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September 6th, 2007 10:30 am

Research Topic

Chaotic Networks

Research Problem

How can we make unplanned networks more efficient and self-managing?

Problem Statement

Given a chaotic network, create automated power control and rate adaptation algorithms to increase the overall performance.

Chaotic Network: A wireless network that has not been planned out or managed in any meaningful way.

Problem Description

In the past, dense wireless networks have generally been deployed in campus-like environments where the placement of access points have been carefully planned out. The increase of personal wireless technology is resulting in unplanned and unmanaged wireless deployment. These wireless devices share the same spectrum with other networking technologies and can work against each other. Professor Steenkiste's research seeks to develop techniques for making chaotic networks self-managing and self-configuring.

Computer Science Perspective

The benefits of choosing good values for rate selection and transmission power in a well-planned and managed wireless network have already been demonstrated. This research explores automated power control and rate adaptation algorithms that reduce interference among nodes while ensuring robust client performance.

Actively Involved Disciplines

Electrical Engineering and Computer Science are the only actively involved disciplines.

Actively Involved Discipline: A discipline from which there is a member involved in the proto-type construction or testing stages of the research process.

Description of Disciplines Involved

Electrical Engineering and Public Policy both play a significant role in application of this research. Currently, there are already restrictions on wireless hardware's maximum transmission power. With the introduction of these algorithms, these restrictions could be adapted to require dynamic adjustment of transmission power.

References

General Information about the researcher

<http://www.cs.cmu.edu/~prs/>

Self-Managing Chaotic Wireless Networks

<http://www.cs.cmu.edu/~prs/wireless-research/index.html#chaotic>

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