In a wireless sensor network, Convergecast is a many-to-one communication pattern in which many or all sensors send data to one base station. A typical objective is to minimize the time taken to collect all data. Alternatively, an urgent deadline may make delivery of all data impossible, in which case we would seek to deliver as much valuable data as possible, based on some notion of the utility of a data item, or of a collection thereof. Due to the broadcast nature of wireless communication, a schedule of the transmissions is required in order to avoid collisions. The goal is then to select a subset of the data, which can be feasibly scheduled and delivered in time so that the total utility of received data is maximized.

Problem Scenario, Definition and Objectives

Convergecast

Deadlines and Data Bundles

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General Framework

Centralized Solution

Distribution Solution

Aggregation and Multiple Frequency

Eliminate secondary interference by Multiple Frequency

Two Aggregation Strategies: Opportunistic or Mandatory

Simulation Results

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