

CSAIL graduate honored with ACM award

Massachusetts Institute of Technology

Shyamnath Gollakota, an MIT graduate who completed his doctoral research in Professor Dina Katabi's Networks@MIT research group at CSAIL, has won the 2012 Doctoral Dissertation Award presented by the Association for Computing Machinery (ACM). Gollakota was honored for his work 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, Gollakota 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 MIT, which nominated him for the award. He will receive the Doctoral Dissertation Award and its \$20,000 prize at the annual ACM Awards Banquet on June 15 in San Francisco, Calif. Financial sponsorship of the award is 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 SM 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.

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