



Futurama Drama

Computer scientist David Lu '07 (T5) uses theater to explore the evolving relationship between humans and robots.

By Sofia Tokar

David Lu '07 (T5) has not yet seen *Westworld*, HBO's hit television series in which android hosts populate a Wild West-themed park and cater to the whims of human guests. Lu's omission is notable, given his billing as chief robot programmer in the spring 2015 theatrical premiere of *Sky Sky Sky* by Liza Birkenmeier.

The play, like *Westworld*, raised questions about artificial intelligence, hu-

HUMAN TOUCH: Roboticist David Lu '07 (T5) helped program *Harris T. Robot*—a central figure in the play *Sky, Sky, Sky* (above, in a scene with actress Nancy Harris)—as part of his PhD work on how robots interact with people.

man-robot relationships, agency, and autonomy. But unlike the TV show—which features human actors playing robots who think they are humans—one of the play's main actors was, in fact, a robot.

Dubbed Harris T. Robot, it was a PR2 model, a common robotics research platform that runs on the open source robot operating system (ROS) and is used by countless industries, universities, and companies. About five feet tall, weighing 400 pounds, and with two arms, PR2 is not exactly Anthony Hopkins. Still, Lu believes that the performing arts, especially theater, offer a way to explore the potential to enhance human-robot interactions using current robotics technology.

“With theater, we can construct controlled scenarios and put the robots in, al-

lowing them to participate in much the same way human actors do,” he says. The job of professional actors, after all, is to convince others that they are something they're not. Using acting techniques, might robots convince people that they are social, or even conscious?

“If I'm in a production of *Hamlet*, I can't actually change myself into Hamlet. But I can do everything in my power to make my actions look consistent with those of the Prince of Denmark,” says Lu. Maybe it's the same thing with robots. “We can't get robots to be real, human-like, emotional creatures, but within the scope of theater we can have them perform actions that make it seem to the audience as if they are.”

Sky, Sky, Sky was the result of a six-year collaboration between computer scientists

and performing artists (including the play's director, Annamaria Pileggi) as part of Lu's PhD work on contextualized robot navigation at Washington University in St. Louis. Set in 2061, it centers on a character named Joan, an older woman who suffers a heart attack and needs the assistance of a robot as her medical caregiver.

Lu believes there is also something special about using real robots in live theater, as opposed to digital droids or actors playing robots on screen. "The fact that it's a chunk of plastic with whirring fans and flickering sensors—that part gets a visceral response from the audience."


Understanding that response is a key part of Lu's current work as a roboticist at Bossa Nova Robotics, a Pittsburgh-based start-up that specializes in building robots that work around people. Lu programs robots that scan the shelves of large grocery and retail stores to track what's out of stock.

"Like the theater work, it's all about how people perceive the robot," he says. "This robot is in a store with people who had no idea they were going to see a robot that day. Every move that robot makes is going to have broad implications for what people think of robots from then on."

Most robots, for example, are programmed to get from point A to point B in the most efficient manner, even if there's a person in the way. Whereas humans understand the concept of personal space, most robots are not concerned with such decorum. Lu's work entails programming robots with contextual information to improve human-robot interactions. "The idea of being able to help shape people's impressions of robots is really what drives me," he says. "I want people to not be afraid of robots. They're completely harmless."

Could Harris T. Robot be a gateway to Wall-E, Skynet, or other fictionalized versions of self-aware artificial intelligence?

Lu demurs. "There's no greater intelligence in these robots. I might personify my robots, but I'm under no false pretenses about their abilities."

Instead, when it comes to robots like PR2, Lu likens himself to a stage parent: "I'm not the one on stage, but I am making sure that [the robot] does well—and when it screws up, that reflects on me. But if it succeeds, then I can sit back proudly." 



PENNSYLVANIA'S 50TH: Josh Shapiro '95 (right) takes the oath of office as Pennsylvania's 50th attorney general while his wife, Lori, and children, Sophia, Jonah, Max, and Reuben, look on.

Taking the Oath

Alumni are sworn into new elected offices this year.

Josh Shapiro '95

Pennsylvania Attorney General

A native of Abington, just outside Philadelphia, **Josh Shapiro** '95 has moved steadily upward to higher and higher offices since his first election, as a member of the Pennsylvania House of Representatives, in 2004. In January, he became the 50th attorney general of the state of Pennsylvania.

Shapiro served three terms in the legislature representing the district that includes his hometown. Then, in 2012, he sought and won election to the Montgomery County Board of Commissioners. A Democrat, he defeated Republican State Sen. John Rafferty, whose district includes parts of Montgomery County, in last November's race for attorney general.

A political science major at Rochester, Shapiro got his first taste of legislative politics as a participant in the political science department's Semester in Washington program. That experience led him to return to Capitol Hill after graduation, where he eventually became the chief of staff to Rep. Joe Hoefel of Pennsylvania.

Tony Vargas '08

Nebraska State Senator

In January, about the time he was taking the oath of office as a Nebraska state senator, **Tony Vargas** '08 was also accepting an award from the Omaha Jaycees as one of Ten Outstanding Young Omahans. The award, which honors community service and professional development, underscored the growing importance of Vargas, a native of New York City, in Nebraska's largest city.

The son of Peruvian immigrants, Vargas studied psychology at Rochester and gained research experience in the lab of Jack Werren, the Nathaniel and Helen Wisch Professor in Biology. He began his professional career teaching science in a New York City public school for Teach for America. His work with the nonprofit led him to Nebraska, where he worked on teacher support and development for Teach for America, before becoming a policy analyst for an Omaha educational consulting firm and a member of the Omaha School Board. Last fall, he accepted a new position, which he retains while serving in the senate, as marketing and communications director for Omaha Healthy Kids Alliance.

A Democrat, Vargas defeated Republican challenger John Synowiecki last November. Vargas is the only Latino serving in Nebraska's unicameral legislature.

Mary Beth Walsh '87

New York Assemblywoman

Mary Beth Walsh '87 is a lawyer in private practice, where her work has been focused on advocating for children in Family Court. Before winning a seat in the New York State Assembly in November, she served on the Ballston Town Board and as assistant Saratoga County attorney. A specialist in municipal as well as family law, she's also a board member of the Saratoga County Industrial Development Agency.

Walsh, a Republican, defeated Democratic challenger Michael Godlewski, also a family attorney, in November.