



IP CREW

Cognitive Radio Experimentation World

The w-iLab.t testbed

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heterogeneous, generic testbed for wireless (cognitive) networks

- sensor and actuator networks
- Wi-Fi based wireless ad-hoc/mesh/vehicular

2 testbed locations

- office: three office floors of 90m x 18m [200 nodes]
- "pseudo-shielded", Zwijnaarde: [60 nodes]

"node" = embedded PC + multiple interfaces + sensor node

19 280+ experiments were scheduled since 2008



generic testbed





Pseudo-shielded environment





facts and figures



office testbed



Zwijnaarde testbed

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TMote Sky & IBBT-Rmoni

- Sensors for light, temperature, and humidity
- 802.15.4 radio

Specifications available on www.crew-project.eu/portal







Hardware – embedded PCs





Specifications available on www.crew-project.eu/portal







Hardware: testbed architecture









functionality includes:

- emulation of sensor input
 - analog / digital inputs and outputs
- battery emulation
 - use: e.g. emulate depleting battery, energy harvesting
 - avoid replacing real batteries
- measure power consumption



www.crew-project.eu/portal



Cognitive components: imec sensing





- real-time and post experiment spectrum information
- 10 scanning engines, distributed at the Zwijnaarde location



Cognitive components (2)











- USRP2 / USRP N210 devices (facilitate SDR radios)
- dual band 2.4 GHz / 5 GHz ISM daughter boards



"Cheap" sensing: Airmagnet Spectrum XT









Hardware overview as available on CREW portal



http://www.crew-project.eu/portal/schematic-overview





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user interface – demo









w-iLab.t allows automation of experiments

- automatic collection, processing & analysis of test results:

- 1.state of the testbed,
- 2.state of wireless environment
- 3.state of solution under test

more info: white paper on benchmarking http://www.crew-project.eu/documents

example implementation available on the CREW portal





• sensor nodes (802.15.4) nodes only

- flash firmware
- {collect, process, visualize, analyze} results

embedded PC with Wi-Fi / Bluetooth interfaces

- configure device (protocols, drivers, kernel,...)
- {process, visualize, analyze} results

cognitive components

- imec sensing, USRP (Iris)
- combined experiments





w-iLab.t

- actively used
- Hardware and tested tools
- 802.15.4 sensor networks, Wi-Fi based networks, Bluetooth
- cognitive components: sensing and SDR

support for heterogeneous experiments

advanced functionality

- environment emulator
- analyzer / visualizer
- benchmarking







Questions?







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