



Wireless Internet Center for Advanced Technology
NSF Industry/University Cooperative Research Center



WICAT Program

Polytechnic Institute of NYU

CATT Research Review

November 21, 2008

Henry Bertoni





WICAT: an NSF Sponsored Consortium of Universities and Industry

- WICAT: Daughter of CATT
 - Initially funded by NYSTAR
- WICAT Partners
 - 4 Universities (Poly, UVA, Virginia Tech, Auburn)
 - 25 Companies
 - 5 Federal and State agencies



Research Areas

- Cooperative communications
- Video over wireless
- Efficient power electronics for energy harvesting
- Wireless network security
- Channel prediction for mobile-to-mobile communication
- Single carrier OFDM for long term evolution



Cooperative Communications

- One or more neighboring mobiles assist in message transmission
- Assistance can involve physical and/or MAC layers
- Implementations in progress using software defined radios
- Faculty: E. Erkip, S. Panwar, M. Knox, T. Korakis, P. Liu



Video Over Wireless

- Transmission using multiple channels
- How video applications can make use of co-op communication
- Relating perceived quality to packet loss
- Multicasting video in wireless networks
- Faculty: Y. Wang, S. Panwar, E. Erkip



Energy Harvesting

- Piezoelectric element converts body motion into electrical energy
- Efficient power electronics converts piezoelectric output to usable voltage
 - 82% efficiency
- Faculty: D. Czarkowski



Wireless Network Security

- Hardware assurance
- Forensics & data recovery
- Bootstrapping security between mobiles
- Faculty: R. Karri, N. Memon, N. Saxena



Channel Prediction

- Rapid computation for mobile-to-mobile communication
- Faculty: H. Bertoni

Cellular Long Term Evolution

- Single channel OFDM
- Faculty: D. Goodman