

Designing New Communication Networks



Elza Erkip
Professor, Electrical and Computer Engineering

CURRENT RESEARCH

Information theory for wireless networks is promising better communication

There are nearly as many activated cell phones in the world as there are people, and they are all competing for access to the same networks. Dr. Elza Erkip is researching ways to utilize the multitude of available frequencies presented by millimeter wave networks for next (5th) generation wireless technologies using the most energy-efficient methods possible. Information theory very successfully identifies the essential features of a communication system and provides a theoretical foundation for practical system design. This research allows Dr. Erkip to understand the cornerstone concepts for building a communication system by asking deep and fundamental questions. As an increasing amount of communication takes place through wirelessly-connected devices, redesigning the way they connect to networks will allow for more efficient signal transmission that uses less of the device's power.

In any communication network, multiple users send electrical signals that interact during the communication from the device to the base station. All of these signals interfere with one another, which typically congest networks, eliminating the hope of a clean channel between device and base station. Dr. Elza Erkip, professor of electrical and computer engineering at New York University Polytechnic School of Engineering is researching wireless communication and the interaction between electrical signals. Her research aims to understand how multiple users interact, compete, and cooperate in communication networks. These three features are an essential part of any communication system, from cellular networks to cloud computing. She is hoping to provide a fundamental understanding of how such networks should be designed and operated...

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AFFILIATION

 New York University

EDUCATION

- Ph.D. in Electrical Engineering, 1996
Stanford University
- M.S. in Electrical Engineering, 1993
Stanford University
- B.S. in Electrical and Electronics Engineering, 1990
Middle East Technical University, Turkey

AWARDS

- CAREER award, 2001
- Stephen O. Rice Paper Prize, 2004
- Best Paper Award, 2007
- Award for Advances in Communication, 2013
- Highly Cited Researchers in Computer Science, 2014

RESEARCH AREAS

Technology, Telecommunications, IOT, Devices, Data, Clean Energy

FUNDING REQUEST

Dr. Erkip's work is highly theoretical; your contributions will be directed toward funding travel expenses, which enable her to attend conferences to network and interact with collaborators around the country. Funding will also cover staffing, required personnel include graduate and postdoctoral students that understand the practice of directly designing working models.