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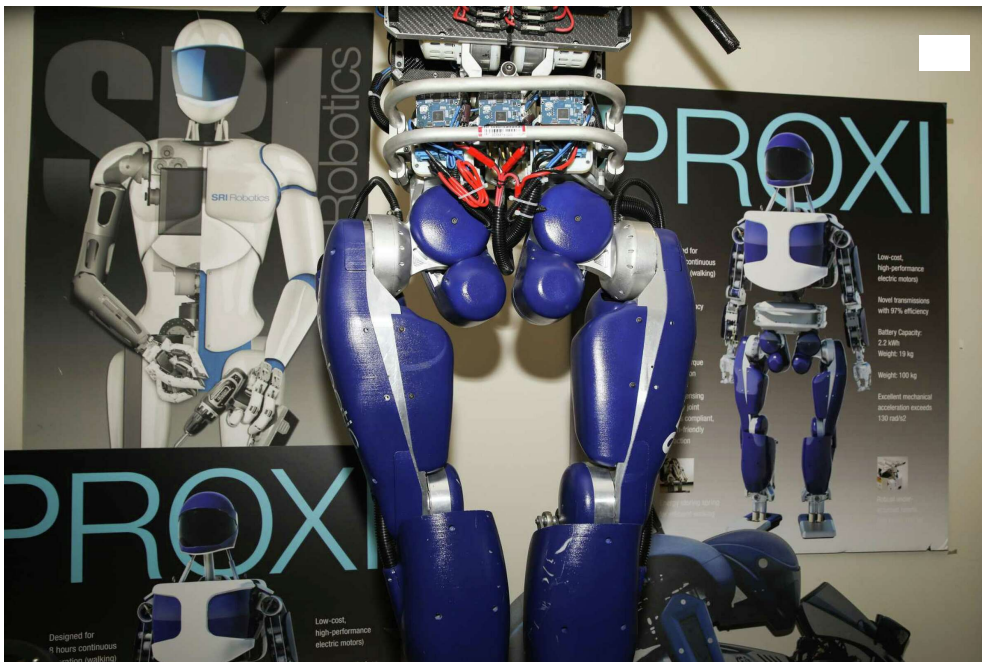
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TECH

# This Bay Area nonprofit was behind Siri and other AI. Here's the 'moonshot stuff' it's doing now

 **Chase DiFeliciano**  
May 8, 2023

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The PROXI humanoid robot is on display at SRI International's robotics lab at the SRI campus in Menlo Park. For decades, SRI has been working on technology that becomes part of our daily lives.

Juliana Yamada/The Chronicle

What if there was a company in Silicon Valley that was already years into applying generative AI technology to real-world scenarios? It would need investors to throw gobs of cash at it before parading its innovative technology on the world stage,

because that's how innovation works, right?

Not always. A staggering array of the technologies you may be using to read this article — from the [computer mouse](#) to the voice recognition technology known as [Siri](#) and even the underpinnings of the [internet](#) — weren't debuted for investors looking to sink in billions. They were brought to life by a nonprofit situated in an unassuming leafy office complex in Menlo Park called SRI International.

Originally founded in 1946 as Stanford Research Institute, the organization that introduced the rudiments of the [personal computer](#) in 1968 eventually broke away as a renamed nonprofit. Defense spending “is the reason SRI spun off from Stanford ... after student protests against its war work during the Vietnam era,” said Margaret O'Mara, a tech historian and University of Washington history professor at the Seattle campus, in an email

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That work, most of it government funded, continues today in SRI's labs, where the nonprofit explores advancements in robotics, artificial intelligence, space technologies, health research and a host of other areas. The organization has about \$400 million in annual revenue — of which it said roughly 85% comes from government funding — with net assets of around \$200 million.



SRI Robotics Interim Director Alexander Kernbaum handles the Belt Augmented Compliant Hand robot gripper at the SRI campus in Menlo Park. The BACH is able to manipulate objects that would normally need to be handled with fingers.  
Juliana Yamada/The Chronicle

To be clear, SRI isn't alone in these kinds of explorations. Leviathan tech companies like Google and Amazon have "moonshot" divisions that sink billions into researching far-flung and foundational technologies in the hopes they will provide huge returns down the line.

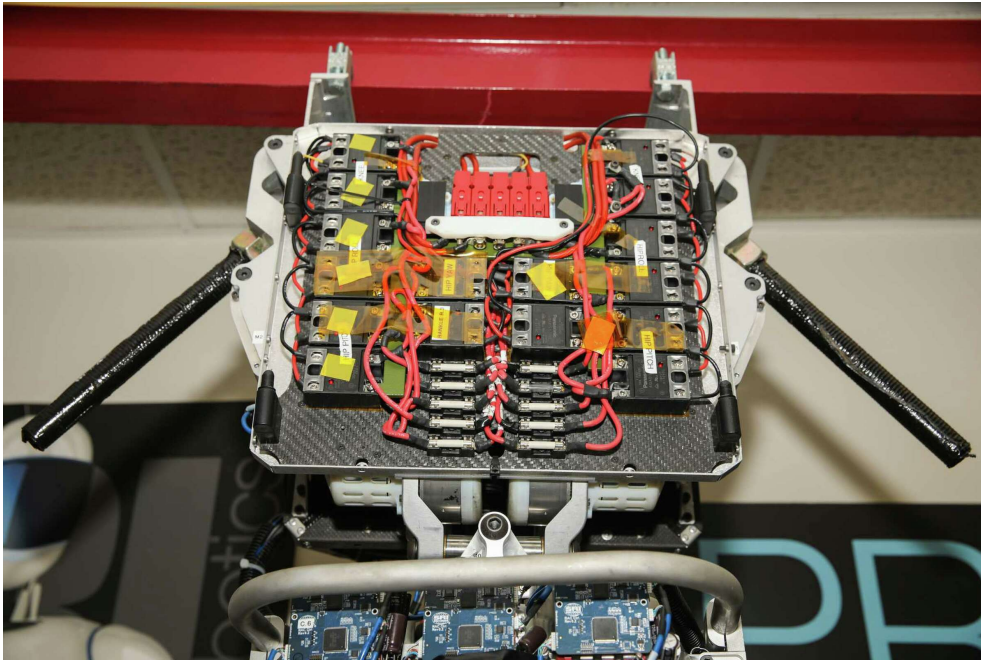
While the private sector's investment in research and development is huge, "the difference is it's very focused because it needs to make business sense," said David Parekh, SRI's CEO. SRI uses a different model, building foundational technologies it can license to outside companies, or that it frequently spins off to become companies of their own.

For instance, SRI's robotics group, alone, has produced seven companies in the past 10 years, said Alexander Kernbaum, the robotics lab's interim director.

One of those inventions is a black mesh exosuit hanging on a mannequin in a lab littered with wires and gears and the other detritus of innovation. It was designed to give the wearer increased muscle strength and to combat fatigue as part of a Defense Advanced Research Projects Agency, or DARPA, a challenge that originally brought Kernbaum to the lab.

[SRI's SuperFlex Suit](#) used motors and actuators connected to the fibers of the suit that run along muscles to augment their flexing power.

Projects like the exosuit, "started out for super soldiers," said SRI Senior Robotics Engineer Reuben Brewer. But those same technologies can also be used for rehabilitation after an injury or stroke, Brewer said.



The PROXI humanoid robot is on display at SRI International's robotics lab.  
Juliana Yamada/The Chronicle

Once the government-funded portion of the project was over, a venture capitalist visiting the lab saw the model and said, “ ‘I’m funding that’ ” Kernbaum said. That is now the Menlo Park company Seismic, which has more than [\\$23 million in venture funding](#) and develops versions of the suit.

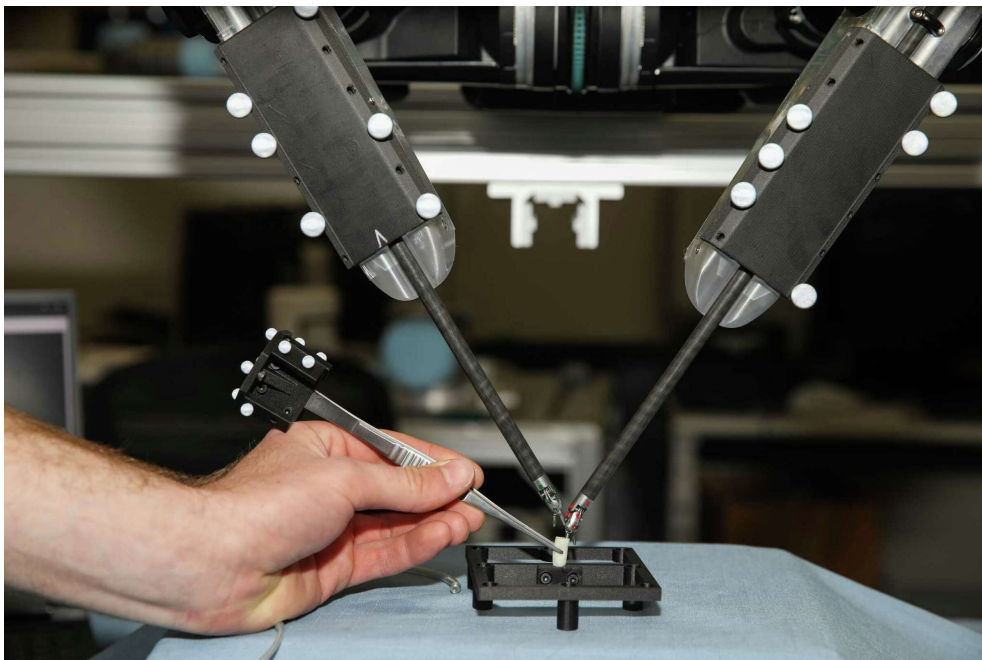
“You’ll see a pattern in the way we work,” Kernbaum said. “A lot of the early research we discover is government funded, the really sort of moonshot stuff” before it finds its way into the world and the everyday lives of millions of people.

Other lab innovations like the [Abacus Drive](#) — a kind of highly efficient rolling gear transmission that can allow a robotic arm, for example, to more smoothly pick up and put down objects — have been licensed out to companies to become part of the next generation of robotics.

What the robotics lab is perhaps best known for was an almost literal moonshot: A telerobotic surgery system originally dreamed up with the help of NASA funding in the 1980s so doctors on Earth could perform emergency operations on astronauts on the International Space Station.

That technology never made it to space, but formed the technology base for the Da Vinci surgical robot and Sunnyvale-based Intuitive Surgical, an S&P 500 company valued at more than \$100 billion.





Nicholas Marion simulates a surgery with SRI's Taurus medical robot at the SRI campus. The robot contains Da Vinci tools with adapters, which allows for precision during surgery.  
Juliana Yamada/The Chronicle

Another example is SRI's sleep lab complete with fully equipped bedrooms for sleep studies run by Fiona Baker, director of the organization's health sciences center and its Human Sleep Research Program.

A focus on how women's sleep and health changes with age led to the creation of another company, [Lisa Health](#), based in Oakland.

While the venture-backed model of tech innovation is often more visible and comes with more marketing hype, many of those truly world-altering technologies were born in these Menlo Park labs.

One area where that has come sharply into focus is with so-called generative artificial intelligence like ChatGPT and Midjourney, which can be used by just about anyone to get fluent answers to queries or to create detailed visual renderings from a simple prompt.

SRI's AI lab had been working with that type of technology for years before it exploded into the public consciousness late last year.



Headphones and electrodes hang on the walls of SRI International's Human Sleep Research Laboratory. Researchers use electrodes to measure breathing, heart rate, brain activity and muscle tone.  
Juliana Yamada/The Chronicle

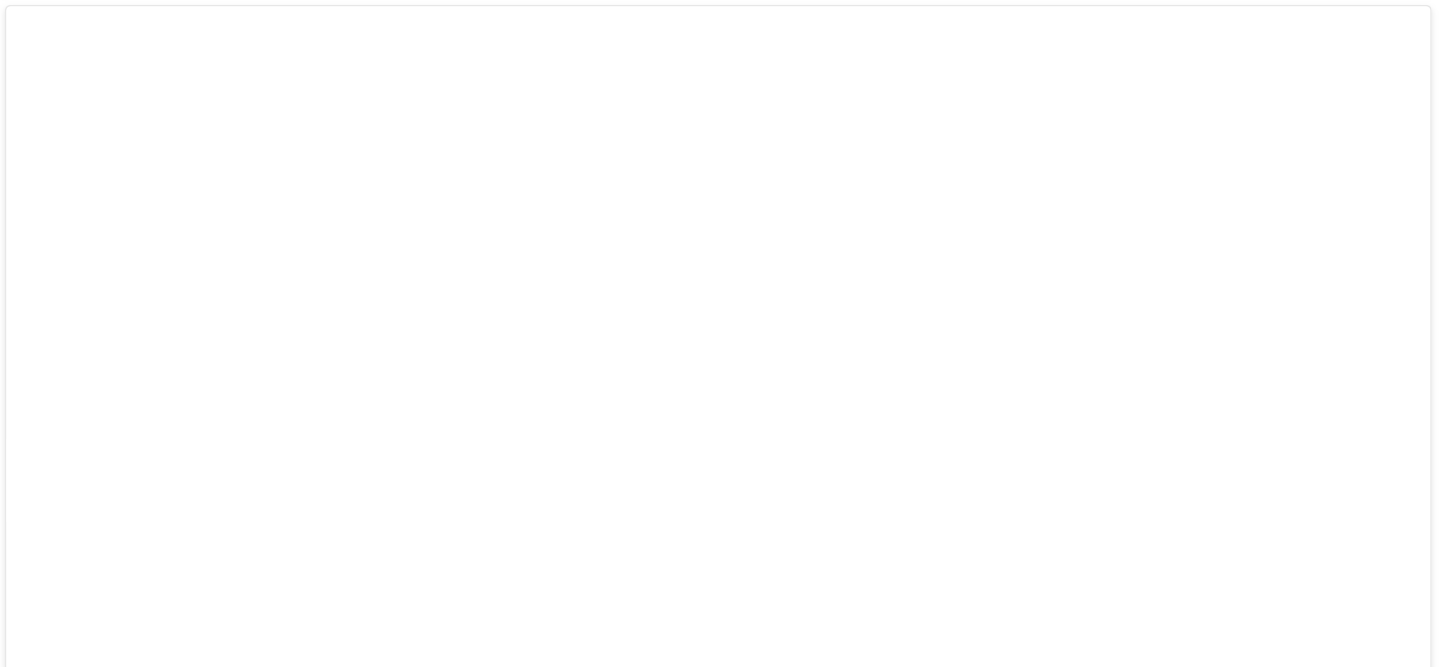
An SRI project with Obayashi Corp., one of the largest construction companies in Japan, and in development periodically since 2019, applies generative AI so that an architect can input a building sketch idea and have a program spit out a range of building design ideas.

Called AiCorb, the program has two components: AiCorb Designer, which converts sketches to images, and AiCorb Modeler, which converts 2D images to 3D structures.

The program hasn't been used to build any real life buildings yet, but makes it much easier to "change the number of floors in the structure, window height and all these things," without having to use complex engineering software, said Anirban Roy, a computer vision scientist working on the project at SRI.

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But instead of replacing architects and designers, “these tools will really be game changers in terms of just broadening ... our scope, getting us to think about things we might not otherwise have considered,” said Karen Myers, the lab director for SRI’s Artificial Intelligence Center.

That includes applications like envisioning buildings with very different shapes, like the Pokémon character Pikachu. Senior AI Center Computer Scientist Eric Yeh did just that, smiling broadly as he dragged and dropped a digital sketch of the cute, rabbit-like creature into the program, causing it to spit out a series of surprisingly believable, albeit eccentric, structures that still bore an uncanny resemblance to the cuddly cartoon creature.

Those exact structures may never be built, but are a use of AI to, like the exosuit, turbocharge human limitations — in this case imagination instead of muscles.



Senior Robotics Researcher Reuben Brewer remotely operates SRI International's Internet Remote Controlled Excavator at the SRI campus.  
Juliana Yamada/The Chronicle

While AI that generates new images and text may be moving at breakneck speed in the private sector, other forms of the technology, like speech recognition, are still on the lab-to-product track.

The virtual assistant Siri, which was created with DARPA funding at SRI and is now standard software in Apple phones and devices, is one example. Another is [IraqComm](#), a translation tool between English and Iraqi Arabic speakers developed for U.S. forces during the Iraq War.

The AI lab is working on evolving the technology so it incorporates a headset that can visualize spoken text between two people speaking different languages. SRI Research Linguist Andreas Kathol demonstrated how the program can be trained to use AI to smooth out prickly social cues and words that may be tame in one language, but offensive in another.

For instance, an English speaker wearing the headset might say “damn,” but the system catches it and does not translate it directly into Mandarin, where Yeh said it would roughly mean, “You deserve death.”

That research comes out of a larger [DARPA](#) program to help U.S. military operators communicate in other countries and languages, but it’s not hard to see how the technology could be just as useful at home in an urban, polyglot setting.

Some of these technologies may be years or decades from sitting in commuters’ palms while they idly wait for the next train. And as Parekh, the SRI CEO, said, huge leaps forward only come about every once in a while.

“I think what has changed in a big way is the access to information, the speed by which we can process it, our ability to connect more broadly. But fundamentally, innovation still has remained the same,” Parekh said.

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