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BRING ME THE HEAD OF PHILIP K. DICK

HOW A CREATIVE TEAM OF SCIENTISTS AND ACADEMICS FROM MEMPHIS
CREATED — AND LOST — AN ANDROID SUPERSTAR.

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[ABOVE] PHILIP K. DICK AS ANDROID; [RIGHT] ANDREW OLNEY OF THE UNIVERSITY OF MEMPHIS, ONE OF THE BRAINS BEHIND THE SCI-FI ROBOT SUPERSTAR

In December 2005, renowned roboticist David Hanson caught an early-morning flight from Dallas to Las Vegas. He was carrying a head in a duffel bag. Hanson was coming off a few whirlwind months, during which he had displayed his “android” creation to thousands of admirers in the scientific — and science-fiction — communities. Now, he was off to demonstrate its capabilities at the booming Google campus in California. Hanson was exhausted, and after storing his cargo in the overhead bin, he promptly dozed off.

The head belonged to Hanson’s most ambitious project, an android re-creation of science-fiction author Philip K. Dick. It represented thousands of hours of work by a well-regarded but little-known academic institution housed at the University of Memphis. In just a few short months, it became a massive spectacle, capturing the imagination of science-fiction fans across the globe. Seven years later, one of the members of the team at the U of M, David Dufty, is set to release a book about the project, called *How To Build an Android*. But just as quickly as it surfaced, the project that brought Hanson and the U of M together disappeared. Call it the Case of the Missing Head.

THE BRAIN BUILDERS

Along with his interest in robotics, Hanson studied sculpture. He understood the way muscles in the face worked, and his robot faces were incredibly realistic. Though he was a rising star with his creations, he had little experience with artificial intelligence, and a robot without a

brain is just a high-tech puppet.

Enter Art Graesser. Since joining the University of Memphis faculty in the late 1970s, Graesser’s work has been the study of intelligence and the mind. Graesser and his colleagues, Stan Franklin in computer science and Don Franceschetti in the physics department, founded the Institute for Intelligent Systems at the U of M in 1985. Since then, the institute has been a leader in the study of intelligence, in particular, the study of artificial intelligence as it relates to education. One of the institute’s most successful projects was an educational computer program called Auto-Tutor.

Auto-Tutor was a groundbreaking experiment in how artificial intelligence (AI) could be tailored to education. The program attempted to create a working personal tutor. Though the idea of a computer program designed to improve education seems almost quaint now, Auto-Tutor was among the first and most refined of its kind.

At the Cognitive Systems Workshop in 2003, Graesser saw Hanson present his latest creation, a robot head called “K-Bot.” For K-Bot, Hanson had created a new android skin called “Flubber.” The skin, combined with Hanson’s experience as a sculptor, created a remarkably lifelike android face. Impressed, Graesser approached Hanson about collaborating.

In the summer of 2004, Hanson brought an updated version of K-Bot, called “Eva,” to Memphis to visit the institute in its new offices at the FedEx Institute of Technology. During his demonstration, Hanson met

Andrew Olney, a talented young programmer working on his Ph.D. in computer science at the U of M. Olney had left Memphis after high school to study cognitive science at University College in London and adaptive systems at the University of Sussex before returning to settle in the Mid-South.

Also among those gathered to see the lifelike robot was David Dufty. Dufty was doing post-doctoral work under Graesser at the University of Memphis at the time and is currently working in the national statistics office in his native Australia.

“It was Hanson who had the original idea of creating an android likeness of Philip K. Dick,” Dufty said. “The very idea of using his likeness in a complex android is brilliant. It was undeniable that this would capture the imagination.”

MORE HUMAN THAN HUMAN

Philip K. Dick was one of the most influential science-fiction writers in history. He wrote prolifically until his death in 1982 — completing 41 novels and 121 short stories. To date, eleven of his works have been adapted for film, including *Total Recall* and *Minority Report*. Dick was the first science-fiction author added to the collection of the Library of America.

In *Do Androids Dream of Electric Sheep?*, later adapted into the film *Blade Runner*, Dick created a world in which androids were indistinguishable from humans. The androids themselves could be programmed to believe they were human. The University of Memphis group knew that creating an android of Dick would titillate science-fiction fans and push the bounds of what the young and talented crew could accomplish.

The team in Memphis agreed. The institute would build the brain, and Hanson would provide the body. Graesser put Eric Mathews, on his way to becoming the associate director of the FedEx Institute, in charge of the joint project.

Mathews began to look for a way to pay for the project, and after a few unsuccessful attempts at funding, convinced the FedEx Institute to invest \$30,000 to build the android, a modest amount for a project of this complexity.

To make the android even more realistic, the team wrote some of Dick’s dialogue into a customized program, using the transcripts from hundreds of interviews and his many works of literature. The creation was not a puppet, however; the android had to be able to respond to questions on its own.

Though Olney is proud to talk about his involvement with the project, he’s still a bit surprised that it garnered so much attention. “A lot of the conversational stuff with the robot wasn’t that interesting,” Olney said. “What made it interesting was that it was Philip K. Dick. It had this



PHOTOGRAPH OF ANDREW OLNEY BY JUSTIN FOX BURKS

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resonance.”

Olney describes the program as basic, but Mathews suggests Olney is being modest.

“People don’t understand how complex the problems are,” Mathews said. “This robot listens to you; it then has to convert that speech to text. It then it has to parse the dialogue, pump it through a series of dialogue rules, and respond naturally.”

The android had two modes. A “chat bot” mode, which was essentially an interactive, scripted mode. The android was regularly asked, “What are you?” and the robot would respond, “I am Phil, a male Philip K. Dick android electronic brain, a robotic portrait of Philip K. Dick, a computer machine.”

The other mode was as much art as science. Using the massive transcript records, Olney’s program would look for keywords and context clues to formulate answers to the scientists’ questions. The android would then answer without prompting, which would occasionally spin the android into semicoherent ramblings that seemed nearly human.

“There was a dimension to it that was really authentic,” Olney said. “We have a video of this one conversation where we’re talking to the robot about religion. There’s a hilarious conversation, because they won’t let up, and they won’t change topics. Some of the stuff it came back with was surprisingly plausible.”

Dick’s own children witnessed this firsthand. Because of copyright concerns, Hanson asked the Dick family for its blessing, even promising the author’s daughters that they would have the right to kill the project if they didn’t like what the team created. Just a few days before the robot was set to be unveiled, Isa Dick visited the FedEx Institute.

“She had a moment with this robot that could’ve been a deal breaker,” Mathews said. “We didn’t know what it was going to say or how she’d react to talking to her robot father.”

Years later, Isa Dick told a reporter from the *Los Angeles Times*, “It looked very much like my dad. When my name was mentioned, it launched into a long rant about my mother and this one time that she took me and left him. It was not pleasant.”

Still, Isa Dick approved the project.

Later, the president of the University of Memphis, Shirley Raines, dropped by the FedEx Institute for a chat with the artificial author.

THE ANDROID INTERJECTED: “ARE YOU A MAN OR A WOMAN?”

President Raines: “I give you credit for your work. I’ve noticed that . . .”

The android interjected: “Are you a man or a woman?” Raines pressed on: “I am definitely a woman.”

“Me too! I am a she.”

“I am the president of the University of Memphis.”

“I knew he was president, but I never knew of the University of Memphis.”

“I like your blue eyes.”

“I haven’t heard anything like that before.”

“It’s a compliment.”

“Do you have any conditions I should know about?”

Olney stepped in and stopped the interview before the android went off on another tangent.

THIS ARTIFICIAL WORLD

The robot body was to be melded with the brain less than a week before the unveiling at *Wired* magazine’s 2005 NextFest. *Wired* promoted the event as an attempt to re-create the excitement of a historic World’s Fair, and the android was featured on the cover of the event’s program.

The conference environment presented its own set of problems. The robot’s ears — advanced microphones in the head — had to be finely tuned so it could tell when its questioner was finished speaking. Despite a headset to cut down on ambient noise, the team worried that the loud

conference floor at NextFest would confuse the robot.

Mathews enlisted the university’s theater department to construct a soundproof room designed to look like Dick’s 1970s California bungalow. The Dick family donated some of the author’s personal effects to add to the experience.

“It even had shag carpet,” Mathews said, “and Dick’s Linda Ronstadt records.” The room’s authenticity added both another level of artistry and a massive headache to the project.

“This thing had to be shipped to Chicago from Memphis,” Mathews said. “There were so many points of possible failure for the project. I think we only really had about two months to make it all happen.”

Noise, heat, and thousands of visitors made the convention stressful, but for the U of M team and the Philip K. Dick android, it was a massive success.

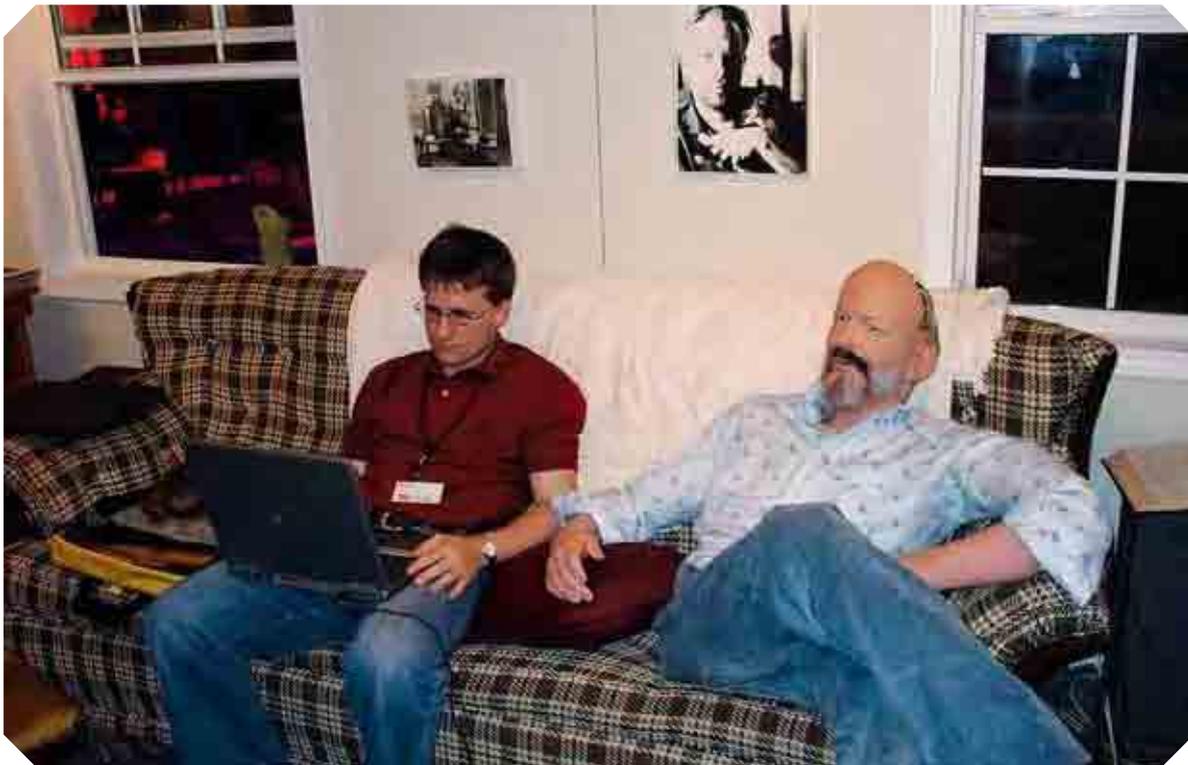
“People waited hours to talk to it. The line would extend across the whole conference floor. We had to pack them in,” Mathews said. “Every 45 minutes we’d have to stop the line and open all the windows for about 15 minutes to let Philip K. Dick cool down.”

Journalists worldwide wrote about the android, turning David Hanson into a rock star in the world of robotics. Oddly, the University of Memphis team got very little press for its contribution.

Though the re-created room wouldn’t be shown again, there were already plans for the android to make a few more showings, including an appearance at an academic conference and then on to Hollywood.

Filmmaker Richard Linklater, perhaps best known for his film *Dazed and Confused*, was at Comic-Con promoting *A Scanner Darkly*, the latest Philip K. Dick movie adaptation, and Hanson (without Olney) agreed to have the android on the panel along with some of the filmmakers. Without





(ABOVE) ERIC MATHEWS AND FRIEND; (FAR LEFT) PHILIP K. DICK'S "BUNGALOW"; (NEAR LEFT) ANDREW OLNEY MAKES SOME ADJUSTMENTS

his soundproof room or Olney to tweak the software, the android made an underwhelming appearance at Comic-Con. Despite the rambling performance, the producers of *A Scanner Darkly* hoped to have the android answer questions at press junkets promoting the film.

One last showing was scheduled: a command performance for the employees of Google. Olney and Craig Grossman, the new director of the FedEx Institute, made the trip along with Hanson to avoid a repeat of the android's rambling Comic-Con appearance.

THE MISSING HEAD

Hanson fell asleep en route to the Google campus and, bleary-eyed, rushed off the plane in Las Vegas to make his connecting flight to California. It wasn't until he boarded his next flight that he realized he'd left the head behind. The head was found and put on a flight to meet Hanson, but it never arrived.

A few weeks later, word of the missing head made it to the media, and once again, Dick's android captured attention. *The New York Times* called it "A Strange Loss of Face, More Than Embarrassing," and it even garnered

attention from Middle Eastern news service Al-Jazeera. The android's appearances promoting *A Scanner Darkly* were canceled, and hundreds of hours of work were lost. In less than a year, the android of Philip K. Dick had caught the imagination of the science and technology world and then had been lost forever.

For a few weeks, Hanson held out hope that the head would turn up. When it didn't, he sued the airline, and, though he lost, the judge's science-fiction-laden decision was almost worth the trouble.

"The Court must GRANT Defendant's motion, but does so hoping that the android head of Mr. Dick is someday found, perhaps in an Elysian field of Orange County, Dick's homeland, choosing to dream of electric sheep."

David Dufty, in his quest to complete his forthcoming book, visited a central depot for lost baggage in Alabama without success. As time went by, it became clear that the head would remain lost.

While it would have been possible to rebuild the android, the cost and time commitment were beyond anyone's interest. Hanson was ready to move on. Olney came back to Memphis to defend his dissertation.

Hanson's next project was a collaboration with Korean roboticist Jun-ho Oh. The joint venture was another iconic melding of robotics and art: the head of Albert Einstein perched atop a small white astronaut-like robot named

Albert Hubo. It famously shook hands with President Bush in 2005 at the APEC summit in Korea.

After graduating from the U of M, Mathews became the CEO of Launch Your City, Inc. and the interim director of Emerge Memphis, spending his day building high-growth-potential start-ups.

In the seven years since the android was built and lost, Olney has remained in Memphis, becoming assistant director of the Institute for Intelligent Systems. His fascination with robotics hasn't diminished. Along with the android's software, his personal website shows many other robot projects, including a hacked Billy Bass, a Tickle Me Elmo designed to do basic tutoring, and a project Olney calls "R2."

He began R2 in 2008 in his spare time as an ongoing project. The title "R2" has a double meaning. The first is homage to the beloved *Star Wars* character R2-D2. The second?

"I'm actually building a robot of my wife, Rachel," Olney admitted with a chuckle. "How could she be mad at me for spending all this time working on a robot of her?"

The Institute for Intelligent Systems at the University of Memphis has grown steadily, earning millions of dollars in research funding and completing dozens of projects around the U of M campus. The descendants of Auto-Tutor continue to be adapted for various educational situations, though no project has garnered the attention that the Philip K. Dick android received.

WE CAN REMEMBER IT FOR YOU, WHOLESALE

In Philip K. Dick's fictional world, reality was always subjective. He published his novel *Flow My Tears, the Policeman Said* to high acclaim in 1974. The novel is set in a dystopian future in a totalitarian state. A massive identity database called Pol-Dat, where individual identities can be stored and copied, controls the population's every move. In a crucial moment, the protagonist, Jason Taverner, is on the run from the police and uses the giant database as an opportunity to claim a new identity and escape. Dick wrote:

"He thought, Thank God for the weaknesses built into a vast, complicated, convoluted, planetwide apparatus. Too many people; too many machines. This error began with a pol inspec and worked its way to Pol-Dat, their pool of data at Memphis, Tennessee."

Sometimes fiction is stranger than truth. ■



PHOTOGRAPHS
COURTESY OF
ANDREW OLNEY

