

Winning the Imitation Game

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ECE Alum Recognized for Advances in GPS Security

Todd Humphreys began studying electrical engineering at Utah State University with the intention of becoming a patent lawyer. His career path changed, however, thanks to a professor who told him he had the heart of an engineer.

"I'll be eternally grateful to Dr. Todd Moon for redirecting me because I've seen several of my friends who went off to have careers in law and they don't have nearly as fun and creative of a life as I do," Humphreys said.



USU alumnus Todd Humphreys is now a professor of aerospace engineering at The University of Texas at Austin. Humphreys has received international acclaim for his work on making GPS technology more secure.

A third-generation Aggie, Humphreys completed his bachelor's and master's degree in electrical engineering from Utah State. As an undergraduate, Humphreys interned at NASA's Jet Propulsion Laboratory which sparked his interest in aerospace engineering.

"That was a game changer for me," he said. "Going into that internship convinced me that I wanted to do more research."

After graduating from Utah State in 2003, Humphreys went to Cornell to pursue a Ph.D. in aerospace engineering and began studying the new world of GPS. Though the GPS constellation had been around for about a decade, in the early 2000s it immediately became more accurate when the United States Federal Government shut off the selective availability option.

The purpose of selective availability was to make GPS signals more secure. Shutting it off significantly improved the access the public had to the resource, however it also made the constellation more vulnerable to security threats including GPS spoofing.



GPS spoofing occurs when a navigation system is disrupted by a false GPS signal.

To address this threat, Humphreys built the world's first openly disclosed and fully functional portable GPS spoof. He published a paper on his work, which is to this day his most cited piece.

"This paper just opened up the floodgates," Humphreys said. "It seemed like every researcher around the world had an idea for how to defend against or detect spoofing."

Humphreys's research and demonstrations of the vulnerability of systems that rely on GPS have earned him national recognition. In addition to being recognized by UT Austin as an outstanding lecturer, he has received prestigious awards from the National Science Foundation including the CAREER award and the Presidential Early Career Awards for Scientists and Engineers. Earlier this year, the USU Electrical Engineering department named him their distinguished alumnus for the year.

"Todd is a prime example of the ideals we see in our graduates," said Jake Gunther, head of the electrical and computer engineering department. "He is an imaginative, creative, inventive engineer and researcher who builds and contributes to the greater good."

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