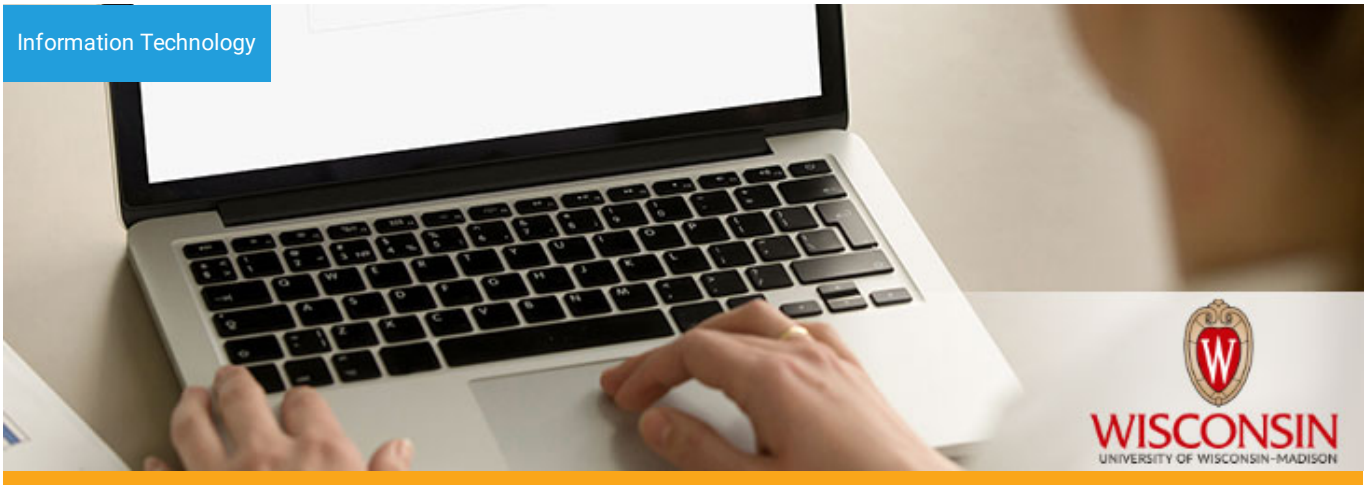
Information Technology



Apparatus and Algorithms for Channel Management in Wireless Local Area Networks

View U.S. Patent No. 8,064,921 in PDF format.

WARF: P06380US

Inventors: Suman Banerjee, Arunesh Mishra

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method that provides enhanced bandwidth usage, interference minimization and load balancing for wireless local area networks.

Overview

Wireless local area networks (WLANs) operate in a limited spectrum. As a result, WLANs require the efficient management of bandwidth to provide adequate access to networks.

Computers and other devices access WLANs through access points (APs) which are assigned a specific frequency channel. As a basic design rule when assigning channels, APs within range of one another are set to different “non-overlapping” channels to reduce interference.

Such conventional channel assignment techniques often do not result in optimal bandwidth usage. In addition, such techniques do not account for interference known as “hidden interference,” which occurs between APs and clients of neighboring APs. These techniques also fail to address how many clients may be in communication with each AP, creating a load balancing problem among different APs.

The Invention

UW-Madison researchers have developed a method of assigning channels to a plurality of access points of a wireless local area network to provide enhanced bandwidth usage, interference minimization and load balancing. The method identifies a range set and an interference set for each client of a WLAN. Using a hierarchy of importance for each AP, it then calculates a respective interference level that would be experienced by that AP in at least two channels, and stores that information. The analysis cycles until AP assignment results in optimized throughput and interference.

Applications

- Wireless local area networks
- Voice-over WLAN

Key Benefits

- Reduces interference at clients by 50 to 70 percent
- Explicitly captures interference effects at clients
- Can be applied efficiently to a wide range of in-building and outdoor scenarios

Additional Information

For More Information About the Inventors

- Suman Banerjee

Related Technologies

- See WARF reference number P06353US for a related technology.

Tech Fields

- Information Technology : Networking & telecommunications

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842