plant the seeds from which truly great ideas and life-changing innovations will grow. Who knows? Perhaps one day some Nobel Prize winner will thank Cliffy B., Will Wright or Warren Spector for putting her

on the path to greatness. Personally, I'm hoping someone playing *Phantasy Star Universe* falls in love with the Partner Machines that store your items and deliver your messages. I may just get my robot butler yet. [COMMENTS](#)

When Susan Arendt isn't writing news at 1up.com or her weekly gaming column, Token Female, she's training her cat to play DDR.

// It's not a huge leap to imagine that the middle-schooler who lives and **BREATHES HALO** might one day try to devise a regenerating **ENERGY SHIELD** //

MIND OVER MATTER:

The Man and the Machine

by Lara Crigger

The Journey to the Wild Divine

"Just wait until you see the purple zebra," says Andrew Cutter, a clinical technician at the University of Rochester's Sleep and Neurophysiology Research Laboratory. He smiles and punches a few buttons on his laptop. Seeing my raised eyebrows makes his grin widen. "Trust me, you'll get there."

I've invited Andrew to give me a demo of *The Journey to the Wild Divine*, a special videogame he'd used while working at the Rochester Institute of Technology. I look at the game's box, and in the corner, under hot air balloons and a waterfall, sits a pleasant-looking woman at her laptop while menacing purple clamps crush her fingertips. Inside the box is a CD interview with pop psychologist Deepak Chopra, along with *The Journey to the Wild Divine: The Companion Guide*. Idly, I thumb through its pages, picking out phrases like "The Breathing Tree," "Temple of Great Compassion" and "Axis of the Double Durga."

"You know, this is why people don't take this stuff seriously," I say, tossing the book aside.

"Yeah, I know," he sighs. He fiddles with a pod-like device, which, for all I can tell, is just an overgrown USB port. "But it was the best I could get for under \$500."

The Journey to the Wild Divine is a videogame only in the loosest of definitions. Its gameplay takes input not from controllers, microphones or keyboards, but from your body's natural rhythms, such as breath and heartbeats.

Sensor clamps attach to your fingers and read your skin conductance and heart rate variability; by varying these physiological signs, you can control various elements in the game, from levitating a ball to creating a rainstorm. Essentially, you play the game with your mind, forcing your body, and the game, to do whatever you command.

While *The Journey to the Wild Divine* teaches you how to enter a calmer, more restful state, not all biofeedback games focus on relaxation. Some concentrate on increasing your productivity, others on maximizing your energy levels. "It all comes down to operant conditioning," says Andrew. "Videogames can give you more immediate feedback."

Naturally, ever since I'd heard Andrew mention these games, I'd been dying to give one a go. A videogame you play with your mind? Talk about a gamer's greatest fantasy. What could be more tempting than the complete eradication of any physical effort whatsoever? No more hand cramps. No more carpal tunnel. Just hook up the feeding tube, log on the computer and play until your eyeballs bleed.

the Escapist

More seriously, though, I was genuinely curious about this convergence of mind and machine. Controlling inanimate objects with the power of thought has been a mainstay of science fiction for decades, but here it was, tangible and real. We'd invented the first disintegration of boundaries between man and tool. What could this new electronic evolution mean for paraplegics, amputees and autistics trapped by their bodies? What could it mean for me? Would we one day become ghosts in our own machines?

So far though, such speculation seems entirely unwarranted. For being the next step in human evolution, *The Journey to the Wild Divine* looks awfully like a medieval torture device.

Andrew starts the program. Onto the screen swirl images of stars and nebulae, while an ethereal string quartet swells into a one-note crescendo. "In the beginning," monotones a sleepy, grandmotherly voice, "there were and continue to be the great Gardeners, who live in the Metaverse, a vast farm fertile with energy, creativity, intelligence and love."

I roll my eyes. She continues, unfazed.

"Welcome to the Garden," she drawls. "You are here because you remember that you too are a Gardener." The camera zooms onto a flower-covered hill, where a woman dressed like a *Lord of the Rings* extra sits and writes in a large book. She finishes her magic poem or whatever and closes the tome, walking off into the distance.

Suddenly, something materializes from a white mist. It is, indeed, a purple zebra. The Tolkien woman serenely leaps onto its back, and they gallop away.

"Andrew ... " I'm not sure I can take this much longer. He chuckles as he places the purple clamps (much like the shade of that striped steed) on my fingers.

Now I'm strolling through a different garden, this time situated on a white terrace. A plump, white-haired woman dressed like Bilbo Baggins' great-aunt welcomes me to the world of the Wild Divine. In a husky smoker's voice, she informs me that "this is a place of magic." I wonder how much she was paid to do this. Whatever it was, it wasn't enough.

She points me toward an eight-point pinwheel, ordering me to blow on the object and make it turn. For a moment, I stare blankly at the screen, still processing my task, before obliging her with a tentative huff. The pinwheel nudges slightly. Intrigued, I blow harder, as if I were trying to spin a real-life pinwheel. In response, the digital one spins rapidly.

Okay, for all the gardens and zebras and women in Ren Faire garb, that **was** kind of cool.

We Can Rebuild You ...

Biofeedback games like *The Journey to the Wild Divine* are not the only way scientists have been experimenting with thought-controlled machinery. Recently, artificial limbs like the Bionic Arm have entered the clinical testing phase.

The Bionic Arm is a six-motor cybernetic prosthesis controlled entirely by its owner's thoughts. Developed by Dr. Todd Kuiken, director of the Neural Engineering Center for Bionic Medicine at the Rehabilitation Institute of Chicago, the prosthesis is the result of over 20 years of research efforts. "My goal with amputees has always been to develop more natural



and graceful prostheses," says Kuiken. "Prosthetic technology is primitive, and I knew we could do better."

Through a surgical process known as "targeted muscle reinnervation," nerves that once connected to the amputated arm are rerouted, linking instead to healthy muscle fibers in the chest and shoulder. The motorized prosthesis is then attached the site of amputation. The rerouted nerves can now direct signals to the robotic limb using surface electrodes; thought-generated impulses are interpreted and travel down the arm, guiding its movement. The result: When the patient thinks about moving his arm, he does.

This is quite a step up from the body-controlled hands, hooks and other prostheses currently available on the market. Essentially just scrap metal, wood and plastic co-opted by the patient to approximate the missing limb, these limbs are awkward and frustrating to manage. "They can be clumsy, tiring and hard to learn how to use, especially for those with higher amputations," Kuiken explains. "The thought-controlled arm allows its user to move in a more natural way - simply by thinking."

Since the Bionic Arm's invention in 2002, seven patients have undergone targeted muscled reinnervation, says Kuiken, and the surgery has been successful in all but one case. Jesse Sullivan, a Tennessee man who became the first to be outfitted with the Bionic Arm, has received most of the media attention. Once a power line worker, Sullivan lost both his arms in 2001 due to severe electrical burns. Four years later, he volunteered to test the new technology, and his progress has been astonishing. The greatest surprise is that Sullivan has actually recaptured some sensory ability with his robotic limb. He can now sense heat and vibration with it, and if you press on his chest muscles, he feels as if you'd touched his mechanical pinky.

Kuiken hopes to one day use the Bionic Arm for veterans returning from combat operations in Iraq and Afghanistan. As of 2006, more than 400 amputees have been treated in Army hospitals; the Bionic Arm, Kuiken hopes, has the potential to vastly improve their lives. The Defense Advanced Research Projects Agency agrees; along with money from the National Institute of Health, Kuiken's research is funded by a multi-lab grant from DARPA worth almost \$50 million.

All this makes a thought-controlled videogame seem like a trivial enterprise; if we can construct artificial body parts that our minds can control, we can certainly design other electronics to mentally interface with. Like Sullivan, we can literally become one with our

machines; by manipulating them at a primal level just at the boundary of consciousness, we could bend them entirely to our will.

Mind Over Videogame

I continue experimenting with *The Journey to the Wild Divine*, juggling energy balls and waving mystic wands. Eventually, however, I'm taken to a courtyard, where a tall black man, also dressed in Shakespeare's hand-me-downs, stares contently at a purple ball floating by his outstretched hands.

He jibbers about more Gardening mumbo-jumbo crap, and by this point, I've learned to tune out anything that sounds remotely New Age or hippie-esque. Therefore, I almost miss it when he tells me to clear my mind and that with calm, even breaths, I can control the ball at will. "We call it Peaceful Breath," he says. Oh man. Whatever you say, dude; I hope you got paid as much as Great-Aunt Baggins over there. I click on the ball.

I know I'm supposed to be calm and centered instead of three seconds away from losing my shit entirely, but I can't help it. His faux-mystic demeanor is so



“The **THOUGHT-CONTROLLED** arm allows its user to move in a more natural way - **SIMPLY BY THINKING**”

unnatural and stilted that I'm finding it hard to stop giggling and achieve my Peaceful Breath. In fact, the more I try to breathe slowly and deeply, the funnier his hokey speech becomes. I think I've developed spontaneous ADHD. Man, I'd be the worst Zen Buddhist **ever**.

I shake my head and start over, forcing my breath to be deep and powerful, like the inhalations they teach you in Pilates. But the ball stands still. The cello music seems to get louder, even angry. Bigger, deeper breaths now, like a yak in heat. Still nothing. Andrew looks over at me and snickers quietly. I try again, but that ball just isn't going anywhere.

With a sigh, I look away from the screen to clear my head. My eyes light on my fish, a little aquatic Buddha, swimming in his tank across the room. Watching him methodically pace his tank, figure-eighting around his shipwreck and schooling with his own reflection, I feel much calmer and lighter. The giggles have stopped. I breathe shallowly, but slowly and easily as well.

The man abruptly laughs. "There it goes! Very good!" and I'm amazed to see that the purple ball has levitated its way off

the screen. It took me more than five minutes to get that ball to move, but eventually, I got it. I feel very strange and pleased with myself. For all its New Age hokum, the core game mechanic in *The Journey to the Wild Divine* is actually really cool.

Noticing my grin, Andrew smiles, too. "Good job," he says. "You did well."

I ask him what he thinks about *The Journey to the Wild Divine*. He pauses before replying. "Videogames have gotten kind of a bad rap, because for a long time, they were just about instant gratification, something to do when you didn't have anything else," he says. "But videogames don't necessarily have to be just for entertainment. You can use them **for** you, instead of allowing them to merely take up your time."

While optimistic about the potential for thought-controlled electronics and devices, Andrew insists that *Journey to the Wild Divine's* importance isn't the technological advance, but in better understanding the power of our complex minds. "Our brain is pretty much set up to do whatever we want it to do," he

says. "You can teach yourself anything, and to an incredible degree."

Will we come to a point where computers become neuroprosthetics, electronic devices that can literally read our minds? After this, I still don't know. The Bionic Arm is incredible progress, but judging by *Journey to the Wild Divine*, we've still got a long way to go.

Thankfully, too. As fun as it was to levitate a ball with my thoughts, I'm not sure I'm ready to ride off into the sunset on a purple zebra. At least, not yet.

COMMENTS

Lara Crigger is a freelance science, tech and gaming journalist whose previous work for The Escapist includes "Playing Through The Pain" and "How To Be A Guitar Hero." Her email is lcrigger@gmail.com.

“I’d be the worst **ZEN BUDDHIST** ever.”





Will computer games ever truly breach the third dimension?

by Allen Varney

Every “three-dimensional” game you play is a **pussy**. On your flatscreen TV or monitor, your so-called 3-D game presents nothing but an illusion of depth, a sleight, a fake. When will we get computer gaming in three real, no-kidding spatial dimensions?

Answer: By some standards, it’s already here. But if you’re waiting for something really cool, stick with the fakes.

Getting to Third

A device that creates 3-D imagery is **stereoscopic**. If the images are viewable without special gadgetry (glasses, goggles, ViewFinder), the device is **autostereoscopic**.

Flat-panel monitors create 3-D effects using “spatially-multiplexed parallax” to create a different image for each eye. Everyone knows anaglyph images, those movies and comic books with red and blue images printed out of register. The illusion of depth arises when you view them with red-blue glasses. One anaglyphic computer game, among many, is Polish programmer Jacek Fedorynski’s Quake II for Red-Blue 3-D

Glasses; he’s the guy who did Text Mode Quake II. There are several other kinds of stereoscopic goggles, like electric shutter glasses that flick open and shut 50 times per second in synchrony with “right” and “left” frames on your monitor. If you try playing *Counter-Strike* that way, please post Flickr photos of you wearing the goggles. Tag them “dork.”

The main problem with stereoscopic glasses is, after using them you throw up. Fortunately, there are many ways to create autostereoscopic (non-goggled, non-nauseating) parallax, such as splitting the screen via physical barriers, polarization and beam splitting. A promotional .PDF brochure from 3-D monitor company SeeReal Technologies includes short summaries of some major hardware approaches.

You can also get an autostereoscopic effect with software alone, such as the popular Raster3D program scientists employ for molecular imaging. Workstations that use Raster3D often split the screen into side-by-side “stereo pair” images, so you must cross your eyes to see them in 3-D.

The 3-D monitor industry simmers continually. The Stereoscopic 3-D Web Ring currently has 139 members. Established enterprises like Dimension Technologies and Real D Scientific, as well as relative newcomers like SeeReal, cater mainly to the military, oil companies and specialized markets like industrial CAD/CAM prototyping, scientific (molecular and medical) imaging and photogrammetry, the spy's practice of deducing physical dimension of objects from measurements on photographs.

Gaming? Not so much. In 2004, SeeReal licensed its technology to the German game company Trinigy for use in the Vision game engine – seemingly without result. None of the other companies boast gaming connections.

Meanwhile, work in holographic animation, or holovideo, has slowed a lot since MIT's famous Media Lab closed its Spatial Imaging Group in 2004. The holographic video project created only two prototypes, the Mark-I and the Mark-II, but "the Mark-1 display is capable of rendering full color 25x25x25mm images with a 15 degree view zone at rates around 20 frames per second". The Mark-II display provides 150x75x150mm

images with a 36 degree view zone at rates of around 2.5 frames per second" – unexciting benchmarks for a *Halo* player.

Some MIT Media Lab grads later founded Zebra Imaging, a 3-D holographic imaging company that makes a cool Holo-Touch Workstation not far short of *Minority Report*. But again, they promise no gaming prospects.

If you want this hard-nosed commercial tech adapted to something as frivolous as gaming, it turns out you must go – where else? – on campus.

Real Quake

In June 2004, the online edition of the electrical engineering journal *IEEE Spectrum* made a rare venture into science fiction with Vernor Vinge's story "Synthetic Serendipity," excerpted from his 2006 novel *Rainbows End*. Vinge presents a world blanketed with sensors, always-on and pervasively networked. Characters move easily through this ocean of mediated information, interfacing with it through contact-lens displays and clothing that senses twitching muscles. Harry Goldstein's companion article to "Serendipity" outlines the tech underlying this

augmented environment – cheap sensors, mesh networks, ubiquitous computing, haptics and what some call "augmented reality" (AR).

Goldstein mentions *ARQuake*, a 2001-02 research project by the Wearable Computer Lab at the University of South Australia in Adelaide. As described in the *ARQuake* FAQ, "We modified *Quake* to take its view information from a GPS and orientation sensor, and so as you walk around, *Quake* moves in sync with the real world. Monsters and buildings appear to sit in the real world as though they were really there, and then you can play a game of *Quake* while you are in the real physical world." They used *Quake* because it's open-source, and because they needed to keep the monsters stupid: "When running around outside, it is not possible to move at the same speed as on a desktop ... so if the monsters are too smart and too fast, they will always beat you. In *Quake*, we

The main problem with stereoscopic glasses is, after using them you throw up.





If you want this hard-nosed commercial tech adapted to something as frivolous as gaming, it turns out you must go - where else? - on campus.

use monsters which are intentionally slow and not too powerful, to give the player a chance to actually beat them.” The team later revised *ARQuake* as part of the ongoing Tinmith project, which includes their *Black & White*-like *Hand of God*. You yourself can’t play *ARQuake* – the lab is busy, and the hardware costs way too much – but some of the principals have started a company, A-Rage (for “Augmented Reality Active Game Engine”) that is working on *AR Sky Invaders*, a commercial *Space Invaders*-type game.

The Augmented Environments Laboratory at the Georgia Institute of Technology has created *ARCraft*, a real-time strategy game. “Using head tracking and wand-based interaction, each player navigates his or her fighting force around obstacles while hunting for the enemy. Our research goal is to investigate how people can use AR to work together (or against each other) in a shared virtual space while maintaining remote physical spaces.” Again, though, *ARCraft* is private. You can’t play. Go home.

If not augmented reality, what about virtual reality? It’s just like AR, except

you can’t move around. Arguably the world’s best-established 3-D view technology is the CAVE, or Cave Automatic Virtual Environment. Standing in a dark 10-foot cube with sides made of rear-projection screens, you wear (groan) shutter glasses with positional sensors. Projected imagery surrounds you and moves in response to your head movements. CAVEs have been around for 15 years, and lots of campus computer science departments have one. They’re used for medical visualization, prototyping, cognitive psychology research and urban planning, but not for gaming – at least not where the Board of Regents can find out.

In case you can’t muster the six-digit installation cost for your own CAVE, you might try the budget versions, ImmersaDesk and Infinity Wall – though these basically amount to home theater setups.

One nasty problem with CAVEs and augmented reality is, after you try it for a few minutes – stop me if you’ve heard this one – you throw up. Simulation sickness is caused by lag in the onscreen visuals in response to your head

movements. Even delays measured in milliseconds can make sensitive users queasy. They never talk about that on the *Star Trek* holodeck.

Volume, Volume, Volume

You've already noticed all these methods still use bogus 2-D flatscreen fakery. For genuine three-dimensional graphics out in real space, you're talking volumetric displays. As the remarkably good Wikipedia article notes, the chief problem with volume of the "Help me, Obi-Wan Kenobi" kind is the mind-boggling amounts of data it requires: "For example, a 24-bit 70 volume/sec 1024×1024×768 display might need up to 180 GB/s transferred to the electro-optic modulator components."

Volumetric engineering has made slow, incremental progress, but it's been acceptably steady. Actuality Systems already markets a pricey industrial 3-D display. "Perspecta provides hologram-like spatial 3-D full-color and full-motion images that occupy a volume in space. Users experience an all-encompassing 360-degree view and simultaneous multi-view collaboration without goggles

or any assistive device." Actuality targets medical markets, though an October 2006 interview with Actuality founder Gregg Favalora tantalizingly mentions "exciting, hologram-like displays for the desktop and arcade."

San Francisco-based IO2 Technology sells a "floating free-space interactive display," the M2 Heliodisplay. It's a high-tech fog generator that projects an image onto a cloud of micro-droplets. So far, it generates only a 2-D image. Inventor Chad Dyer said in an interview, "You can play games on the Heliodisplay, but the picture quality would work for only certain types of games today." He added, optimistically, "This is not to say that with a future version this would not be more widely adopted."

Research continues. In late November 2006, Japan's National Institute of Information and Communications Technology (NICT) and Kobe University demonstrated a thin-panel device that forms 3-D images in the air.

What do all the companies and institutions cited here share in common?

That's right – no gaming connection whatever. For volumetric gaming, you can't find anything beyond a few oddball art projects, like the Matrixx 3-D display built in April 2006 by electrical engineering students at the Delft (Netherlands) University of Technology. What was the Matrixx? In this case, it was a giant array of 8,000 red diodes in 8,000 suspended ping-pong balls connected with four kilometers of copper wire. This grandiose thingy, the largest electronic 3-D display in the history of the world, let passersby play – woohoo,

hold me back! – 3-D *Snake*, *Duck Hunt* and *Pong*. That, friends, is the state of the art in true 3-D gaming. Oh well, at least it'll get here faster than your robot housekeeper and your personal helicopter. [COMMENTS](#)

Allen Varney designed the PARANOIA paper-and-dice roleplaying game (2004 edition) and has contributed to computer games from Sony Online, Origin, Interplay and Looking Glass.

**For volumetric gaming,
you can't find anything beyond
a few oddball art projects.**





IN THE FUTURE, THERE WILL BE NO WAR

by Spanner

Over the years, we've been regaled by a vision of a wonderfully dystopian future where we - the little people - will be distracted from the vast liberties taken by a corporate controlled tyranny by some form of bloodthirsty designer sport, only to excel at that brutal form of entertainment and change society by scoring one last goal.

Now, the millennium's finally rolled around we see that, much to our interminable vexation, there was no computer initiated nuclear war, alien invasion or devastating global economic collapse to usher in a new age of savage entertainment and human based blood-sports. Instead, we are plagued by a society-gone-insane for a fun-murdering "health & safety" fad, and our chances of a drunken Sunday afternoon watching Houston battle Tokyo on the *Rollerball* rink are, if anything, further away from realization than ever.

There are attempts at investigating the notion, such as *Fear Factor* and *Survivor*, but these are handled in such tooth-achingly saccharine ways the shows could cause diabetes (with any semblance of credibility thoroughly

ploughed into the earth by gigantic, tawdry publicity machines).

And what does it say about us, the entertained, who watch these facile programs? Do we watch them due to their core entertainment values? Hardly. We watch them in the hope that something will go wrong, and for a brief and wonderful moment the triteness of *Fear Factor* will metamorphose into the life altering events of *The Running Man*. We would talk for years to come about how we saw a "contestant" fall to his death on live TV, or skewered his brain through the eyeball with a reinforcement rod, or ran headlong into another contestant and broke his spine in four places before falling into a vegetative coma for 10 years.

It all sounds pretty repulsive when it's spoken about so blatantly, doesn't it? But let's not pretend that a show which promised **and delivered** this kind of fatal excitement wouldn't have ratings through the roof. Though it's certain to be remembered as a dire tragedy, Steve Irwin recently proved our love of dangerously real entertainment. Why else did people watch him aggravate

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animals for so long, if it wasn't for the chance that one of them would prove the lethal abilities he regularly told us about? No use complaining when it happens.

We may have developed a peculiar set of moralistic and socially-restrictive boundaries when it comes to civilized entertainment, and we may cluck our tongues and throw sanctimonious eyes skyward when it comes to violent sports, but the fact remains that when all programmed notions of civility are stripped away, violent, aggressive entertainment is intrinsically compatible with raw human nature.

Naturally, videogames have stirred up more than an equal share of the controversy when it comes to flaunting supposedly decadent and irresponsible forms of sadistic entertainment. Indeed, the industry was still new when the first sectarian protests against "playing the digital bad guy" arose in 1976 due to an arcade game inspired by the controversial movie *Death Race 2000*.

The forerunner to the videogame, starring David Carradine and Sylvester Stallone, caused plenty of uproar all of its own, though time seems to have

tamed it and branded it with something of a chintzy visage. The story entailed a tyrannical government's practice of distracting the oppressed populace by staging a cross country road race which required the drivers to kill people en route to score points (the basis for many a contentious computer game to come, wouldn't you agree?). As with many of these murderous franchises, the protagonist not only comes out on top of his chosen sport, but manages to topple a government in the process.

Hell, if a few rounds of potentially fatal televised violence could get rid of some of the nutcases running today's world, who wouldn't be tempted to get behind the wheel?

Even in 1975, opinions of acceptability were considerably different than today's. More relaxed in some aspects (infanticide and unprovoked murder were no problem), while remaining dogmatically Victorian in others (no swearing, please, we're reactionary). Movies were at least age restricted, but videogames were for kids, and when the new *Death Race* machine from Exidy gave players the opportunity to take on David "Frankenstein" Cassidy's role from

the cult movie, moral panic hit the arcades of America.

Despite protests from the company's president, Pete Kaufman, that drivers were in fact plowing down "gremlins" rather than human beings (despite the prototype game having the wonderfully esoteric title *Pedestrian*), *Death Race* was all conscientious objectors needed to condemn yet another form of entertainment. Placards were at the ready, and it was time to picket the amusements.

Naturally, the press leapt on the bullet points of the story, and the more people objected, the more gamers wanted to play it. Although *Death Race* ultimately fell among thieves, its mass publicity certainly

put the failing videogame business on life support until the early '80s.

One way or another, *Death Race* proved gamers love for unnecessary violence, and an unspoken, unacknowledged sub-genre was born.

Similar only in its approach to a dystopian society controlled by barbaric entertainment, the 1974 short story

When all programmed notions of civility are stripped away, violent, aggressive entertainment is intrinsically compatible with raw human nature.



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You want people in front of the television instead of picket lines. Well you're not gonna get that with re-runs of Gilligan's Island!



Roller Ball Murder, by William Harrison, was adapted into the cult film we know and love, *Rollerball*. Harrison's vision, which utilized the designer blood-sport as an outlet for people's increasingly antisocial feelings, has had a considerably more profound impact on fictionalized, ferocious entertainment than *Death Race*. What's interesting is *Rollerball* is only part of a real-life legacy that began in 1935.

A movie promoter named Leo Seltzer attempted to capitalize on the bizarre 1920s trend for dance marathons, and by cross breeding it with the new roller skating fad, evolved the increasingly labored spectacle into a simulated cross country race. Dozens of two-man teams were required to circle a race track thousands of times on roller skates; disqualified if both racers were off the track at any one time. The Transcontinental Roller Derby became massively popular, but never more so than when catastrophe struck.

The sheer number of contestants (all desperate to win the diminutive prize money so they might claw their way out of the Depression) often led to mass collisions and injury; at which point the

crowds went wild. The "sport" was tweaked to maximize on physical contact and the potential for carnage. This formed the basis for the sporting aspects of *Rollerball*, which in turn laid the foundations for a host of futuristic games of savage consequence in both the movies and our gaming media.

The films never really came thick and fast, but a steady drip-feed of varying quality titles has sated some small part of our aggressive natures. Although Arnie's one-liners weren't quite up to his usual standard, *The Running Man* was, curiously, a vast improvement over the original book written by Stephen King (under the pseudonym Richard Bachman). The original tale told of a game show whereby contestants volunteered to go on the run from studio appointed hunters and were required to post in video diaries twice a day, the disappointing twist being the studio made surreptitious use of the postmarks to determine the whereabouts of the ill-fated players.

The movie improved on the concept by correcting the book's major flaw: the game. The rules in the book were distinctly inconsistent and underdeveloped, while the film clarified,

simplified and exemplified. The nature of *The Running Man* was best explained in one simple outburst from the movie's wonderfully reptilian antagonist, Damon Killian: "Well, it is a contact sport, OK? You want ratings. You want people in front of the television instead of picket lines. Well, you're not gonna get that with re-runs of *Gilligan's Island!*" Indeed we are not, and for a lack of genuine entertainment in the style of *The Running Man*, we have been forced to look to fiction in order to satisfy our feelings of social repression.

But even these dramatized sports have encouraged people to physically explore the more brutal side of their nature. The 1989 post-apocalyptic Australian movie starring stony-faced veteran Rutger Hauer, *Salute of the Juggler* (also known as *Salute to the Juggler* and *The Blood of Heroes*) has seen the contact sport around which the story revolved mutate into an actual amateur league.

The object (in the film) was for two competing teams of players armed with rudimentary weaponry to place a dog's skull on a spike at the opposition's end of the play area. Naturally, the means by which this was achieved was pretty much

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left to the conscience of the team members. The movie then went on to inspire a group of German's to form their own "juggler" league, which has received considerable amateur recognition, and has since spread to Australia and the U. S. Naturally, the weapons are well padded and contact is limited, but the mere existence of independent juggler teams exemplifies the feeling of dissatisfaction permeating the global super-sport business.

As the Juggler first took to the nuclear wastelands, a U.K.-based software developer, The Bitmap Brothers, released a sequel to one of their debut games, *Speedball*, and redefined brutal-sport entertainment in a way that has yet to be surpassed.

In 1990, the beauty of mayhem, allure of destruction and glamour of violence were skillfully woven into *Speedball 2: Brutal Deluxe*: a Commodore Amiga game of pure, knuckle-whitening carnage capable of corrupting even the most devout pacifist into a blood hungry, designer-sport savage.

Taking control of the newest, most pitiable team in the *Speedball* leagues,

Brutal Deluxe, it's the player's misfortune and privilege to take this down-at-heel gang of miscreants to the top, by fair means or foul. A multitude of upgrade attributes, such as aggression, intelligence, speed and power, built the impoverished team into the fighting force of your design. Whether you preferred to run rings around the opponent with light-footed intellectuals or score points by brutalizing the opposing players with lumbering animals, the team's ability and direction were first decided in the gym and not the arena.

The frantic, non-stop engagement puts the player through a distinct physical and mental ordeal while endeavoring to enact the simple task of carrying a metal ball to the opposite end of a steel-clad pit and post it in a narrow goal mouth. Due to the abundant lack of rules, this high-speed passage into enemy territory is no small task. There is nothing the opposition cannot or will not do to prevent enemy access. In fact, players are actively **encouraged** to inflict sufficient damage to have unfortunate competitors carried away on stretchers by robotic medics, being lavished with points for such vicious conduct.

Available for a plethora of different platforms from 1990 to the present day, *Speedball 2: Brutal Deluxe* is the yardstick by which every game connoisseur should measure sports simulation and, by extension, come to terms with the savagery of human existence and learn to revel in it.

There are no apologies to make for acknowledging all aspects of your animalistic psyche, and though we are unlikely to see any true form of the promised amusement this side of a nuclear war, there is a wealth of material out there for the discerning violence junkie. This unique, unbranded genre which has subtly permeated our media for over 30 years is the unforgiving, shameless pinnacle of raw entertainment, where sport is no longer about winning and losing: It's about living and dying. [COMMENTS](#)

Spanner has written articles for several publications, including Retro Gamer. He is a self-proclaimed horror junkie, with a deep appreciation for all things Romero.

Come to terms with the savagery of human existence and learn to revel in it.





SHARK BONE OR SNAKE OIL?

NOAH FALSTEIN AND THE GREAT BRAIN
TRAINING DEBATE by Erin Hoffman

Lurking beneath the roaring advance of technology and the ever-glimmer of the American Dream's advance into a Roddenberryesque stratosphere are a series of frightening statistics: 4.5 million Americans currently have Alzheimer's disease, a number that has doubled since 1980 and is projected to reach 11.3-16 million by 2050. One in 10 Americans have a family member that suffers dementia; one in three knows someone who has the disease. It is referred to by medical professionals as "a demographic time bomb" and an escalating epidemic that the American health care infrastructure is not prepared to face. Government funds are pouring into neurological research, and in the meantime doctors are rallying to preach prevention to their patients in the form of rigorous dietary maintenance and exercise – both physical and mental.

The overwhelming success of Nintendo's *Brain Age* and *Big Brain Academy* represents a never-before-seen phenomenon entering game development: consumers purchasing games not out of desire, but out of perceived need. The chill of anxiety that simmers beneath such purchases brings an air of reality to a business formerly

concerned only with entertainment. While studies have shown the utility of games in healthcare – and in fact a growing industry conference addresses specifically this – there has long been a lamented gap between commercial software development and the medical community. But that gap, however unsteadily, is beginning to close.

Now joining the fight against cognitive atrophy is one of game design's brightest, Noah Falstein, whose road to the greater good passed through LucasArts and Dreamworks Interactive, and still continues through what he calls "pure-entertainment" games via his private consulting firm. His recent alliance with Quixit, a shiny new company out to save our minds, represents a unique synthesis of neurological research and game design that combines verified scientific process with the growth and support potential of an online community – and then makes it fun.

Games on the Brain

Falstein has long been involved with the serious games initiative, a branch of game development specifically aimed at applying game development principles and process to real-world challenges.

"I firmly believe that working on pure-entertainment games is a noble calling, too; I don't want to minimize that. But making games that are designed to entertain while simultaneously achieving another purpose (like brain training) is a very challenging design exercise, and it's been interesting purely on that level as well."

For a designer whose work in the field includes such beloved and legendary titles as *Secret of Monkey Island*, his notions of game development's potential are concepts to watch. "I really enjoy games that are aimed at pure entertainment, too, and as a freelancer I mix my work with both entertainment-only and serious games. But I do think that the field of serious games is likely to grow faster than other types of games - perhaps even eclipsing entertainment-only titles some day. So I'm committed to working in this area. But if I've learned one thing from a career in the game industry, it's to stay agile and to embrace change, so I hesitate to make blanket predictions about where it is going. It's **one** of the new game fields to watch."

And the science of fun itself - game design - is no stranger to neurological structure and function.

"Understanding how the brain works is very important to game designers. Nearly all the high-level game designers I know are at least interested in the field of brain research, and many know quite a lot about brain function. I've found that understanding how different kinds of decision making are done by different parts of the brain has influenced my understanding and designs of entertainment games, pacing them to use a mix of different brain function over time. The great designs of people like Wil Wright, Shigeru Miyamoto and Sid Meier have been exemplifying these principles for years."

While the idea of playing games to maintain mental health isn't necessarily new (the Alzheimer's Association itself recommends the use of games as part of a mental maintenance advisory package, and the effects of *Tetris* on brain chemistry have had senior citizens tapping away at the puzzle game for years), that idea is just now beginning to gain enough ground as a respected technique to break into medicine - and

business. "Brain training" games thus reach into the heart of game design, and what they're finding pushes the game industry as a whole.

"In one sense, all games are cognitive training tools! But in the specific [sense] of games based on maintaining mental acuity, I see this as a vital, large subset of serious games. I hope that in the future, games like ours will also be increasingly used in research trials to enhance understanding of the brain's function. That would in turn benefit the game industry in general in many ways."

A Mental Workout

The intersection of third-party game development and mental exercise gaming is not unprecedented, but mental exercise games face a series of challenges: Either they're not challenging enough, not varied enough or just plain not fun. Researchers in the past have seen this last as a lesser concern, but as the games-for-health initiative develops, researchers are increasingly realizing that it may be the most important axis.

"I think the key aspect of games that makes them useful - not necessarily superior - is simple fun."

“the science of fun itself – game design – is no stranger to **NEUROLOGICAL STRUCTURE and FUNCTION**”



“FUN” harnesses that most elusive golden fruit coveted by prevention-focused medical professionals: PATIENT MOTIVATION



And “fun” harnesses that most elusive golden fruit coveted by prevention-focused medical professionals: patient motivation. Quixit, which was born when CEO Sheryle Bolton acquired licenses to the France-based Happy Neuron brain game panoply, approaches this challenge bidirectionally: from one angle using Falstein’s design expertise to refine the research-based Happy Neuron games for an entertainment aesthetic, and from another angle creating an online community where hundreds of thousands of potential users can share experiences, engage in friendly competition and, very importantly for primary health practitioners who may only see their patients once or twice a year, track and monitor individual progress. “Quixit is a made-up word that hopefully implies Quiz, Quick and maybe even Quixotic,” Falstein says, and the online service promises a sleek and fun experience already lauded by its visitors.

“My father died of Alzheimer’s-related causes, so I’ve seen first hand how devastating the loss of mental faculties can be. I hope our games will prove to ameliorate, perhaps delay, some of the process of decline for even a few people.

If we could achieve that, I think it would have a great impact on a lot of lives.”

And if Quixit can, through methods that doctors agree assist in the prevention of cognitive atrophy, delay the onset of dementia, the Alzheimer’s Association would agree that its contribution to the solution would be major; 50 percent of Alzheimer’s patients, according to its estimates, could avoid the disease entirely if symptoms could be delayed by five years.

But reaching the right demographic can be difficult. “One problem as I understand it is a very human tendency to stay in your comfort zone, and as with physical exercise, it is important in mental exercise to keep trying new things, pushing yourself to excel a bit. Some people love crossword puzzles, and feel that doing them will keep them sharp. As you’d expect, in practice this means they do stay sharp - at doing crossword puzzles. It’s important to cross-train and push different parts of your brain, and making it fun to do so is one way to encourage people to leave that comfort zone.”

“We do think the eventual audience is nearly everyone, but for a start we’re focusing on people in the Baby Boom generation. Boomers are largely computer-literate, affluent and increasingly concerned about staying sharp as they age. Well, as we age - this is one of the first times in my career I’ve been creating a game aimed specifically at people my age and older, since when I started I was a 20-something making games that mostly teens played, and as the gaming audience aged and expanded into older markets, I was always a bit ahead of the curve. It’s nice to be back in the target age range again.”

Strain Your Brain

But it ain’t all ginseng and rainbows. Particularly with the rise in popularity of Nintendo’s brain training games, the medical community shows consistent skepticism, verging on disdain, for games that claim to make you smarter. The concept of transference is a major concern in cognitive training: There is no doubt that *Brain Age’s* exercises can make your basic math skills improve, but do they really make you smarter? The game’s mechanics are addictive and fun, so the thought that this exercise could actually be good for you gives brain

training games a distinct commercial advantage. But how much of that is smoke and mirrors? Is, as some medical professionals have asserted, Nintendo's *Brain Age* a fancy crossword puzzle? Can a videogame share an ethical ranking with diet pills?

"I think the biggest unique hurdle is just natural skepticism that our games - or any games - will actually help people sustain mental acuity. It's a chicken and egg problem: Until you make the game and have large numbers of people using it over time, you can't prove it's helping - and some people don't want to fund you unless they have that proof in hand. Luckily, *Brain Age* came along while we were in the midst of our initial fundraising, and I think that helped show people that the basic principle is sound for business. Perhaps soon we'll get some hard scientific evidence from *Brain Age* and its sequels, which would make the market better for everyone."

Asked about the medical community's specific skepticism, Falstein said, "I think it's understandable - I have a lot of respect for the scientific method. But I don't think you can make any advance without trying and being willing to risk

failure. Luckily, I don't think anyone is claiming that sorting words or deciphering text is bad for you in any way - and I'm confident time will show it's very good for you."

It seems likely that, with time and deliberation, the medical community at large will come around. *Brain Age's* own spokesperson, Dr. Ryuta Kawashima, notably spoke against games as a waste of time prior to his involvement with Nintendo. If such a prominent brain researcher can make the conversion, it speaks well for the inspiration of future scientists.

For Falstein, *Brain Age's* presence on the shelves, and its commercial success, provided market proof, and despite Kawashima's earlier skepticism, Falstein has hope for *Brain Age's* long term results:

"The more data points out there, the better for all of us." [COMMENTS](#)

Erin Hoffman is a professional game designer, freelance writer, and hobbyist troublemaker. She moderates Gamewatch.org and fights crime on the streets by night.

“There is no doubt that Brain Age's exercises can make your basic math SKILLS IMPROVE, but do they really MAKE YOU SMARTER?”



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