Project Summary 132

Internet of Moving Things using Full Duplex Mesh Networks: Presentation

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Data-Supported Transportation Operations & Planning Center (D-STOP)

A Tier 1 USDOT University Transportation Center at The University of Texas at Austin

D-STOP is a collaborative initiative by researchers at the Center for Transportation Research and the Wireless Networking and Communications Group at The University of Texas at Austin.

D-STOP

Internet of Moving Things using Full Duplex Mesh Networks

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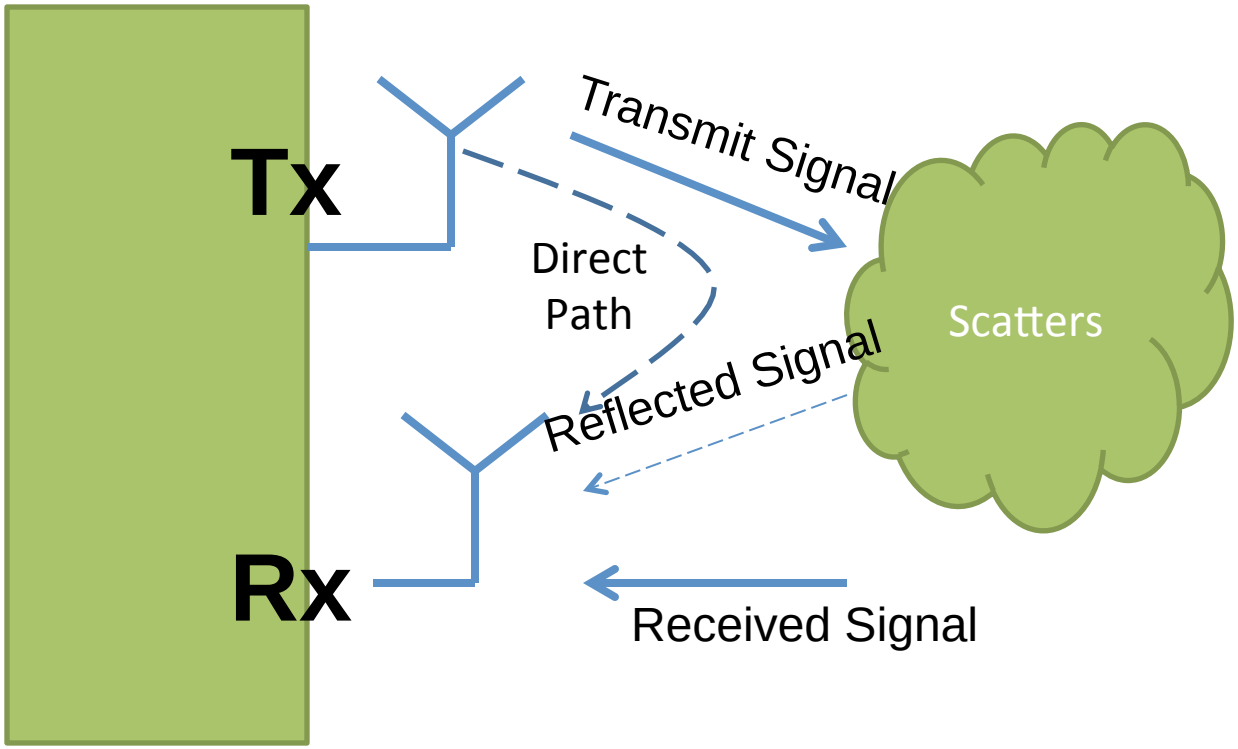
Self Interference in Full Duplex

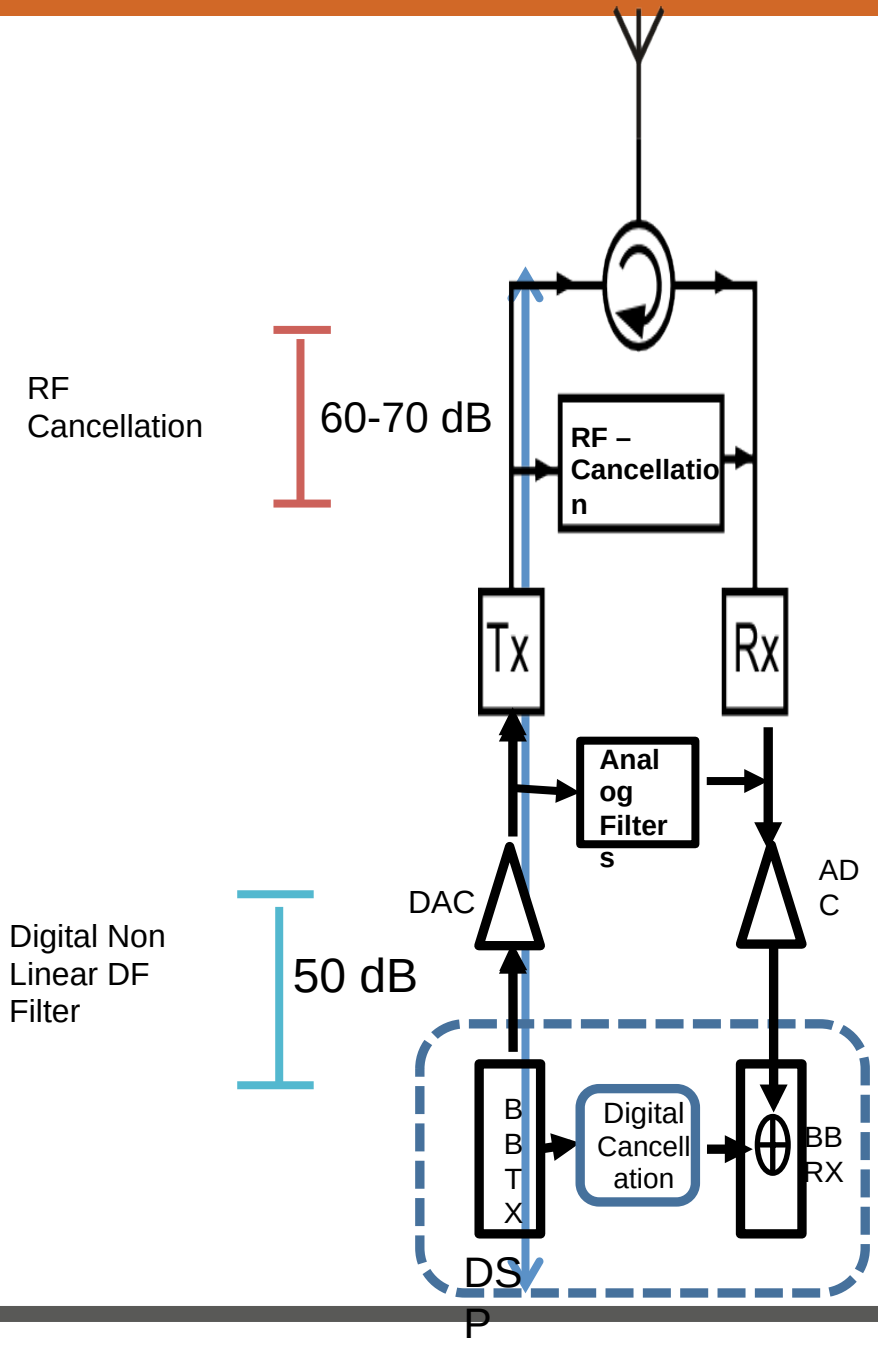


x -> received signal
z - > transmit signal
w-> noise signal

True Full Duplex Radios

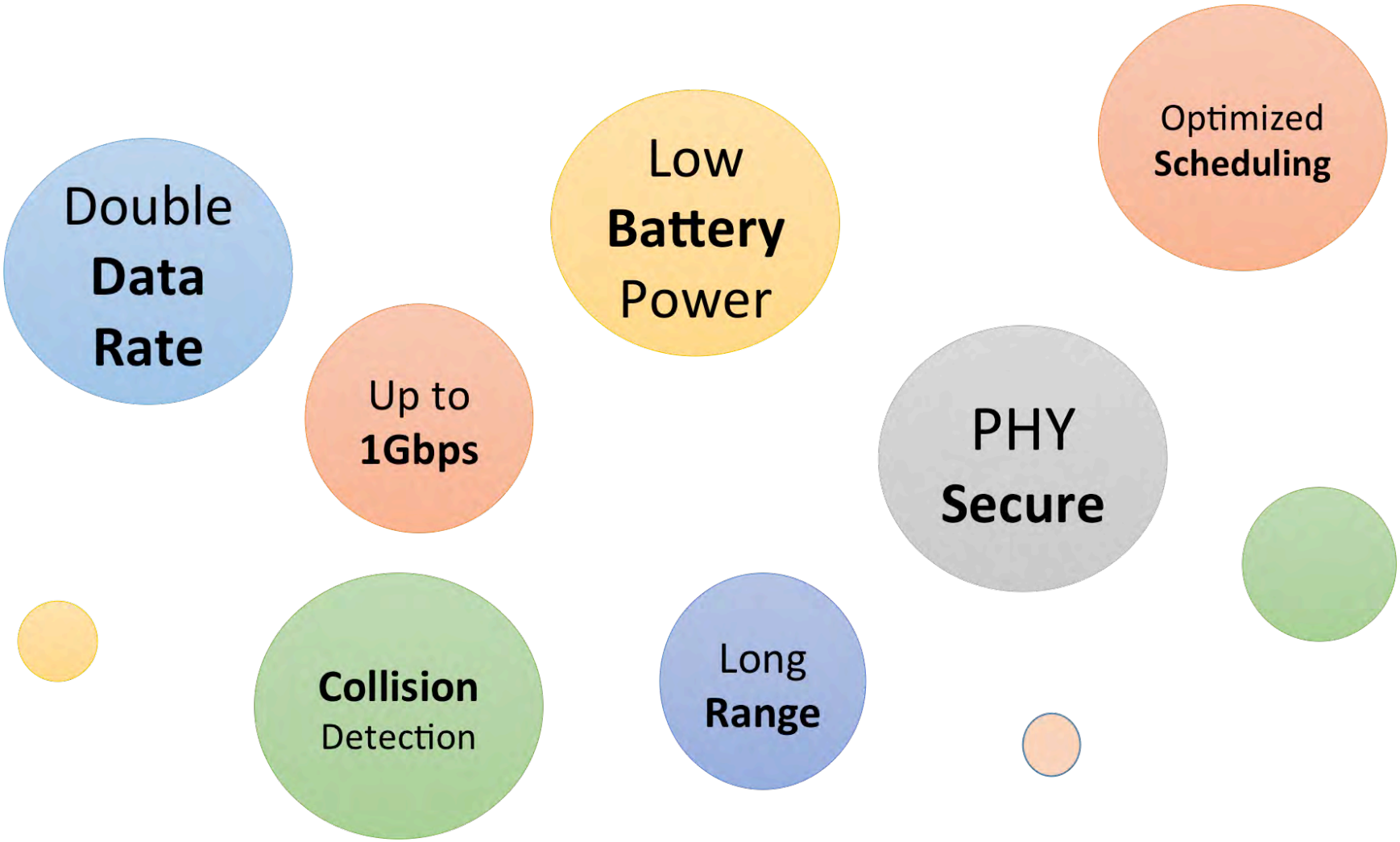
- Possible through self-interference isolation and cancellation
  - 110+dB of isolation/cancellation necessary
- Enables listen-while-talking
  - Much more efficient mobile meshing

- Cancellation of self interference
  - Using discrete components
  - 110 dB
- Single antenna
- Works well with MIMO



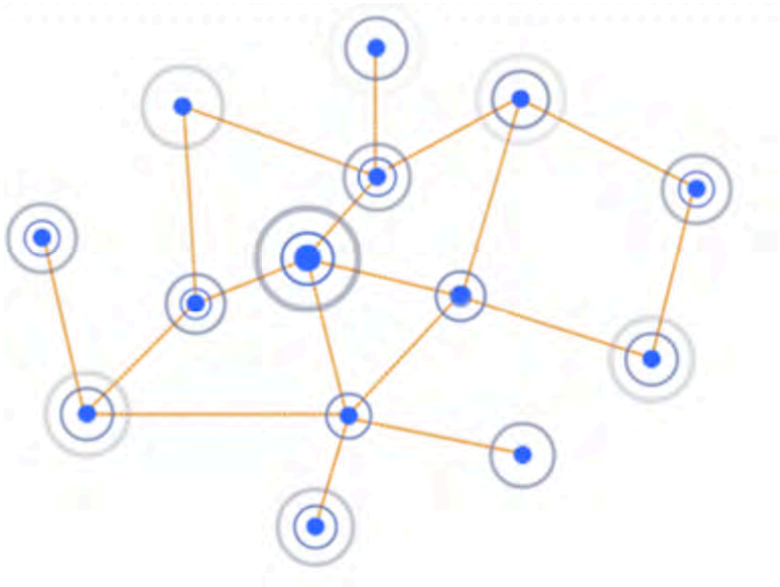
Our prototype: 2.4G, 20 MHz, 100 Mbps

Advantages of Full Duplex



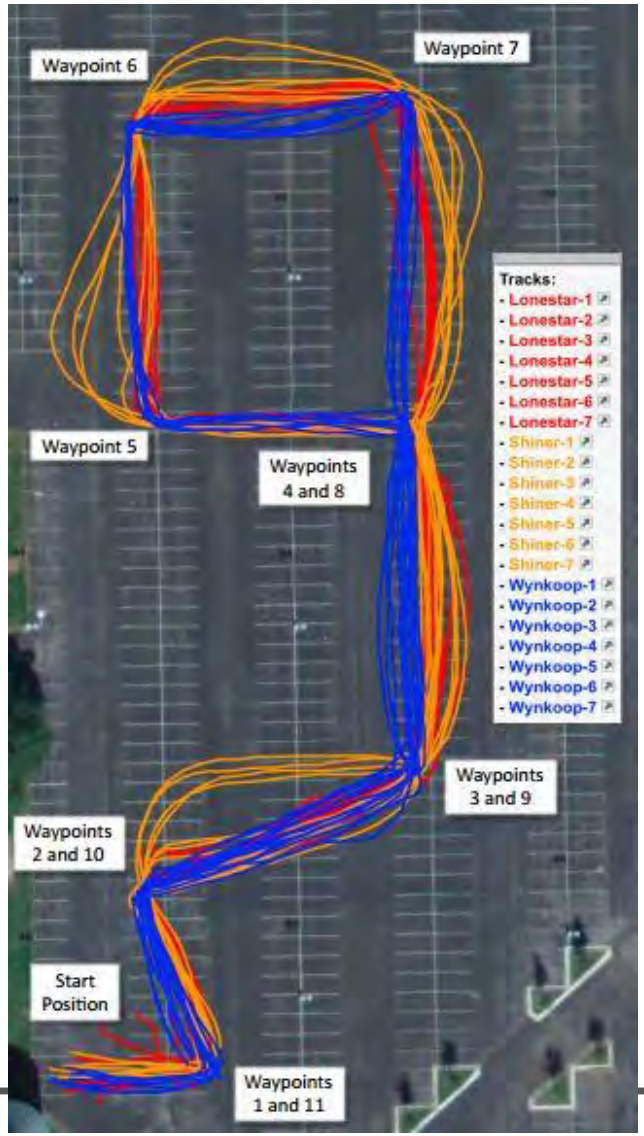
Internet of Moving Things (IoMT)

- Full duplex + mobile meshing
  - Marriage made in heaven
  - Low overhead, high throughput meshing
- Connect people and devices as they move
  - As they move
  - Discovery, routing, handoff efficient

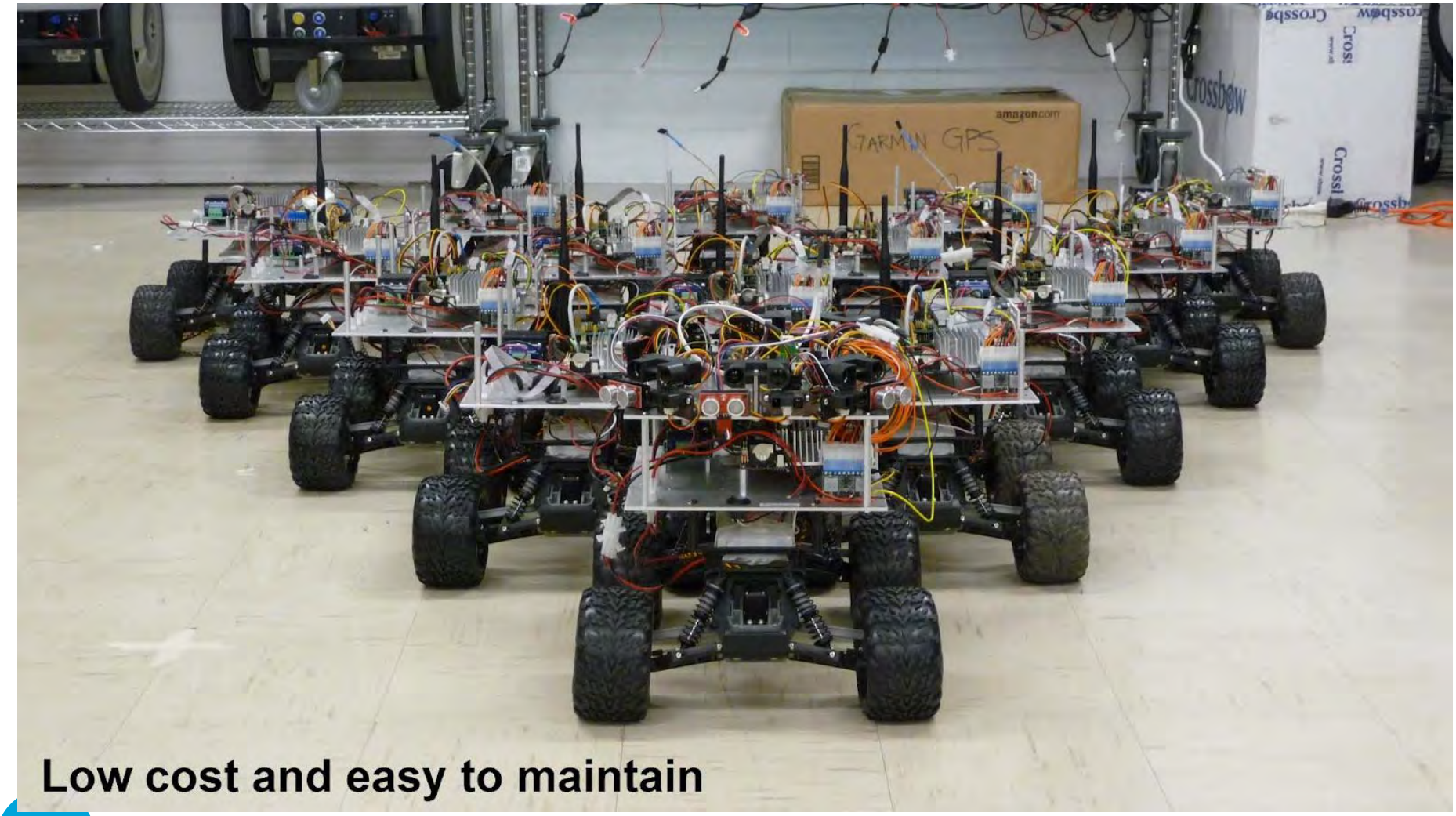


Testing over actual paths

Structured & Random Movement



Scalable Testing – Great Results



Low cost and easy to maintain