

# A Singlehop Collaborative Feedback Primitive: Threshold Queries in Wireless Sensor Networks

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*Abstract*—To speed-up the collaborative feedback collection in a singlehop wireless sensor network deployment, initiator can exploit the receiver-side collision detection. The initiator node queries a predicate  $P$  in its neighborhood in constant time by making all the nodes answer simultaneously. Despite the collisions the initiator is still able to infer useful information from a broadcast (an activity in the channel means the predicate  $P$  holds for at least one node, while silence indicates that  $P$  does not hold at any queried node). Using this primitive, we investigate the threshold querying problem, where the initiator has to deterministically and precisely learn whether  $P$  holds in the network at least threshold  $t$  number of nodes in singlehop of the initiator. To answer the threshold queries in an efficient fashion, an adaptive querying mechanism that dynamically re-groups the queried nodes in the network is proposed. We evaluate our method on Kansei testbed and carry out a number of simulations to contrast our approach with the traditional techniques. The experiments reveal that we can perform threshold queries much faster.

## I. INTRODUCTION

To be updated subsequently.