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GOLLAKOTA WINS ACM AWARD FOR CONVERTING WIRELESS INTERFERENCE INTO A BENEFICIAL PHENOMENON IN PRACTICE

MIT Doctoral Candidate Designed First WiFi Receivers that Reconstruct Transmitted Information to Improve Performance and Security

NEW YORK, May 7, 2013 – Shyamnath Gollakota has won the 2012 Doctoral Dissertation Award presented by [ACM](#) (the Association for Computing Machinery) for designing practical systems that transform wireless systems by embracing the phenomenon of interference and rendering it harmless. Instead of trying to hide the interference that severely limits wireless systems, he used an alternate approach that successfully reconstructed the traditional packets of transmitted information. He then manipulated the interfering signals using innovative receiver designs that decode the WiFi collisions and improve security. Gollakota, an assistant professor at the University of Washington, completed the dissertation at Massachusetts Institute of Technology, which nominated him. He will receive the [Doctoral Dissertation Award](#) and its \$20,000 prize at the annual ACM Awards Banquet on June 15, in San Francisco, CA. Financial sponsorship of the award is provided by Google Inc.

Honorable Mentions for the 2012 ACM Doctoral Dissertation Award went to Peter Hawkins, nominated by Stanford University and Gregory Valiant, nominated by the University of California, Berkeley. They will share a \$10,000 prize, with financial sponsorship provided by Google Inc.

In his dissertation, “Embracing Interference in Wireless Systems,” Gollakota presented ZigZag, the first WiFi receiver that successfully reconstructs the transmitted information in the presence of packet collisions. He also introduced TIMO, a WiFi receiver that decodes information in the presence of high-power cross-technology interference from other devices such as baby monitors, cordless phones, and microwave ovens.

Gollakota’s practical approach also showed how to harness interference to improve security using wireless medical implants, which are susceptible to attacks over wireless channels. He developed the first system that provides confidentiality for implants’ transmissions. The system protects them against commands from unauthorized parties without requiring any modification to the implants themselves.

To make security easy for ordinary users, he introduced the first system that enables WiFi users to establish secure connections without any passwords or pre-shared secret keys. His idea was to construct a new secure message type that can neither be altered nor hidden without detection.

A graduate of MIT with Ph.D. and M.S. degrees in Electrical Engineering and Computer Science, Gollakota also earned a BA degree in Computer Science and Engineering at Indian Institute of Technology Madras. He received two ACM SIGCOMM (Special Interest Group on Data Communication) Best Paper awards, in 2008 for ZigZag decoding, and in 2011 for securing medical implants. He also received the AT&T Applied Security Award for password-free wireless security.

Honorable Mention recipient Peter Hawkins' dissertation, "Data Representation Synthesis," explores the problem of specifying combinations of data structures with complex sharing and results in provably correct code. In his work on program synthesis, he developed techniques that allow programmers to write their code at a high level, aiding verification while still retaining control over low-level details that are important for efficiency.

His work received the Best Paper award at the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI) in 2011 and the Distinguished Paper award in 2012. A native of Canberra, Australia, Hawkins was a member of Australia's first Informatics Olympiad team. He received Ph.D. and M.S. degrees from Stanford University in Computer Science, and a B.Sc. degree at the University of Melbourne, Australia. Currently, he is a Research Scientist at Google in Mountain View, CA.

Honorable Mention recipient Gregory Valiant's dissertation "Algorithmic Approaches to Statistical Questions," examines several basic statistical questions from the computational perspective. This work, at the intersection of algorithms, learning, information theory, and statistics, provides insights into several of the challenges encountered in the analysis of today's large datasets.

A graduate of Harvard University with a B.A. degree in Mathematics and an M.S degree in Computer Science, he received a Ph.D. degree from UC Berkeley under the supervision of Christos Papadimitriou. Valiant is a post-doctoral researcher at Microsoft Research, New England, and will join Stanford University's computer science department in the fall of 2013.

About ACM

ACM, the Association for Computing Machinery www.acm.org, is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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