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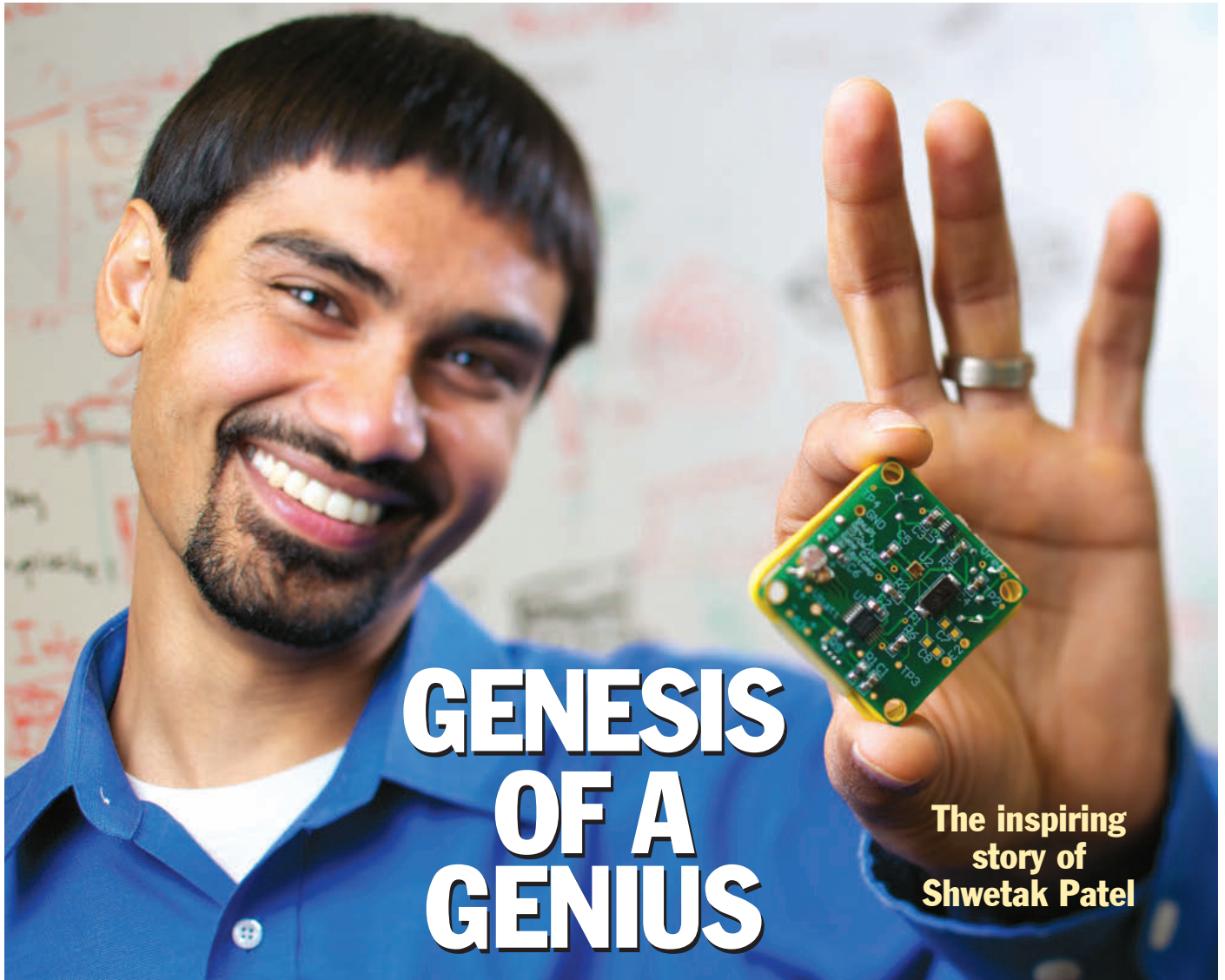
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GENESIS OF A GENIUS

The inspiring story of Shwetak Patel

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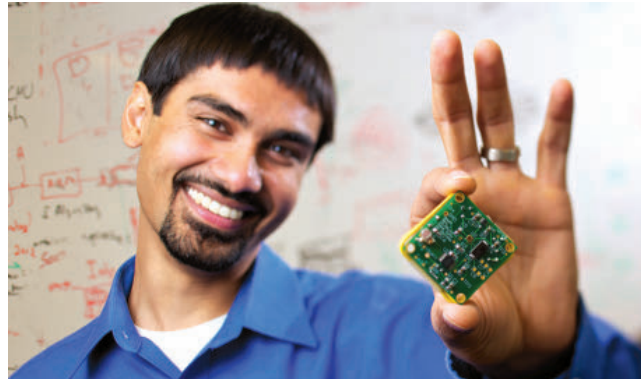


Genesis of a genius

Arthur J Pais profiles new MacArthur Genius grant winner Shwetak Patel

Shwetak Patel is one of the most acclaimed of computer scientists in the United States. Recently named a John D and Catherine MacArthur Foundation Fellow with a \$500,000 no-strings-attached 'Genius' award, the University of Washington assistant professor received the *Technology Review's* TR-35 award in 2009.

He was also named top innovator of the year 2009 by *Seattle Business Magazine*, was honored as newsmaker of the year by *Seattle Business Journal*, and was a recipient of the Microsoft Research Faculty Fellowship in 2011. His work has been featured in *The New York Times* and *Wired*. Few years ago he founded a company called Zensi, Inc, while he was a graduate student at Georgia Tech. Zensi, a demand-side energy monitoring solutions provider, was acquired by Belkin, Inc in 2010 for an undisclosed sum.



"The MacArthur fellowship came as a total surprise, I had no idea that I was under consideration," said Patel, 29.

He had returned from China when the announcements were made. He joins a handful of Indian Americans to win the coveted MacArthur award. Past winners include *sarod* maestro the late Ustad Ali Akbar Khan, poet and literature professor A K Ramanujan and physician and bestselling author Atul Gawande.

Of the 22 new MacArthur Fellows for 2011, whose nominations are kept secret, there is an architect, a sports medicine researcher, a cellist, a developmental biologist, a radio producer, a neurologist, a conservator, a poet, a technologist, and a public historian.

Patel said his guiding principle is that his discoveries should create an impact and make a difference in ordinary lives.

"Dr Patel's most recent research has been in building a new class of low-cost and easy-to-deploy sensing systems for the home, called Infrastructure Mediated Sensing, which leverages existing utility infrastructures in a home to support whole-house sensing," the MacArthur Foundation said. "To allow residents to track their energy usage down to the level of individual appliances and fixtures, Patel's distinctive approach leverages existing infrastructure — such as gas lines, electrical wiring, plumbing, and ventilation ducts — and requires only a minimal number of small, wirelessly connected sensors attached to the central hookup of each of these utility sources."

Patel, the oldest of the three children of Birmingham, Alabama hotel owners Naran and Kusum Patel, is also exploring the sensors' potential for home security or elder care.

The MacArthur Foundation citation added: "Patel devises elegant, simple solutions that dramatically reduce the cost of implementation."

Ed Lazowska, the Bill and Melinda Gates professor in the University of Washington computer science department, told the *Seattle Times* that Patel "is just unbelievably creative. He thinks about this stuff a mile a minute. And he's totally the nicest guy in the world."

Hank Levy, chair of the UW computer science department, who reportedly nominated Patel for the MacArthur, was quoted as saying: "Some people are just born with the curiosity and the ability to invent new things. And he works very, very hard."

Patel received his PhD in computer science from the Georgia Institute of Technology in 2008 and BS in computer science in 2003. Since 2008, he has been at the University of Washington.

Belkin International has announced plans to begin marketing the sensors devised by Patel and his students.

"These sensors," wrote Jeremy Jaech in *Xconomy.com*, "will be able to save the lives of many homeowners, and save insurers hundreds of millions of dollars; water damage claims now surpass fire claims and natural disasters and are very expensive to settle."

Patel, who loves to travel with his wife, computer scientist Julie Kientz, has not had time to think what he will do with \$500,000 given over five years but he said the grant money will allow him "to take a step back and just think about a problem."

Meanwhile, there is a lot of tinkering to do, especially with electric cars, and his own Chevrolet Camaro.

'I love teaching the students to teach themselves'



Shwetak Patel with wife Julie Kientz

Since its inception in 1981, the MacArthur Genius grant has gone to 850 people, ranging in age from 18 to 82 at the time of their selection. Shwetak Patel, 29, is one of the youngest winners this year.

What has been your immigrant family like?

My parents migrated to America from India 30 years ago. My father has an engineering degree from India and my mother in biology. It was tough for them to get work in their respective fields and they went into the hotel business in Alabama. I was born in Selma, Alabama, the first of three children, and I was brought up in Birmingham, Alabama. My parents have been very supportive of whatever their children wanted to do. It was never like you must become a doctor or an engineer. Education was of utmost importance to them. My brother Shrayesh is pursuing a PhD in chemical engineering and my sister Shweta is in an MD PhD program.

What was your school life like?

Since my boyhood, I have been tinkering. My parents thought I would become a mechanical engineer. They got me a lot of gadgets to work on. They got me a computer when I was not even 10. Remember, this was about 20 years ago. I started doing research in high school. At home I used to tinker a lot with my brother Shrayesh, who is four years younger. I wrote my first computer software program in third grade and I had my first soldering iron in the next grade. I was always looking out for bigger challenges as a boy and that has continued over the years. While I volunteered for Habitat for Humanity as a teenager, I was not allowed to do more work because the organizers said I was not professionally trained. So I went on to work on getting the license as a plumber and electrician. All this when I was in high school. I did my undergraduate work at Georgia Institute of Technology in fewer than three years.

What is the most important inspiration for your research?

I ask myself at the end of the day if my teaching is inspiring my students and my research is leading to help ordinary people. This is foremost on my mind. I



A man who was staying at the hotel owned by Naran Patel in Birmingham, Alabama for a long time was taken to hospital where he died of heart failure. Before he left for the hospital, he had entrusted his possessions to Patel, including an IBM computer. No one came to claim his possessions and Patel did not know what to do with the computer. He did not know how to use one.

"In fact, we did not have a computer at home or in the hotel," he remembers. "Twenty years ago, you did not really need a computer in your home."

He remembered his son Shwetak, around eight years old at the time, had wanted a computer. A technician working for the hotel told the father that the IBM computer was nearly useless but offered a 'good' computer in exchange.

"I did not know he was not telling me the truth, and I gave him the IBM," Patel remembers. The morning after getting the 'new' computer, Shwetak got up, went straight to the computer and started using it.

"He said he had dreamed about it all through the night," Patel said. "It was like he had a vision, showing him how to use the computer. There were no computer classes for boys of his age at that time."

Shwetak was not satisfied with the gadget. "Soon, I went to Radio Shack and got a new computer," his father said. "But this time he was telling me exactly what kind of a computer he wanted. Soon, Shwetak was helping to fix his teachers' computers! I even asked him: Are you going to school to study or fix the teachers' computers?"

The Patels told their three children that they had to choose between college and running the hotel.

"Shwetak was in middle school and his siblings were very young, but I got them to join us in the discussion," the father said. "All three said they wanted to go to college."

"Shwetak was far ahead of his class," Patel continued. "Naturally, he was bored in the class. I asked the school if he could jump a few classes but at that time in Alabama there was no provision for such a thing. But when he went to college in Georgia, he

'Are you going to school to study or fix the teachers' computers?'



Shwetak Patel, center, with father Naran Patel, left, brother Shrayesh, sister Shweta and mother Kusum during his wedding

could do it (*take a bigger load of courses and get his first degree in three years*).

Shwetak, said the father "was fully focused on what he wanted to do" right from the start. "If something could be done tomorrow, he wanted to do it today, and something has to be done today, he would do it now. He was a big role model to my brother Shrayesh, who is four years younger, and sister Shweta who is three years younger to Shrayesh."

Shrayesh, who is pursuing a PhD in chemical engineering at the University of California, Berkeley, talks about how resourceful and quick-thinking his brother is.

"He taught me baseball and many other things, we had a lot of fun and many times Shwetak would join us," he recalled. "Shwetak and I collected baseball mats and we had dozens of them but we did not have a box to keep them. So we had dumped

them in a cupboard."

One day, Shwetak decided they should be properly filed. "He looked around and found a few scrap items in the house, and he got a few things from a shop, and soon we had two beautiful boxes, they looked like professionally made jewel boxes."

He did all this may be in less than an hour, Shrayesh added,

With Shwetak, even in high school, it was not the question of Can-I-Do-It, his brother said. "It was always like, How Will I Do It. He had big confidence in himself, and that has helped him to be an over-achiever."

Julie Kientz, who like her husband Shwetak, is an assistant professor at the University of Washington, first met him during their first year of graduate school at Georgia Tech. She remembers him introducing himself and asking her to be on his project team for their human-computer interaction class.

"During the semester, we became friends since we stayed up many late nights working on the project," she recalled. "After that semester, we remained in close contact when we both ended up working in the Ubicomp Group. We were great friends for several years and then while studying for our qualifying exam together, we realized there might be more to our friendship. Ever since then, we've been supporting each other as we continued through the process of obtaining PhDs and becoming faculty."

He proposed to her at a ski resort in January of 2009, near Mt Rainier. The two sat down on the side of the slope overlooking Mt Rainier.

"He then popped the question; he still had his snowboard gear on, so there wasn't much kneeling involved," she added. "He didn't have the real ring yet, since his dad had just come back from India with it, so he had secretly grabbed a ring from my jewelry box to propose with. Little did he know, it was actually a toe ring! How romantic!"

The two make home in Seattle with their cats, Link and Zelda.

— Arthur J Pais

'I love teaching the students to teach themselves'

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want to solve problems in ordinary homes. Over four years ago, I began thinking how technology could help provide remote care for the elderly. The standard approach was to install expensive cameras and motion detectors throughout a home so that one could see when somebody fell or became sick. Installing cameras or motion sensors everywhere is unreasonably expensive. I wondered what would give us the same information and be reasonably priced and easy to deploy. As I started a new job in the computer science and engineering departments at the University of Washington, I continued working on creating new products to deal with this problem and all this turned into the startup Zensi which offers inexpensive home-energy sensors. I then began focusing on devising similar techniques to monitor home consumption of water and gas.

You were not even 27 when you began teaching...

I was the youngest ever professor in the department. There were many times — and it happens even now — that I am mistaken for a grad student! In most departments in

this university and elsewhere, you do not see professors in their late 20s. I use my age to my advantage in teaching a complex subject. Students find me much more approachable than the older professors. I am able to develop deeper relationship with my students.

What is the best advice you give to your students?

I tell this my undergrad and grad students that it is important to have self-confidence. It is good that I have an opportunity to impress this idea on the undergrads. Often good students don't do well in studies and then in life because they lack confidence in themselves. Often people are reluctant to do new things, even if they have the knowledge because they lack confidence, I don't believe in holding hands of students. I tell them that it is also important to have an inquisitive nature. I have had this inquisitive nature from my childhood. Students should have some uncertainties in their lives and studies and they should be able to connect to the real world. Whatever they do in this process should excite them and make them better learners. I love teaching the students to teach themselves.

What do you enjoy most?

Both my wife and I love traveling, trekking and outdoor sports. We have been to many countries including China. I also enjoy tinkering, a lot of times with my car. We have two cats.

What are some non-technical books you have enjoyed in recent years?

Our bookshelves are quite empty! We are into digital books, this way we are able to have more content. Among the books that have fascinated me in recent years are *Freakonomics* and *The Blindside*. The former asked interesting questions such as why do people do what they do. It asked questions that typically economists do not ask and questioned conventional wisdom. *Blindside* (by Michael Lewis) is the true story of a white family in the South who adopted Michael Oher, a homeless black kid. Oher becomes a football star. Learning the game's strategy and making it as a student is an inspirational story. I was also intrigued by how their original mindset was challenged and how they overcame the past norms.

— Arthur J Pais