

The University of Texas at Austin

VISION OF IOT

- Continuous sensing for context inference
- Seamless interaction between users and space
- Trillions of sensors embedded into surrounding
- Intelligent context-aware spaces everywhere

PASSIVE RFID: IDEAL CANDIDATE

- Cheap (Costs around 10 cent)
- Mature hardware and software stack
- Battery-free operation
- Wireless interrogation possible

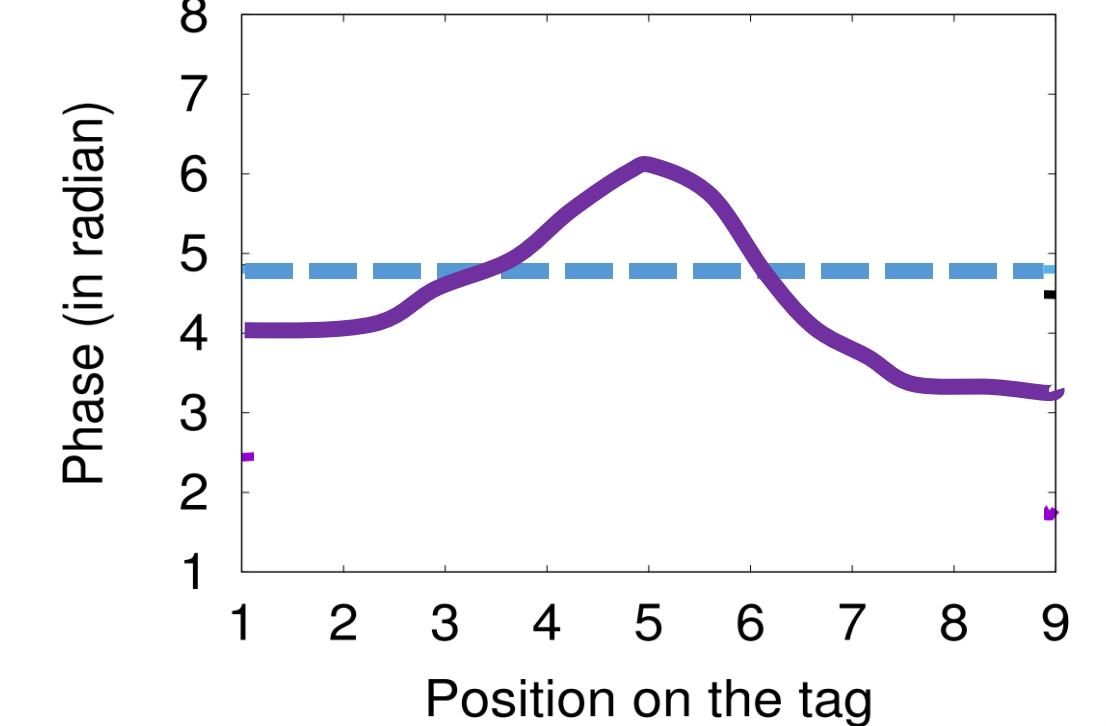
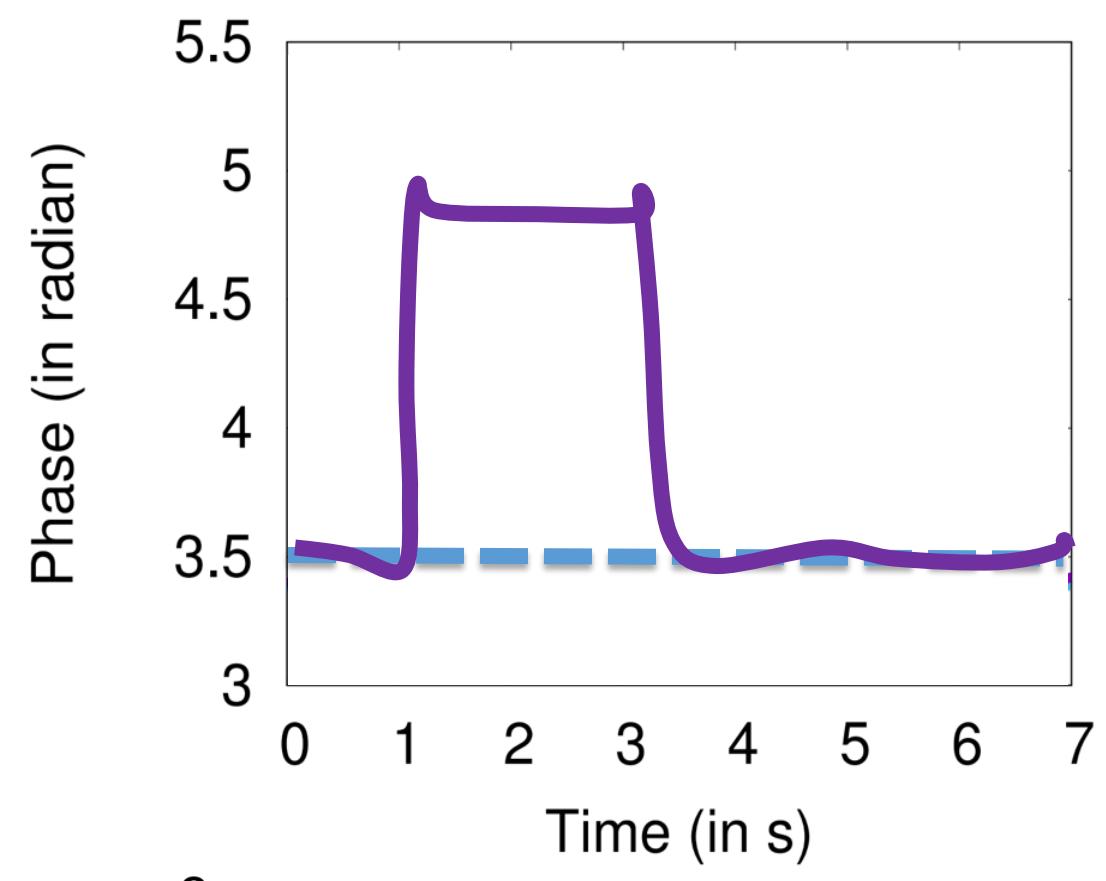
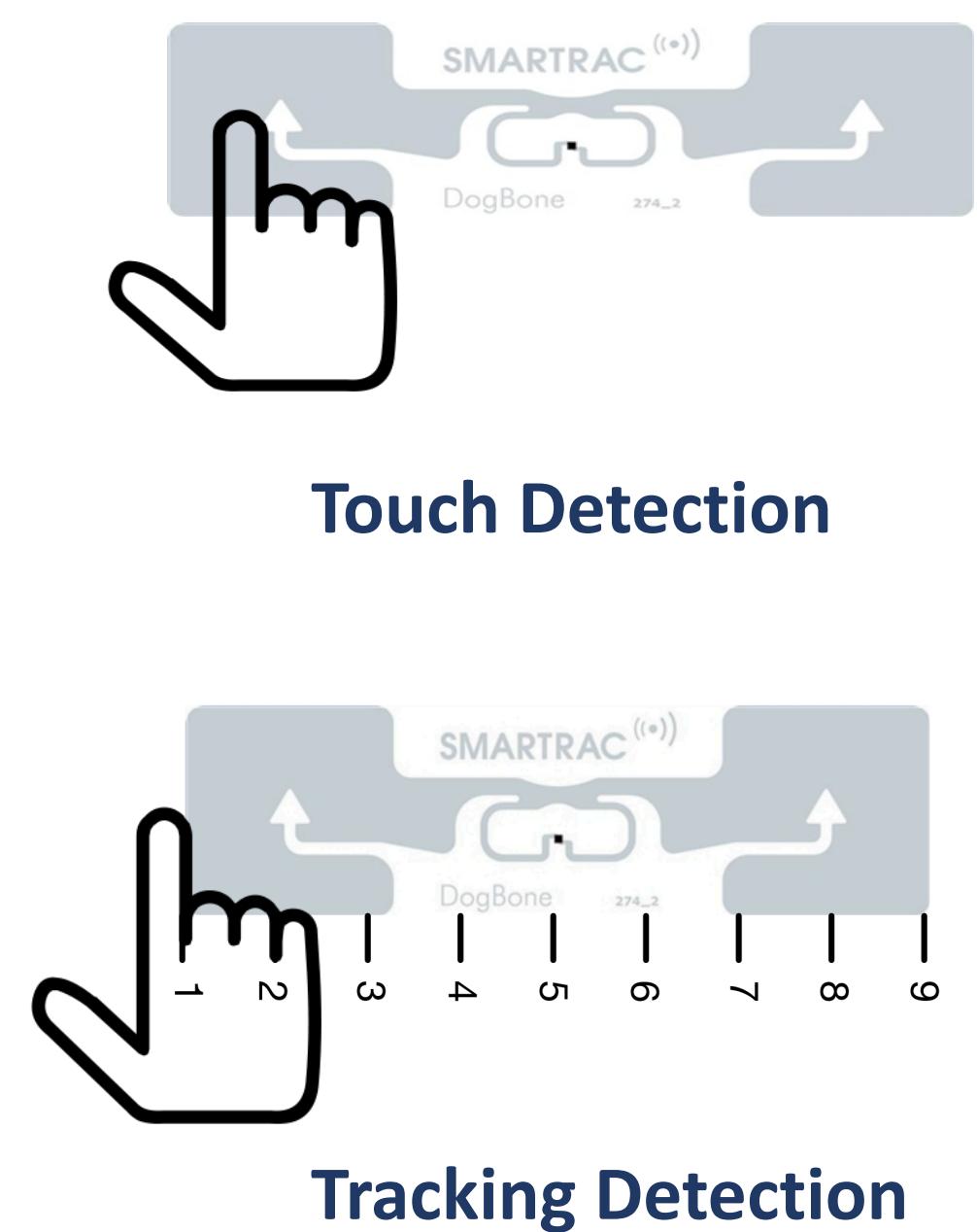
TAKING RFID BEYOND ID

- Making Touch Gesture Interface
 - Detecting touch interaction wirelessly
 - Option of making any object interactive
- Temperature Sensing Module
 - Sensing room temperature without battery
 - Making continuous measurement possible

KEY IDEAS

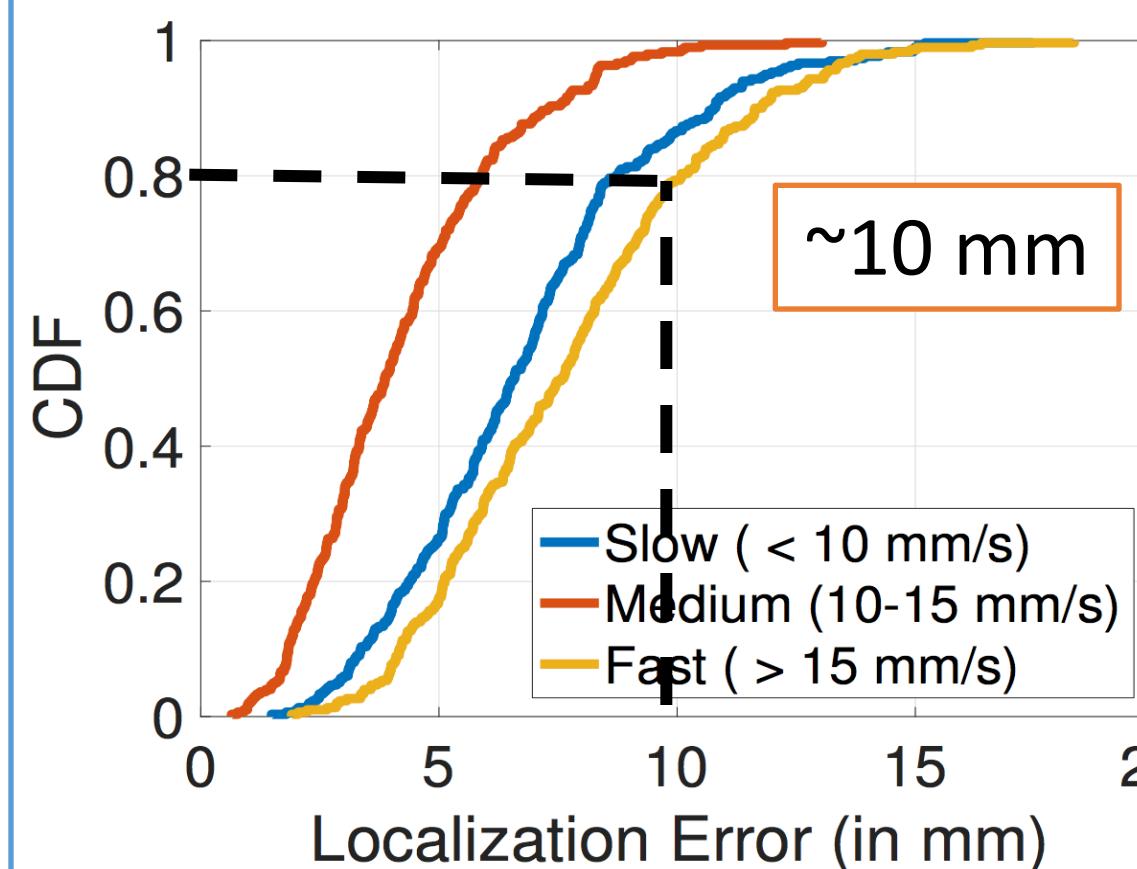
- Human touch changes tag antenna impedance and that manifests into phase change of signal
- Temperature changes the material property of tag antenna and thus changes reflected signal

RIO: TOUCH GESTURE INTERFACE

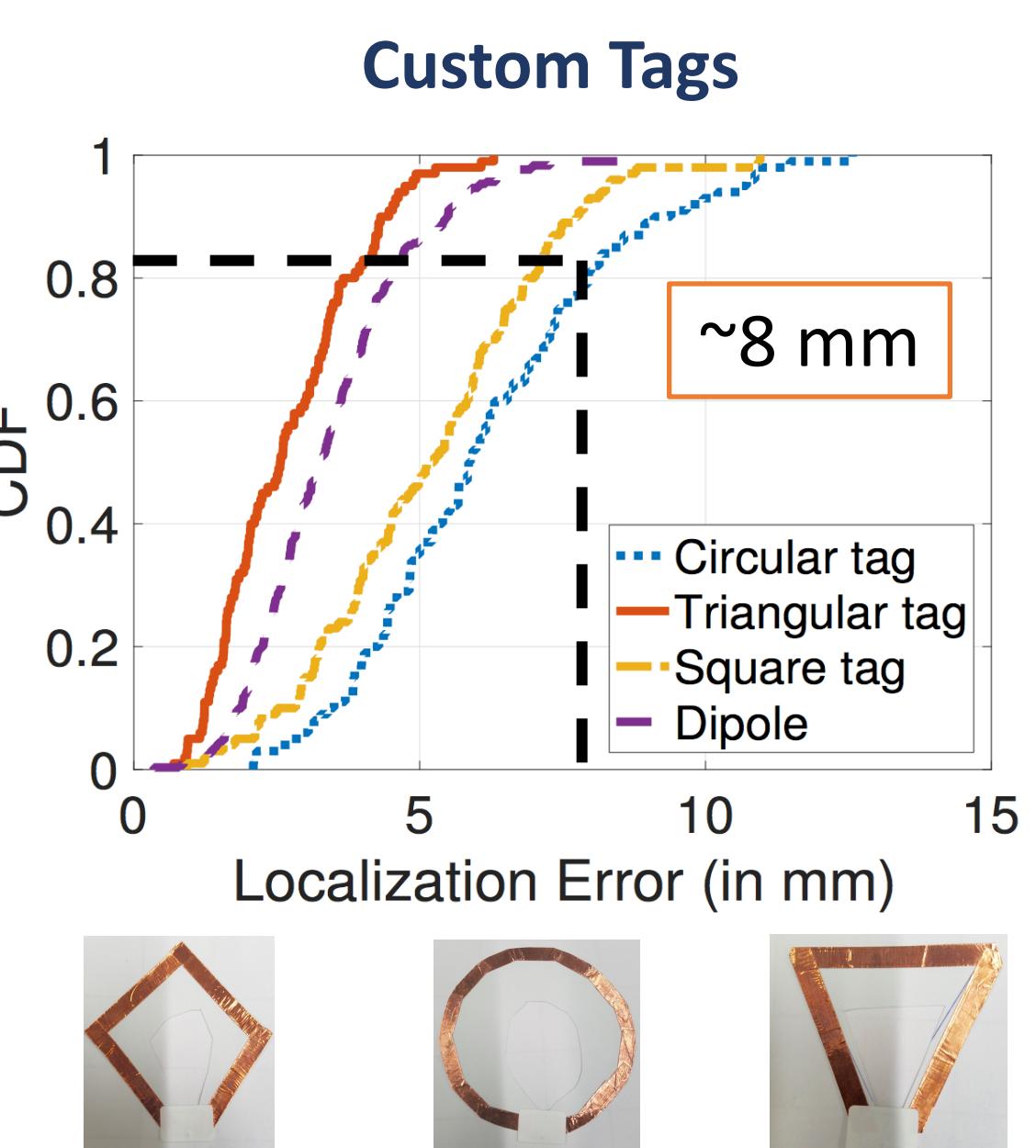


EVALUATION

COTS Tags



Custom Tags

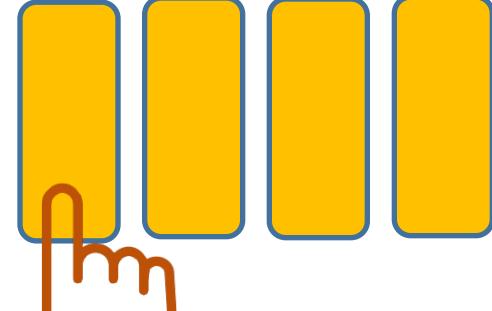


USE CASES

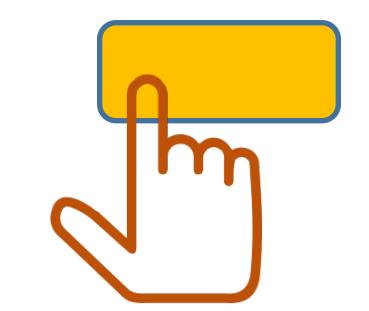
Button



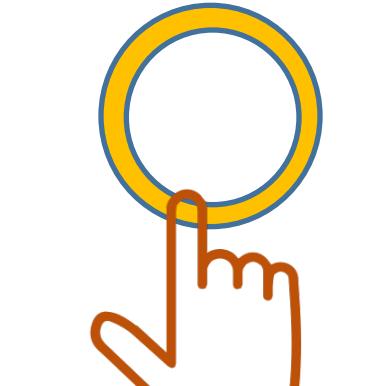
Keyboard



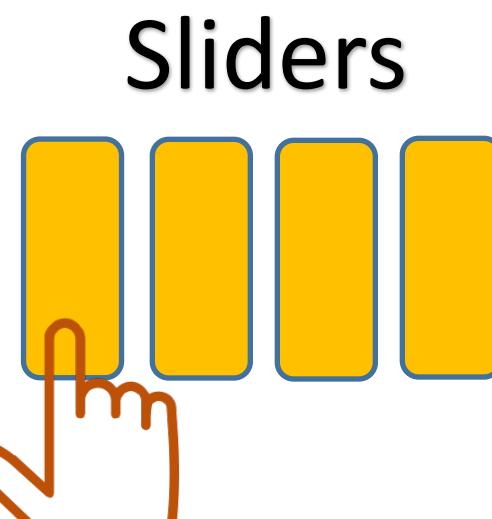
Slider



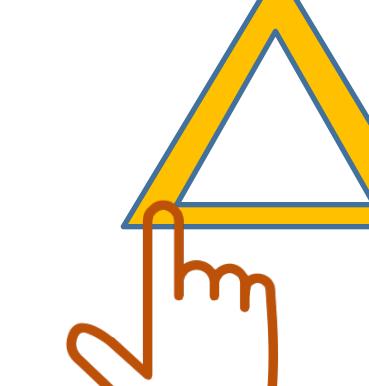
Dial



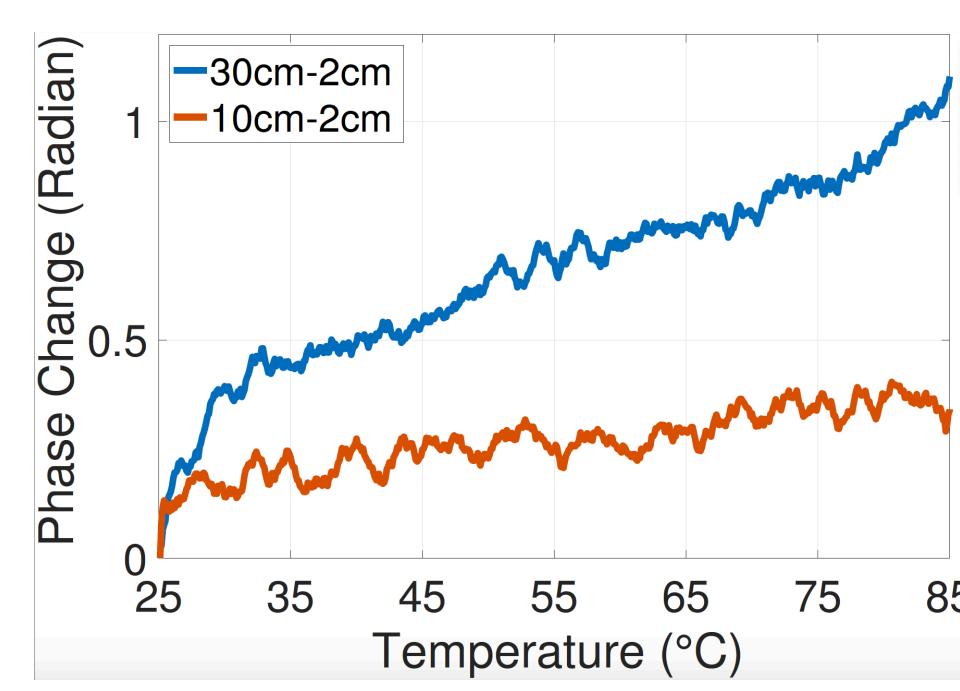
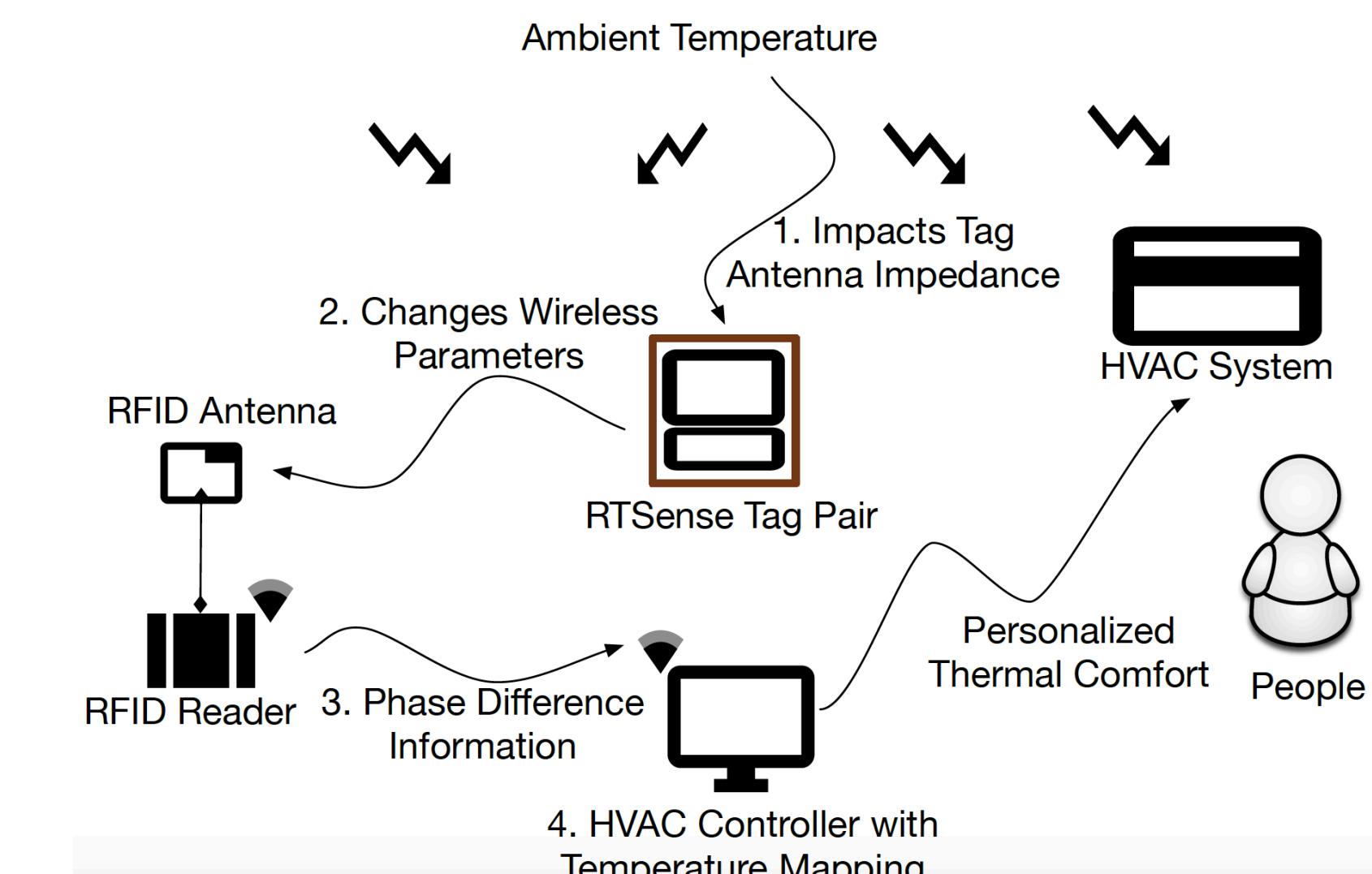
Multiple Sliders



Shapes

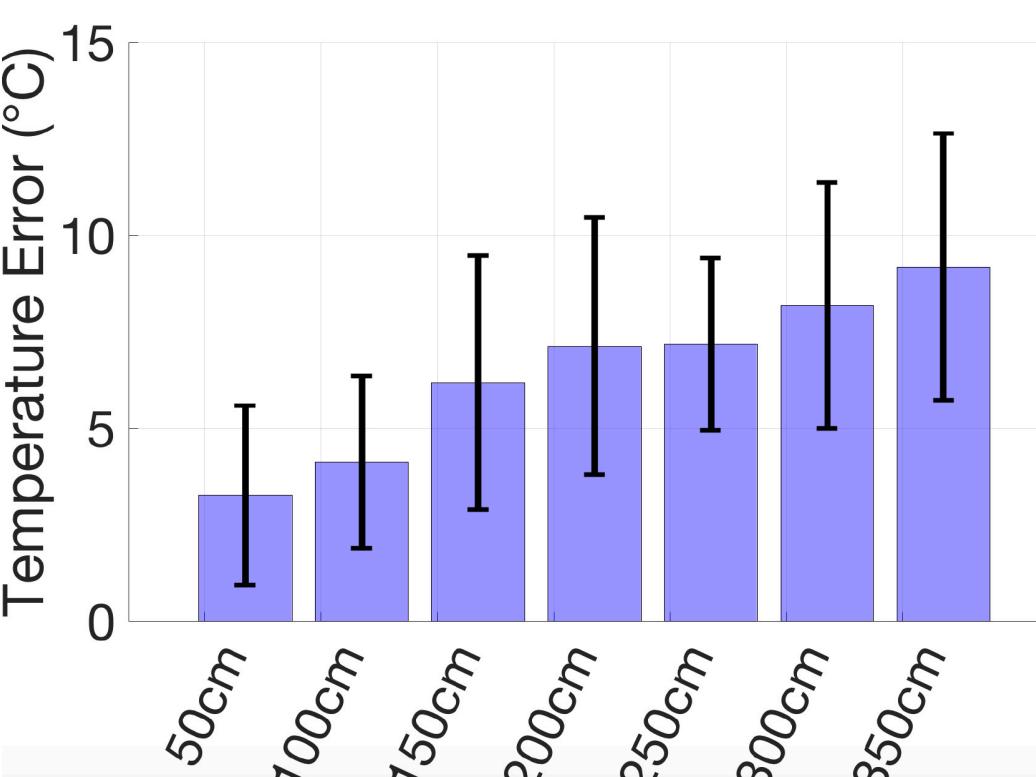
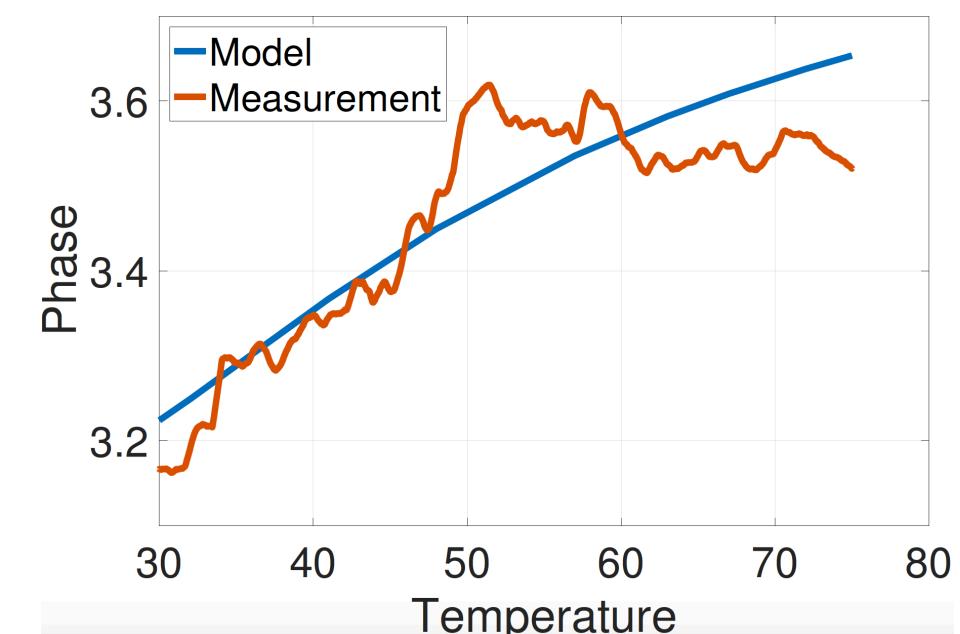


RTSENSE: TEMPERATURE SENSOR



Tag-pair design helps to mitigate impact of multi-path

EVALUATION



ISSUES

- Effect of multi-path
- Current range is limited (upto 5 m)
- Needs initial calibration

FUTURE DIRECTIONS

- Tag & protocol redesign for custom applications
- Wirelessly tracking ball movement dynamics
- RFID Tattoo for sensing of body parameters

