CPS: Medium: A Secure, Trustworthy, and Reliable Air Quality Monitoring System with Low-cost Sensors for Smart and Connected Communities

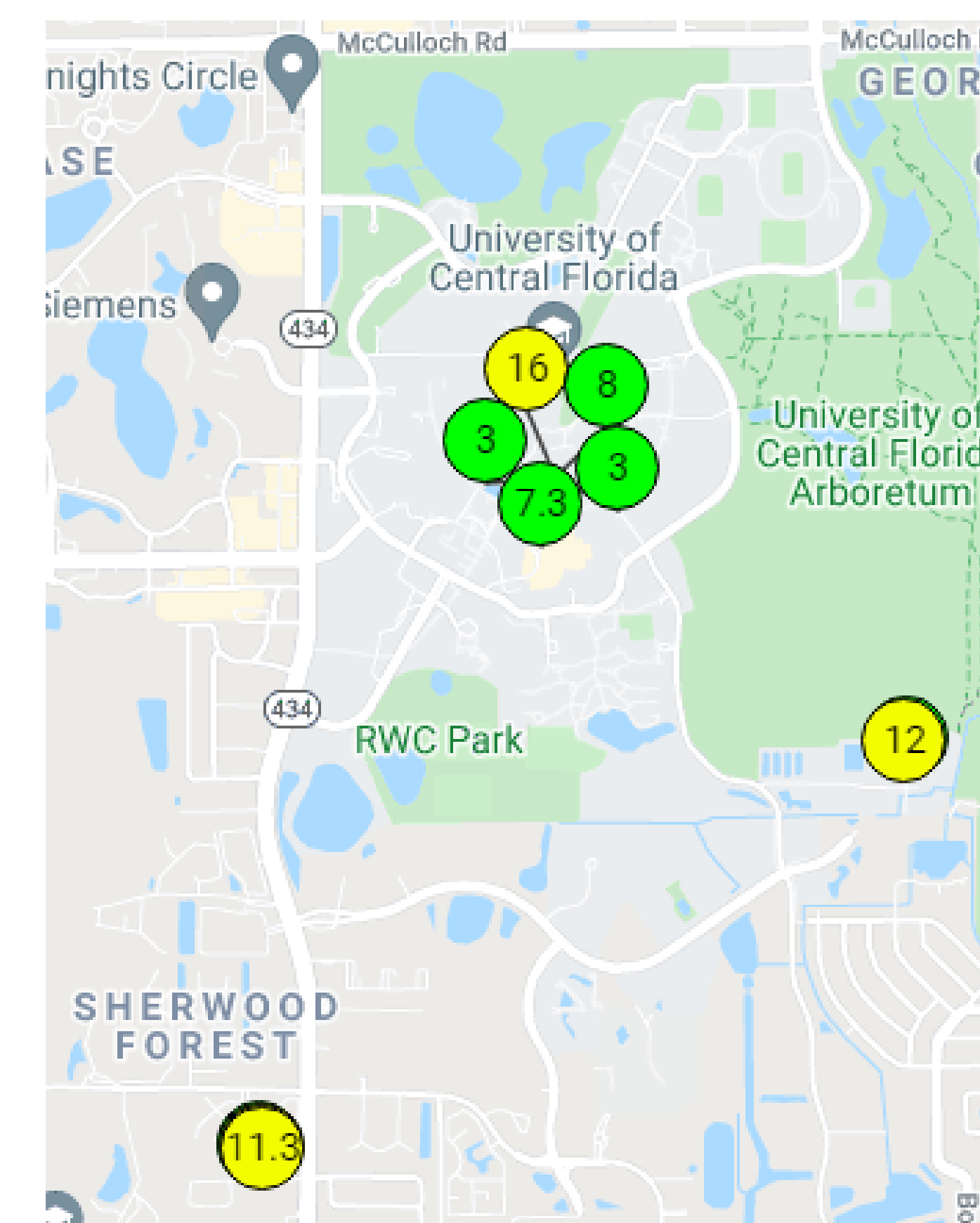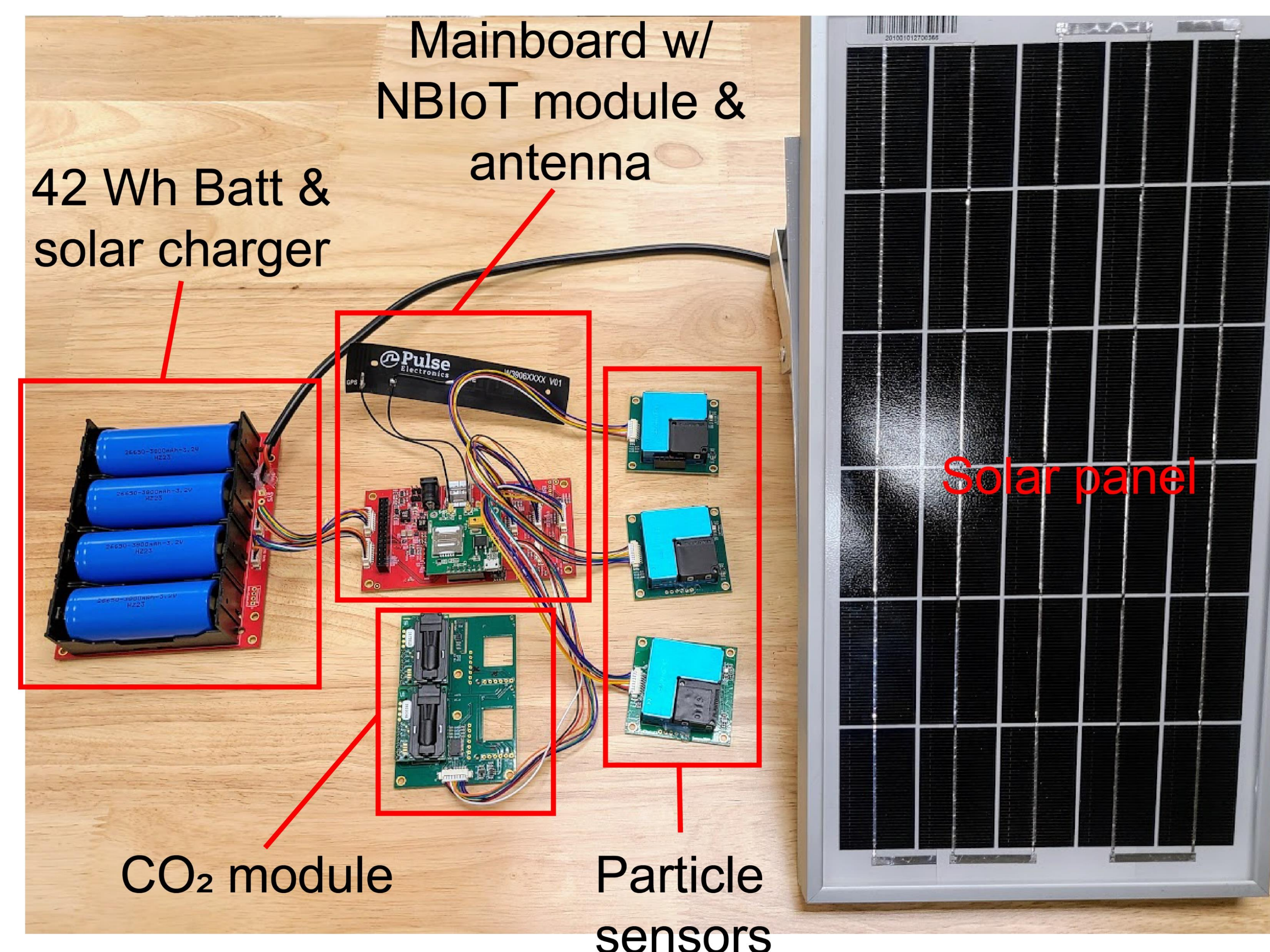Haofei Yu[a], Xinwen Fu[b], Deliang Fan[c], Kelly Stevens[a], Thomas Bryer[a]

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Challenge:

- Air pollution sensing quality
- Environmental IoT security
- Pollution data quality
- Citizen efficacy & trust in governance

Solution:

- Air model + multi-sensor for calibration & drift correction
- Arm TrustZone based security
- Two-stage deep learning over noisy data
- Four-stage framework to measure inclusion and trust of governance

Mainboard w/ NBIoT module & antenna
42 Wh Batt & solar charger
Solar panel
CO_2 module
Particle sensors

Scientific Impact:

- Better sensor data quality
- Secured environmental IoT
- Data-informed prediction
- Improve governance

Broader Impact:

- Pollution impact mitigation
- Public environ. education
- Broaden female/URM participation

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