Synergy: Collaborative: CPS-Security: End-to-End Security for the Internet of Things

- J. Adkins, B. Campbell, B. Ghena, N. Jackson, P. Pannuto, Prabal Dutta
- University of California, Berkeley (Collaborative w/ P. Levis @ Stanford)
- https://github.com/lab11/signpost | https://www.tockos.org/
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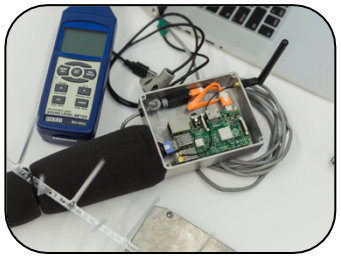
- CNS-1505684

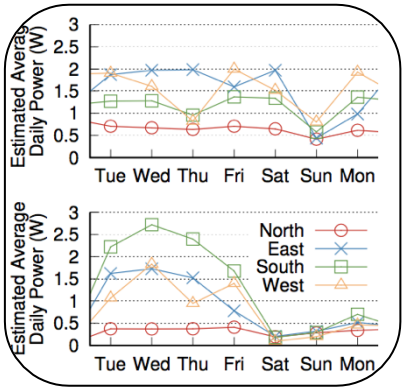
Signpost Sensors for Smart Cities

Lots of CPS interest in Smart City tech
- Array of Things (Argonne, U. Chicago)
- SONYC (NYU, Ohio State)

Current approaches
- Costly to deploy
- Require provisioning mains power
- Difficult for 3rd parties to extend



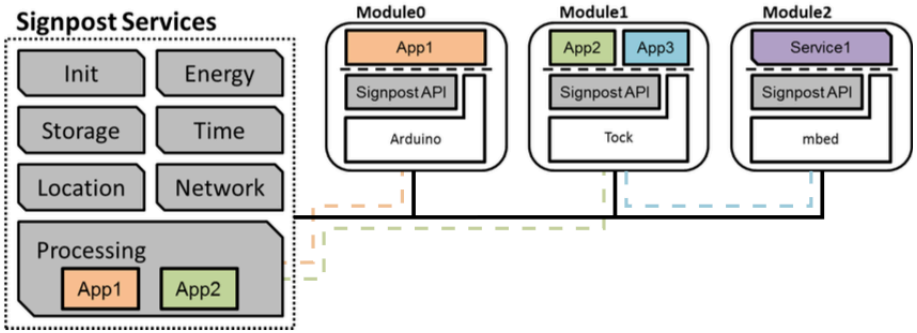
Thesis: Solar-powered *Signpost* Sensors
- Are inexpensive and easy to deploy
  - Mount in minutes with 2 bolts
- Can operate from harvested energy
  - 200 mW – 2 W average power
- Could be extended by 3rd parties
  - Smart backplane + modular sensors



Findings from a Signpost Deployment

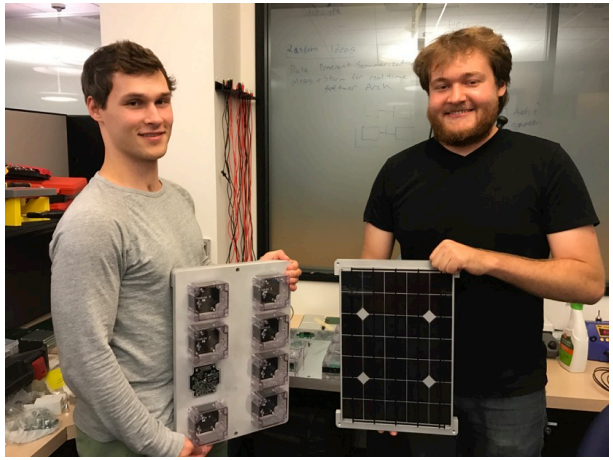
It works! At scale of 10+, anyway!

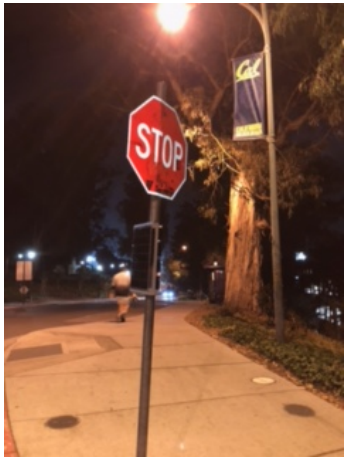
- No vandalism in heavy pedestrian area
- Energy-adaptive, round-the-clock ops
- Communicates over LoRa and cellular
- Modularity facilities flexible modalities
- New OS (Tock) supports app isolation

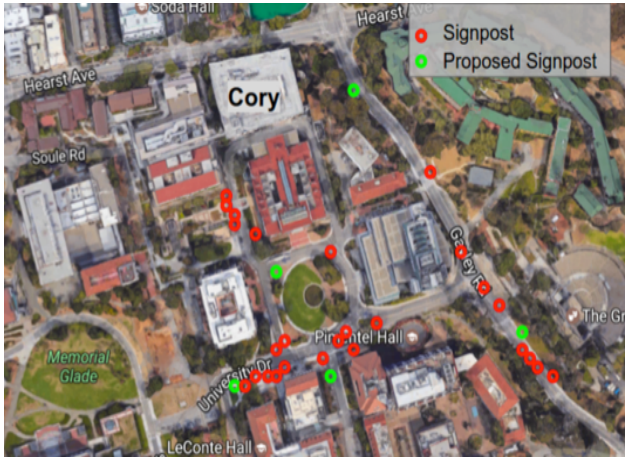


RF Spec. | Comms | Power | Air Qual.

Environ. | Compute | Audio | Radar







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