The Avatars Remember Nothing
S. Gill Williamson

The Picnic: July 2110

Stacks of plates sat on tables. Ice chests of cold drinks dotted the lawn. Technicians from Event Recording and Virtual Simulation, Inc., swarmed about the perimeter of the picnic area. Mobile micro-sensors, scattered everywhere, signaled each other in preparation for archiving the event for history.

Amanda joined the guests queuing for last-minute bio-checks. For her, this family reunion was a dangerous mistake. She waved to her parents in the distance. Their fortieth anniversary -- her attendance was required.

"You're crazy to let ERVS do this, Mom," she had warned. "The personal avatars they create aren't just toys that look and act like us, they're living beings."

As a graduate student at Berkeley, Amanda participated in an ERVS experiment. She conducted a one-hour teleconference interview, first with Ramon(A) and then with Ramon(B). She concluded with a fifteen-minute session with each of them. One of the Ramons was her boyfriend, Ramon Mendez; the other was an ERVS personal avatar, a virtual copy of Ramon. She was to identify the real Ramon.

During the hour sessions, Amanda asked a series of questions about personal experiences she shared only with Ramon. Certainly, the virtual Ramon would screw up. But neither of the Ramons made any mistakes. For the fifteen-minute sessions, she changed tactics.

A week before, at a coffee shop with Ramon and her roommate, Tanya, Amanda left the table to get a refill. When she returned, Tanya was whispering to Ramon, her hand on his. "I see you two are having an affair," Amanda said, in a joking voice.

"We're talking about you," Tanya said. "We think you're working too much." Amanda didn't reply. Ramon remained silent also.

For the final fifteen-minute sessions, she quizzed each Ramon about the Tanya incident. What did he think of Tanya, had he noticed her great figure, and would
he like to sleep with her? Both Ramons were stubborn, evasive liars.

At the end of the sessions, Amanda guessed that Ramon(A) was the real Ramon, but the slightly more offensive Ramon(B) turned out to be the correct answer.

Now, after her first year as an assistant professor at CMU, she knew much more about ERVS technology. Ramon(A) was a living being, a sentient avatar.

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An ERVS technician shoved a hand-sized device in front of Amanda's face.

"Dr. Amanda Bishop, welcome to the picnic! Your virtual copy has been programmed. Please pick your spot on the grounds."

People stood in small groups. Their personal avatars would be in the same positions in the virtual picnic and would have, ERVS assured them, the same past memories and expectations for the afternoon as their human counterparts -- the result of extensive personal interviews and neural imaging of each guest.

Descendants of people at the picnic could, using ERVS immersion equipment, attend the virtual picnic and have a pleasant afternoon with their perhaps long dead ancestors. That was the optimistic scenario.

But what if, in the future, some bad guys cracked ERVS security and, using their own immersion equipment, attended the picnic to make mischief? Amanda felt foolish thinking such thoughts, but such behavior was technically possible. She decided to use everything she knew about ERVS algorithms to protect her personal avatar from such possibilities.

"Hi guys," Amanda said, approaching her cousin, Harvey, who stood surrounded by six of his college friends. "Mind if I join you for a moment?" She moved to the center of the group.

A loud buzzer sounded, indicating that the picnic was underway. ERVS simulation equipment, together with the everywhere present micro-sensors, called "motes" or "sand", would record the picnic in great detail for an initialization segment -- approximately the first five minutes. In the future, each replay would start at some random point in the initialization segment and be left to evolve on its own after that. Each replay would be slightly different from any other.

"See that table by the grandstand?" Amanda said. "I want you all to walk over
there with me." She grabbed the shirts of the guys on either side of her and nudged them forward.

"Stop," she said. "Stand here for a moment while I get under the table. Then disperse slowly. Don't tell anyone where I am or I'll hunt you down and kill you." She was only half joking.

The table, covered with a large dark cloth and holding a pair of speakers, sat against a small grandstand. It would be a deafening afternoon for Amanda.

**ERV\S: April 2270**

An immense white building, a kilometer on each side, two stories above ground and six below, sat on the high plains north of Gillett. Cooled year round by power from its own nuclear reactor, it contained the most sophisticated computers in the world. Above the main entrance arched the words EVENT RETRIEVAL AND VIRTUAL SIMULATION, INC. Known worldwide as ERVS, it was the leading company in virtual reality based simulation.

An elderly man, tall with grey hair, entered the building and approached an elevator, its door held open by a young engineer.

"Hi Sandman! What's new?" the engineer asked, with a smile.

Robert Errett, the only senior scientist who worked in the Mote Lab, took plenty of crap. The millimeter diameter motes, derisively called "sand" by the simulation engineers, were tasked with creating the ERVS archival event records.

"The sand is getting smarter every day," Errett joked. "Some emergent behavior is evident. Be careful when you shake out your cowboy boots." Mike said nothing; he seemed to be thinking it over.

In his office, Errett checked his calendar. Nothing for three weeks. Management counted on accurate archival recording during every event, but as long as Errett's motes were state of the art and reliable, he and his group were left alone. He grabbed some coffee and headed for the Mote Lab to check with his technician.

"Hola, Steve!" Errett said as he entered, looking for a place to sit down in the mess. Society for the Protection of Avatars posters announcing events past and future papered the walls. Stacks of SPA newsletters turned the room into a jumbled maze.

"Want to see something interesting? Look at this cluster of motes." Steve pointed
to a flat silicon surface covered by a small clear plastic dome. A small group of three motes, chilled to below freezing, sat close together. "Each mote in this cluster stores a human avatar. The clusters together combine their compute power to simulate their local environment."

"What are you doing, Steve? These motes don't have the compute power to host a human. If you've screwed with their CPUs we're in big trouble."

"I see you haven't checked the specs on these new motes. They're unbelievable."

Errett hadn't read the specs on the new shipment -- a serious failure on his part. He stood in silence for almost a minute, looking at the motes. "This is a very stupid and dangerous thing to do. If management finds out about this, you and I are out of here."

"The company we work for has become a criminal enterprise," Steve said, jumping to his feet and starting to pace around the room. "These bastards are making money off of murder for fun, rape of young women, pedophilia, whore houses for rich bastards and politicians."

Errett had heard all of this before. By going outside his need-to-know security domain, Steve had accumulated records of many instances where ERVS clients had committed inappropriate acts while immersed in simulations -- acts that would be serious crimes if committed against real people.

"At the end of each simulation, everything is reinitialized to the original event. The avatars remember nothing about what happened during the immersion," Errett said, repeating the official propaganda line.

"Sure the events are reset. But the avatars are alive, they feel pain and humiliation each time they are tortured, raped, violated."

"Right. Protection of avatars is a moral issue, but you're crossing some powerful people. How many humans have you downloaded to the sand?"

"Hundreds by now. Very smart ones. Many more will follow," Steve said, facing Errett and putting his hand firmly on his shoulder. "Sit down and relax. I'll explain what's going on and what needs to be done."

**Daggett: May 2270**

Team leader Daggett settled into his TIS immersion couch to finalize hookup; the three other members of his team were doing the same. All four of them had
scored in hundreds of different event simulations. But in this simulation, ironically called "The Picnic," none of them had succeeded in their first two immersions.

Typically, the team would be assigned a victim, a young female, attending an event. The strategy, always the same so far, was for the team to appear at the event, lure the girl to the perimeter of the simulation and rape her. Each team member had to have a go at the assigned victim, their avatars had to survive until the termination of the session, and the victim had to be alive when they were pulled from the scene. Within these basic constraints, scoring was complex and based on initialization states and historical records of other teams.

The Picnic was unique in their experience. Daggett had studied the ERVS sample simulations with an experienced eye. The assigned victim, Amanda Bishop, was on the original list of attendees but never appeared in the sample simulations. She had to be there somewhere, but where?

There were only three possible hiding places for Amanda: under the grandstand or under one of the two speaker tables. Checking under the grandstand had been time consuming and ended the team's first immersion. She wasn't there. In the second session, they verified she was not under the speaker table to the left of the grandstand, but the search had attracted enough attention to force an end to the session.

Only the speaker table to the right of the grandstand remained as a possible hiding place for Amanda. If she were under that table, there would be no hope of getting her to the perimeter, but also no need. She would be trapped, and they could take her one at a time under the table, shielded by the blaring music.

Four athletic looking young men, handsome, nicely dressed stood at the edge of the picnic grounds. They looked across the lawn at the speaker table. Some college age boys were standing nearby, but no Amanda in sight. The four virtual visitors slowly worked their way in the direction of the table.

**Amanda Arrives: July 2270**

Alarmed by the silence, Amanda listened, parted the cloth, and peeked out at a vast lawn. A small group of people approached the table. They began to shout and applaud.

"It's Dr. Bishop!" someone yelled, "She made it safely." A tall elderly man approached, smiled, and offered her his hand.

"Welcome, Amanda," he said, motioning to the others to gather round. "We're all admirers of your work and pleased to have you join our group."
Amanda looked them over -- all strangers. What were they talking about? Her only work was her Ph.D. dissertation and related papers. She tried to speak, was interrupted by more applause, and then managed to get some words out.

"Thank you, but where are my parents and the rest of the people?"

A young man stepped forward. "Your parents and the rest are fine," he said. "Dead, but fine."

Amanda gasped and held tightly to the table.

"Dead? Why?"

A matronly lady approached and put her arm around Amanda's shoulder.

"Now, now dear." she said, in a soothing voice. "Kevin is a great computer scientist, but he's terribly blunt. Your bio-parents lived a long and productive life and died of old age. This is July 15, 2270. You crawled under the table 160 years ago."

Time travel? Amanda took a few steps back from the group. As a graduate student she had decided time travel was impossible.

"Silence everyone! This isn't how we planned to greet Amanda," the elderly man said, now introducing himself as Dr. Robert Errett. "Come with us, Amanda, we have a small reception with food and drink waiting for us. It's in the building across the lawn." He motioned off to his right.

Amanda looked across the lawn at a Spanish style building.

"We've duplicated the fried chicken and potato salad from your picnic -- dishes that were gone when you finally got out from under the table," Errett said, as they arrived at an outdoor patio buffet.

Amanda gratefully accepted some lemonade and worked her way through the admiring crowd to where the blunt speaking Kevin stood alone.

"What's going on, Kevin?" she asked. "You don't mince words. Give it to me straight."

"Think of yourself as Amanda(A)." Kevin said, with a mischievous grin.

Amanda got it. She looked at the tile floor, the people, and the beautiful clear blue sky. She looked at her half empty glass of lemonade. It tasted great.

"So this is a simulation," she said. "It all seems so real. Ramon(B) is certainly dead, but what happened to Ramon(A)? Not that I want to see him."

"Dragged to the trash long ago. He was an old version, even older than you."
Amanda was offended. "I seem to be just as functional as the rest of these folks," she said. "In what way am I out of date?"

"You're not out of date as an avatar. The process of extracting you from the picnic simulation automatically updated your data structures to modern standards -- you're still a fine personal avatar for the original bio-Amanda. You're our oldest successful extraction."

"Was I copied or extracted? Which is the better word?"

"Copied is better. The original Amanda still has a personal avatar at the picnic under the table. That avatar, your original copy, is now in great danger."

"What sort of danger?" Amanda asked, suspecting the worst.

"The Immersion Rights Party got control of the government about ten years ago. That was the start of widespread abuse of avatars by groups of gamers. They've just recently discovered your picnic." He fell silent.

"What about my parents and friends?"

"Four gamers, rapists, have fixated on you, Amanda, and ignored the other guests. Search engines show you were at the picnic, but your avatar has never been seen in any simulation. That's the fascination for them."

"Dead, but fine," she said, in disgust. "My family and friends are fine until I get raped, then they're next."

"Actually, your cousin Harvey and two of his friends were injured defending your table during the group's last attack. Harvey will probably be killed next time. This group has never failed four times in a row."

Amanda knew that the simulation would be reset each time the gamers attacked. Poor Harvey would have learned nothing from the previous attacks while the gamers would remember every detail. It was a cruel business, unfair to the avatars.

"Why do people now living ever allow ERVS to record them? Their personal avatars are going to be attacked by gangs for sure."

"All simulated events in the last decade are stored in special, secure archives. ERVS will not allow gamers at them."

"Not allow gamers at them until the price is right," Amanda said, clenching her fists in anger. "So these Immersion Rights bastards have made public all simulations done prior to their coming to power. Your ancestors and my descendants are open to abuse."

"You're a quick learner and a leader, Amanda. That's why you're here."
People in this century must be even dumber than those in the twenty second century, Amanda thought to herself. Not a good sign.

Errett approached them. "You must be tired, Amanda," he said. "I'll show you to your casita so you can get some rest. In the morning, the three of us will have breakfast together and talk." He took Amanda by the arm and started across the lawn toward a small adobe casita surrounded by a pebbled cactus garden.

**Amanda's New Home: July 2270**

Amanda awoke to the increasing light, put on her robe, and walked barefoot across the hard smooth tiles to the window of her small room. She watched as the lawn and building of yesterday's festivities reappeared in stages. When the scene was complete, she saw Kevin and Errett walking across the lawn toward her casita. She put two extra mugs next to the coffee pot and propped the door open. Kevin, followed by Errett, entered.

"Good morning, Amanda," Kevin said. "Sorry about not getting the building and lawn back fast enough. We couldn't launch the scene until we docked our motes, and then we had some problems of our own doing. We're still learning."

"Steve is experimenting with us in his ERVS lab," Errett added. "That just makes our job more complicated. Let him have his fun. We'll be free of him soon."

"OK guys, what's going on?" Amanda said, sipping her coffee.

"This screen is where you will learn to navigate your mote," Kevin answered. A large central screen showed three tank-like ellipsoidal shapes huddled together on a black surface. Stubby appendages appeared from their sides. "Meet the sources of our existence. One mote for each of us."

"They look like water bears," Amanda said, remembering her biology class.

"They're about the same size and are on a cryo plate. We're at minus fifty Celsius, better get your coat!"

Amanda got the idea. "So my mote alone can't simulate anything besides me and my casita. The lawn and building required all three of us. Fascinating! Alone in my casita, I exist in my mote. Now I exist in the combined resources of all three motes."

"The fiesta yesterday required all of our motes, clumped in a misshapen ball in Steve's lab," Errett added.
Amanda knew she was a virtual being, a personal avatar of the long-dead bio-Amanda, but she and her mote together constituted a real, physical being in the year 2270. She felt a sense of power.

"With these motes," she said, more to herself than to her companions, "we can kick some butt."

**ERV5: July 2270**

The "real" Errett, as he had come to call himself, entered Steve's lab, shut the door, and approached the figure huddled over the binocular microscope.

"I separated these three motes from the rest. Now they've docked on their own," Steve announced.

"I suppose my mote is one of them," Errett said. "You like to torture him."

"Your mote is one, Kevin's is the other. Amanda's mote is the third, but she doesn't know how to control anything at this point. I like to think I'm challenging your avatar, not torturing him. Take a look."

Errett sat down and looked in the microscope. The display indicated that all three avatars were controlling their motes. "Now they're undocking, one mote is moving backwards."

Steve pushed Errett aside. "That's Amanda's mote. They must be giving her lessons. That's great!"

Errett suspected Steve was underestimating the avatars. He had assembled a team of the best and most creative computer scientists, engineers and hackers from over the last hundred and sixty years. Some, like the newly acquired virtual Amanda, were not aware of the discoveries that had made them important historical figures. Virtual Amanda would not repeat her historical discoveries -- she would learn about them from the other avatars. But the same genius that guided her historical work would be applied to her present situation.

"I'm having trouble controlling them," Steve admitted. "Amanda's mote is new so I was able to initialize her clock speed to ours. Never again, I'm afraid. She's going to run the show from now on."

Errett knew that the motes and Steve's collection of avatars were going their own way. When the motes physically moved, they could be observed with the proper equipment. When they were linked together in a wireless network, they controlled their own complex simulated worlds.
"You're about to lose control completely," Errett said.

"Not completely. I have your avatar and a few others who will represent our interests. Eventually, I'll insert my own personal avatar."

Steve was reluctant to insert his personal avatar into a mote. Why? Errett had his suspicions.

"The one thing that unites these avatars is their hatred of the bio-human gamers," Steve said. "Their best strategy is to screw up the gamers in the most subtle way possible. They need to do the maximum amount of damage while attracting the least amount of attention -- before anybody else but us gets wise."

"You know that, I know that, but will the avatars figure it out?" Errett asked. "We're not going to have much say about their strategy."

**The Fourth Try, TIS: October 2270**

Daggett and his team assembled at the Total Immersion Salon. His confidence was contagious. "We'll kick the shit out of this asshole, Harvey, and finish Amanda this time. I'm ready to move on. This so called 'Picnic' is nothing but bad luck."

He had paid extra to TIS so he and his team members could go under in the same room. It was, he knew, a stupid superstition. As long as they were immersed at the same time, being in the same room was unimportant.

The four men gathered together, held hands, shouted "Go get um," three times, and moved to their immersion couches. TIS technicians, scantily clad girls all with medical training, welcomed them smilingly. The meticulous hookup took twenty minutes. They relaxed together for five minutes, a barely audible buzzer sounded, and the men drifted under.

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Daggett and his team stood silently at the edge of the picnic grounds. ERVS initialized each simulation at some time chosen at random from the first five minutes of the original event. Amanda had managed to hide within a few seconds of the start of the original picnic, making it highly unlikely that Daggett and his team would ever arrive early enough to catch sight of her. But now, after three attempts, they knew where she was hiding.

Daggett checked his small but effective stun gun. Harvey, if he tried to stop them, would get a full blast in the throat -- he'd never make a sound. But, Daggett's team would lose points for stunning Harvey; finesse mattered. For the team to score the maximum, each of them had to get a turn at Amanda and get the hell out of there with a minimum of interference in the rest of the event.
Harvey and his friends, unbothered by the blaring music, stood near Amanda's table just like in the last game. Distracted by a pretty girl standing at the edge of the picnic grounds, they started to move in her direction.

Daggett stood still for a few minutes, sensed the time was right, nodded to his teammates, and started toward the table. Suddenly, he stopped and looked down. He reached for his crotch, felt around, gasped, doubled over, and fell to the ground. His teammates, leaderless and terrified, froze. Harvey and his friends were running in their direction.

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Dr. Mendoza, informed immediately of what happened in the simulation, was the first to reach the writhing, semi-conscious, Daggett. She called for help. A giant technician arrived in seconds and pulled back Daggett's arms and hands, forcing them away from his crotch. He pulled back the sheet that had been placed over Daggett's lower body. Everything seemed intact. Daggett was going into shock.

The TIS supervisor arrived at the scene. "He's going to live. If any of you breathe a word of this, you're fired. Get these other three guys out of immersion and keep them occupied while we get Daggett straightened out."

Dr. Mendoza remained silent. She had never seen anything like this. How would TIS cover up such a mess? The three other team members, less traumatized than Daggett, would remember their virtual experiences and surely tell what happened -- unless they were too embarrassed to reveal the details of yet another failure.

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Steve had watched the virtual picnic through his hacked links to the ERVS simulators. He had penetrated ERVS security, but not the TIS computers or event recorders. The ERVS side was enough to infuriate him -- he knew immediately what had happened. "Amanda was a mistake! She's going to ruin everything."

Errett heard Steve shouting and rushed to the lab. Virtual Errett and Kevin had warned him that Amanda was up to something, but they refused to say what it was.

"She could have cut off anything else," Steve shouted. "A finger, an ear, a toe, that would have been bad enough. Daggett needed his index finger to fire the stun gun. Why not cut that off? Why this? This will trigger a full ERVS investigation."
"Calm down, Steve, you're losing control. You're the one that's going to blow it," Errett shouted, grabbing him by the shoulder and shaking him. "Kevin and my avatar knew what she was up to. They had their doubts, but went along with it. They're no fools, neither is Amanda."

"You knew about this and didn't tell me?" Steve asked in disbelief.

"Only vaguely, they didn't confide details. I think I understand what Amanda is thinking."

"Let's hear it, then!"

"These gamers would die a horrible death before complaining about this to ERVS. Their macho egos will keep them silent. As for TIS management, they're scared to death. Their system creates the virtual gamers, the ERVS computers only play host. If this gets out, the other gamers won't come near the TIS salon out of fear of the same mutilation. Amanda's got them all by the balls."

"Please don't use that phrase," Steve said, regaining his composure. "Maybe you have a point. But, she can't get away with this more than once. Have virtual Errett talk some sense into her."

"I've pretty much lost any credibility with virtual Errett," Errett said, with more relief than sadness.

**The Journey Begins: January 2271**

Errett sat in his office where he had spent New Year's Eve alone. He had been drinking. Amazingly, neither he nor Steve had been fired. In fact, ERVS and the world were still clueless about what was happening.

His first fateful decision came last August when he approved converting all of the sand to the newest model of motes. This decision resulted in the purchase of the new field repair kits. The new kits were miniature fabrication factories capable of repairing or manufacturing new motes under any field conditions. The humanized motes had learned how to operate the fab kits. Within two months, there were hundreds of Amandas, Kevins, Erretts, Steves, etc.

After Amanda's dramatic initialization castration of Daggett's personal avatar, only minor "initialization problems," or IPs as they came to be called, occurred during gaming sessions: a shoe missing, no pants or shirt, slightly odd skin coloration, memory impairment, etc. The accepted explanation for these minor abnormalities was that the legacy systems used by the gaming salons needed replacement. Minor IPs, however, were enough to bring immediate attention to gamers as they immersed themselves in events. Few attacks were successful.
The news of the evening had an ominous note: an automated unmanned cargo ship bound for Mars had mysteriously veered off course, heading north, out of the ecliptic at a slight angle. Officially, the ship carried millions of new motes and a large supply of the latest fab kits. Unknown to authorities, millions of humanoid motes with all the equipment they needed to make many millions more were headed somewhere. But, where?

Errett thought of the Kuiper belt. Slowly rising above the ecliptic, they would avoid all interplanetary traffic and eventually end up on some scattered Kuiper belt object with a high-inclination orbit -- cold operating environments for their computers and enough matter and energy to sustain them indefinitely.

Errett finished his wine and poured another glass. He was fading. He felt jealous of the virtual Erretts. They and their evolving civilization would essentially last forever. They could travel the galaxy without concern for the passage of time. They would evolve in the Darwinian sense under the dangers of space travel. Likewise, they would improve their own computer technologies and hence their own individual life forms, evolving in the Lamarckian sense. They could live near the center of the galaxy or in the outer reaches. All they would need is matter and energy under a wide range of conditions -- very different from the limited possibilities for bio-human habitats in space.

Errett staggered to his office couch. What would be the purpose of their civilization? They would need a purpose. The study of the natural history of the galaxy, its life forms and their struggles to survive would be complex enough to occupy the talents of the mote civilization for the long haul. If this concept of purpose occurred to him, it would also occur to the many virtual Erretts. Comforted by this thought, he fell into a sound sleep.

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