Prem Chahal Receives DARPA Young Faculty Award

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Prem Chahal, assistant professor of electrical and computer engineering (ECE), is the recipient of a 2012 Young Faculty Award (YFA) from the Defense Advanced Research Projects Agency (DARPA).

The objective of the DARPA Young Faculty Award (YFA) program is to identify and engage rising research stars in junior faculty positions at U.S. academic institutions and expose them to Department of Defense (DoD) needs as well as DARPA's program development process.

The YFA program provides funding, mentoring, and industry and DoD contacts to awardees early in their careers so they may develop their research ideas in the context of DoD needs. The long-term goal of the YFA program is to develop the next generation of academic scientists, engineers, and mathematicians in key disciplines who will focus a significant portion of their career on DoD and national security issues.

Chahal received the funding for his research proposal, titled "Heterogeneous Integration of Nano-Devices for Terahertz Circuit Applications."

The objective of this research is to develop terahertz circuits by integrating nano-devices on silicon substrate. Terahertz (THz) is one of the least explored regions of the electromagnetic spectrum. This is largely because of lack of availability of devices operating at these frequencies. Chahal and researchers in the Terahertz Systems Lab see this project as an exciting opportunity to apply recent scientific advances in nano-devices and introduce practical circuits operating at THz for imaging applications.

Terahertz holds potential for use in high-bandwidth communications, medical imaging, security, spectroscopy, drug discovery, environment monitoring, and quality control, to name a few. Applications for terahertz imaging that are envisioned include detection of skin cancer without biopsies and analysis of wounds under an intact dressing or bandage. In addition, firefighters could analyze gas plumes for hazardous materials from a distance, and security personnel may be able to image through clothing or packaging materials.

Chahal received his PhD from Georgia Institute of Technology in 1999. He joined the MSU ECE department in 2009. He worked as a research scientist at Raytheon and Abbott Laboratories prior to coming to MSU. Terahertz and millimeter-wave electronics are the focus of much of Chahal's research.

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