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CROSS-BORDER COOPERATION
IN THE MEDITERRANEAN

FruitFlyNet

A Location–aware System for Fruit Fly Monitoring and Pest Management Control

DELTA E-TRAP

CREA-FRU

Eng. Armando Amore

Volos, Greece, Dec. 2015

Agricultural
University
of Athens

Universitat de les
Illes Balears

The target

- Monitor the Ceratitis Capitata in a peach orchard
- Optimize treatments
- Reducing technician visit in the field

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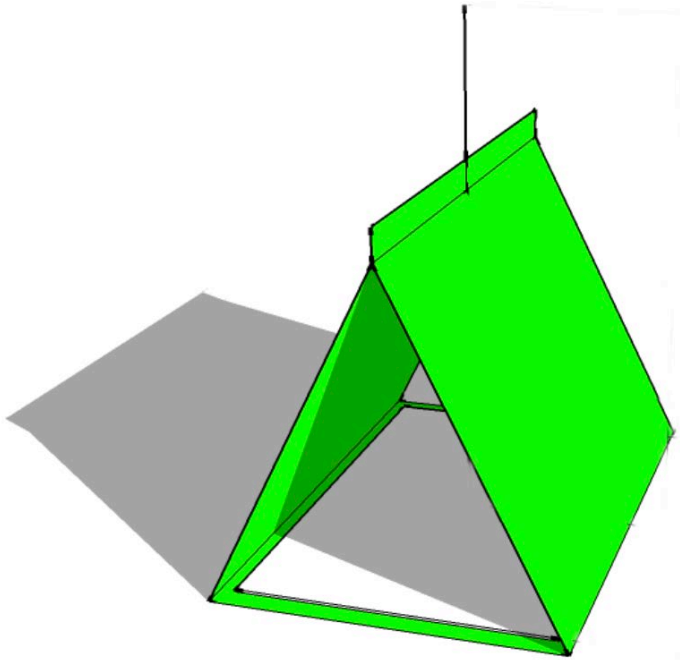
The Trap: Delta or Jackson

Conventional



E-Trap

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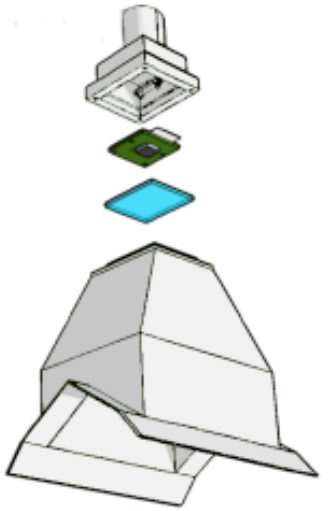
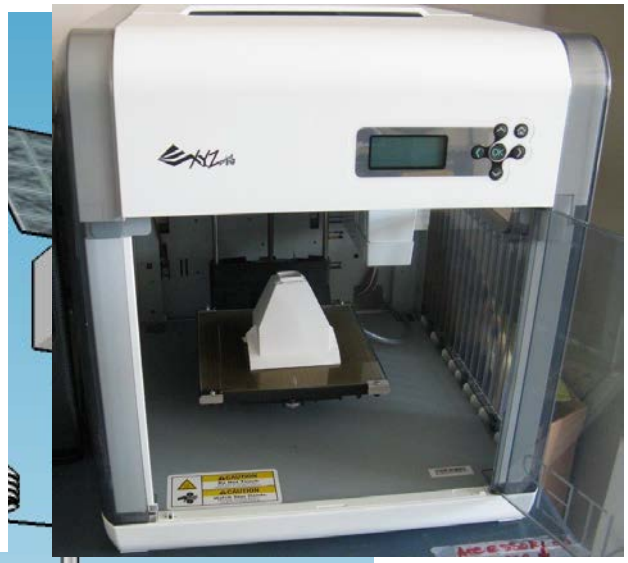
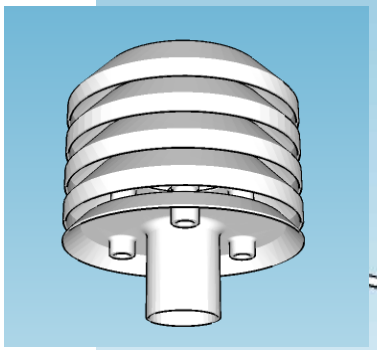
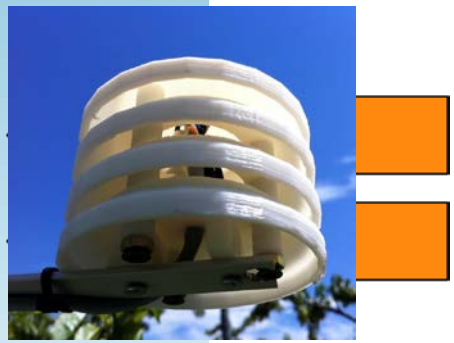
The prototype









Volos, Greece, Dec. 2015

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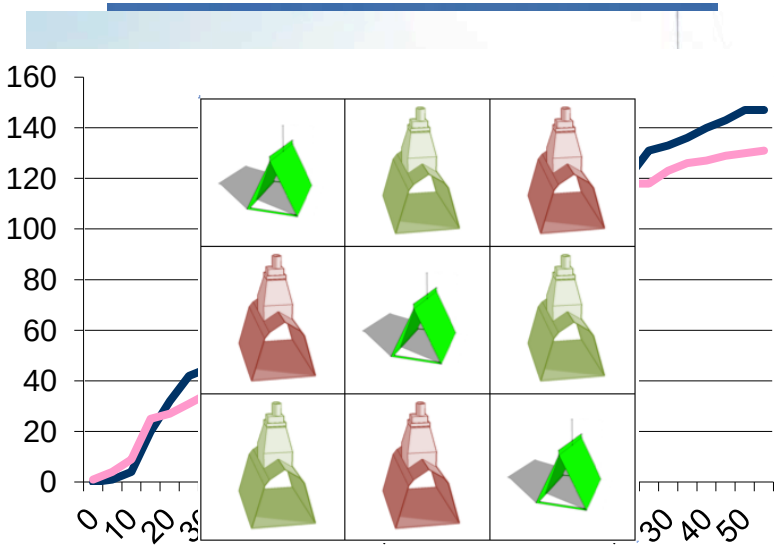
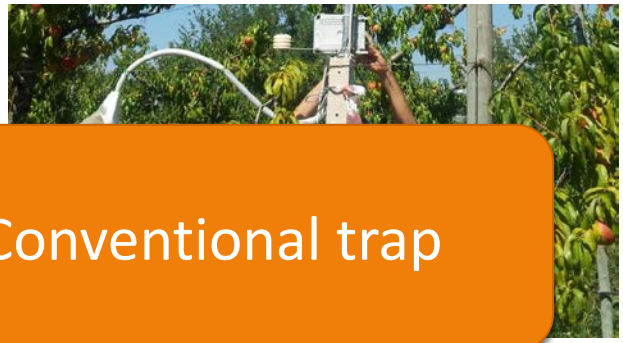
E-Trap efficiency test

- Latin square 3x3 test
  - Conventional trap
  - E-Trap with full sticky surface
  - E-Trap with reduced sticky surface
- Laboratory test in Israel
  - E-Trap vs Conventional
  - Male and Female capture
- On field test in Italy





The E-Trap is **AS EFFICIENT AS** the Conventional trap

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Operational Layout

TRAPS

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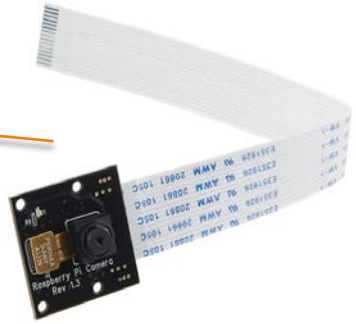
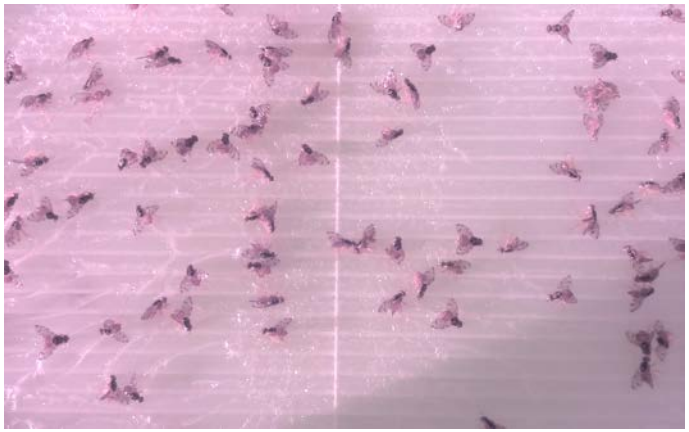
Operational Layout

TRAPS





High Resolution Image

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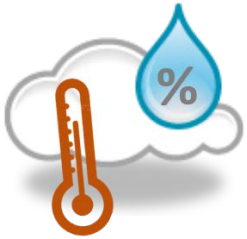
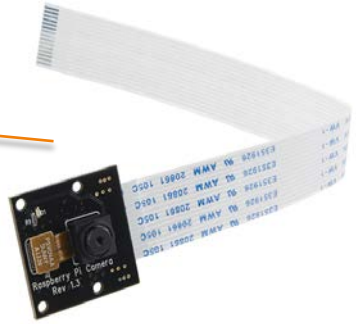
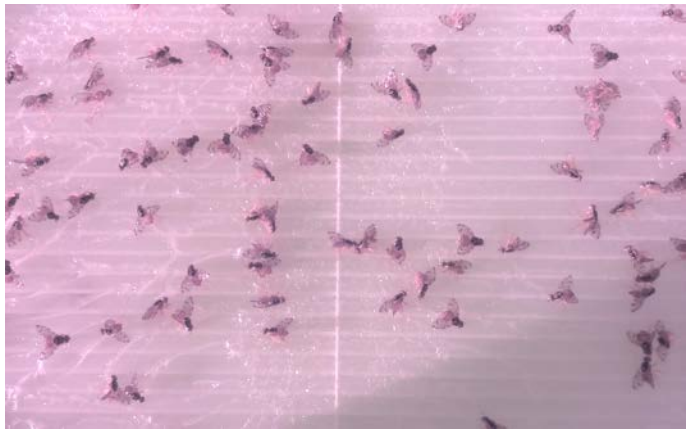
Operational Layout

TRAPS



Air Temp. / RH





High Resolution Image

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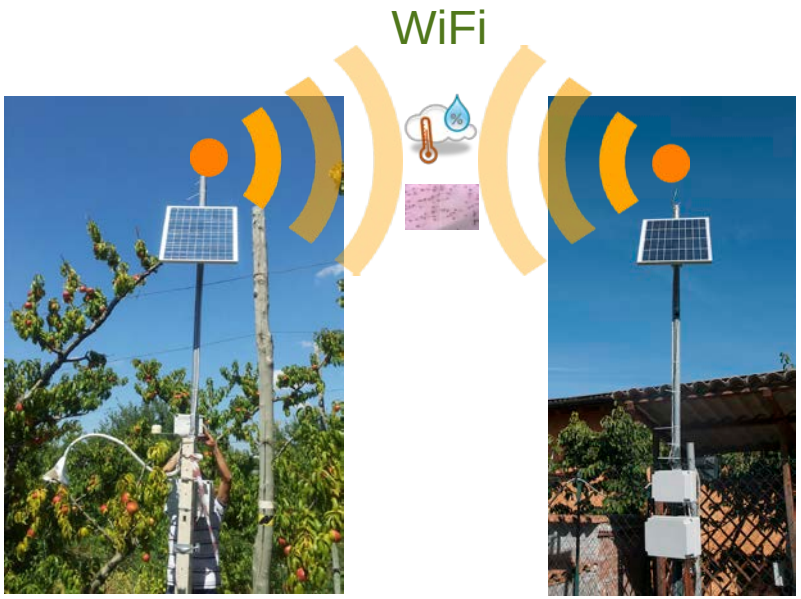
Operational Layout



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Operational Layout

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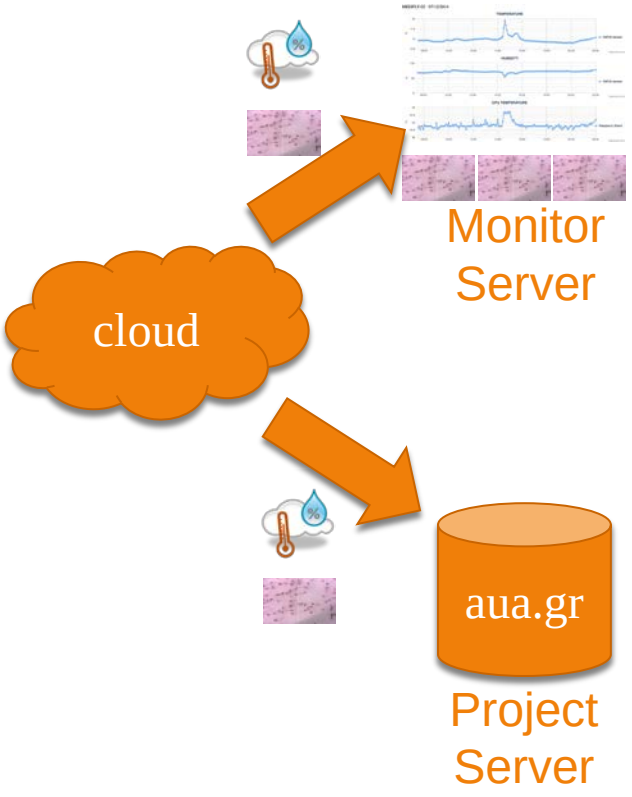
TRAPS

ROUTER



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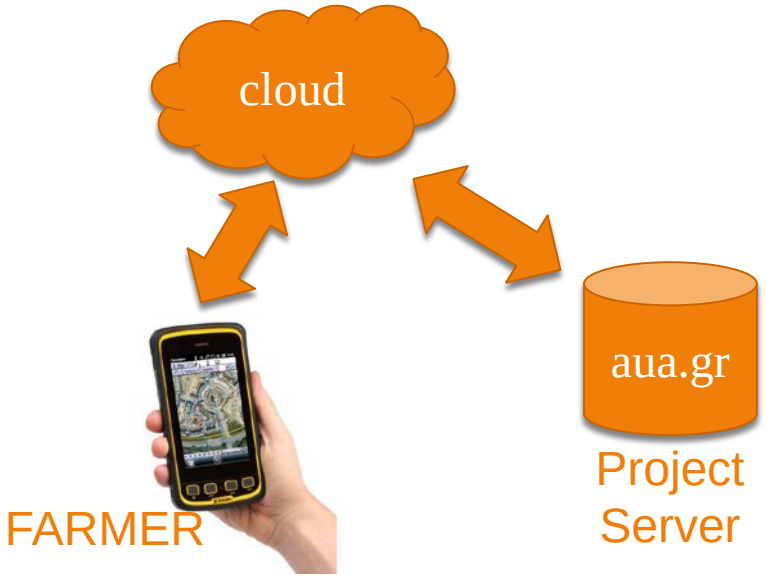
Operational Layout

TRAPS

ROUTER



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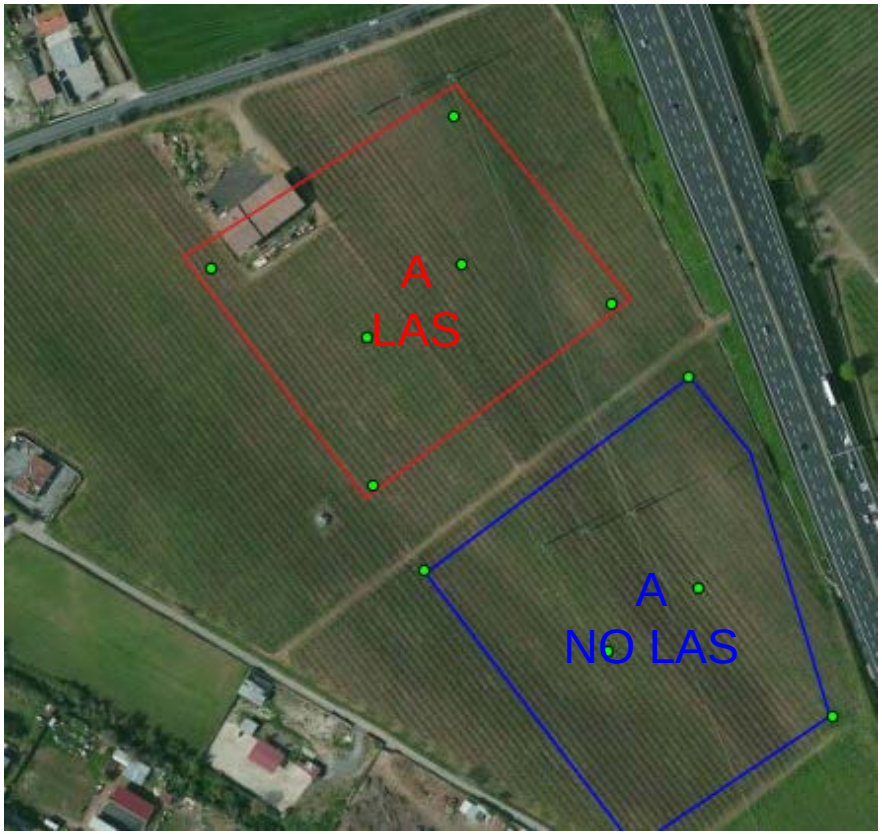
Field Communications



- PILOT SITE 1
  "Verbesi" Peach Orchard
  - BLOCK A
    - LAS
    - NO LAS

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Field Communications

- 6 E-Traps

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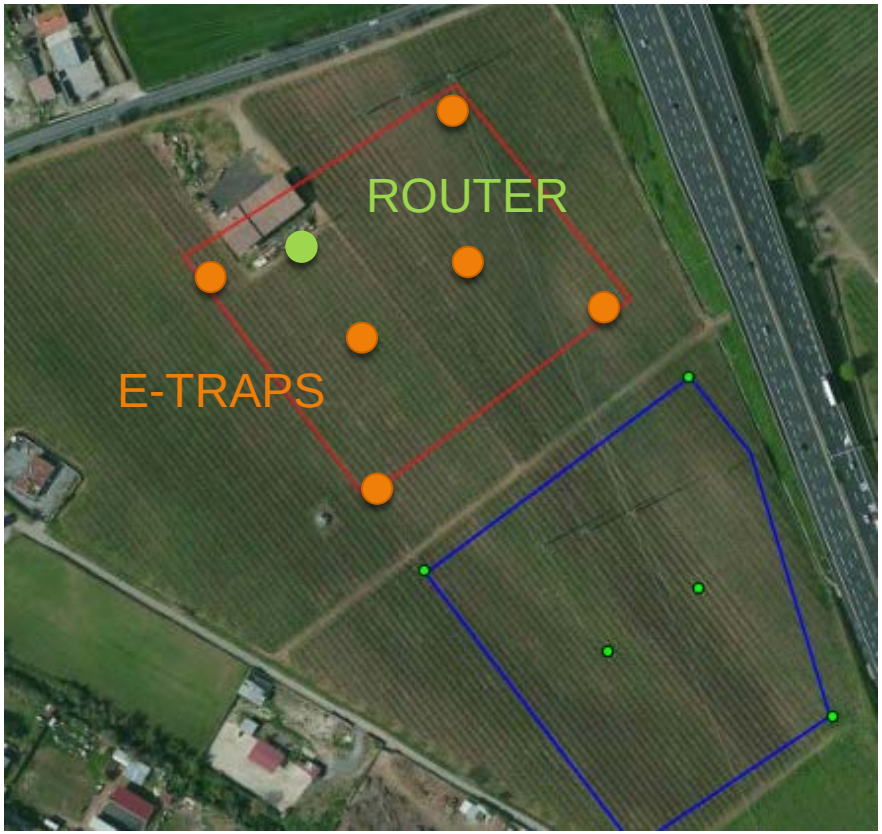
Field Communications



- 6 E-Traps
- 1 GATEWAY-ROUTER

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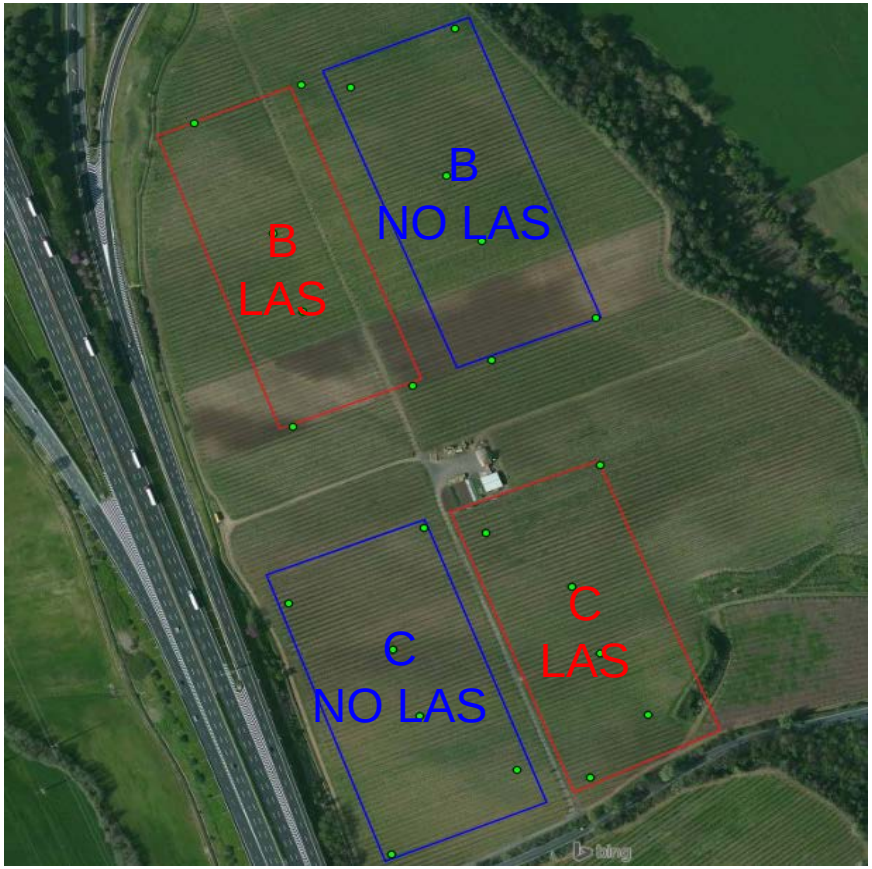
Field Communications



- PILOT SITE 2
  "Verbesi" Peach Orchard
  - BLOCK B
    - LAS
    - NO LAS
  - BLOCK C
    - LAS
    - NO LAS

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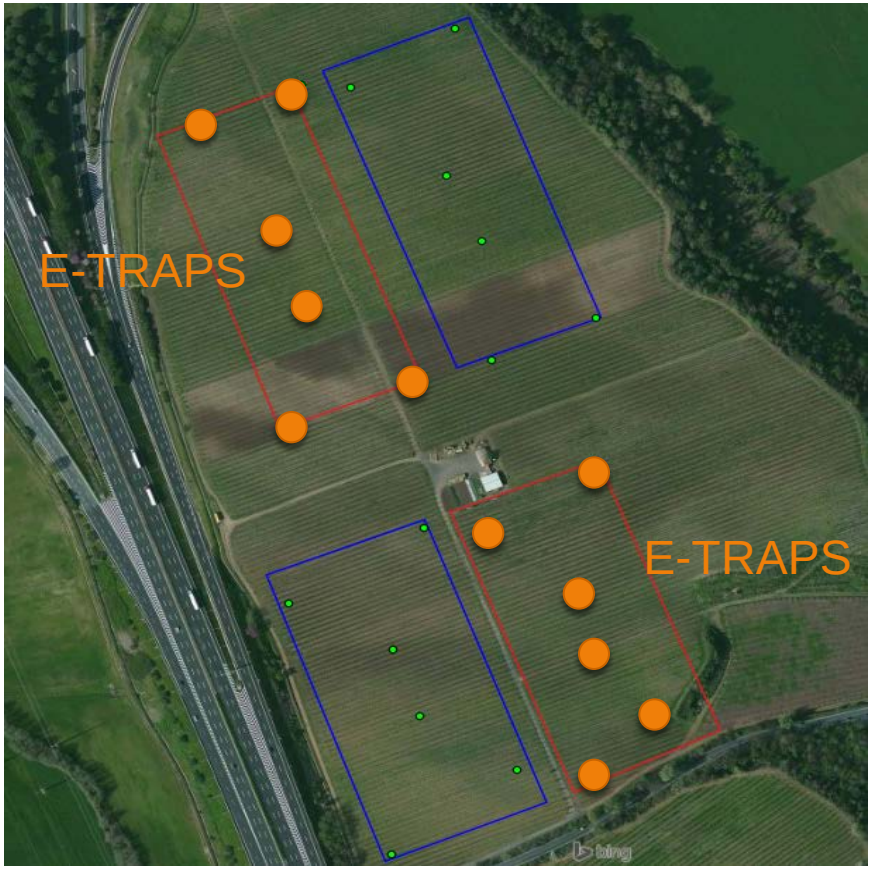
Field Communications



- 6 E-Traps B LAS
- 6 E-Traps C LAS

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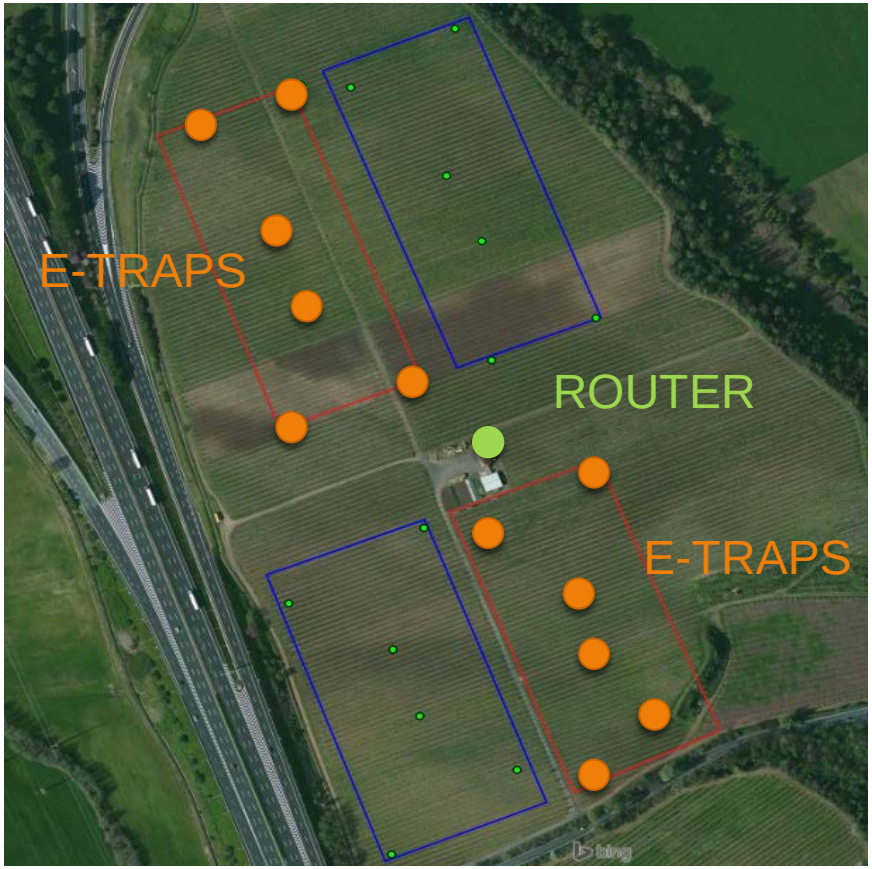
Field Communications



- 6 E-Traps B LAS
- 6 E-Traps C LAS
- 1 GATEWAY-ROUTER

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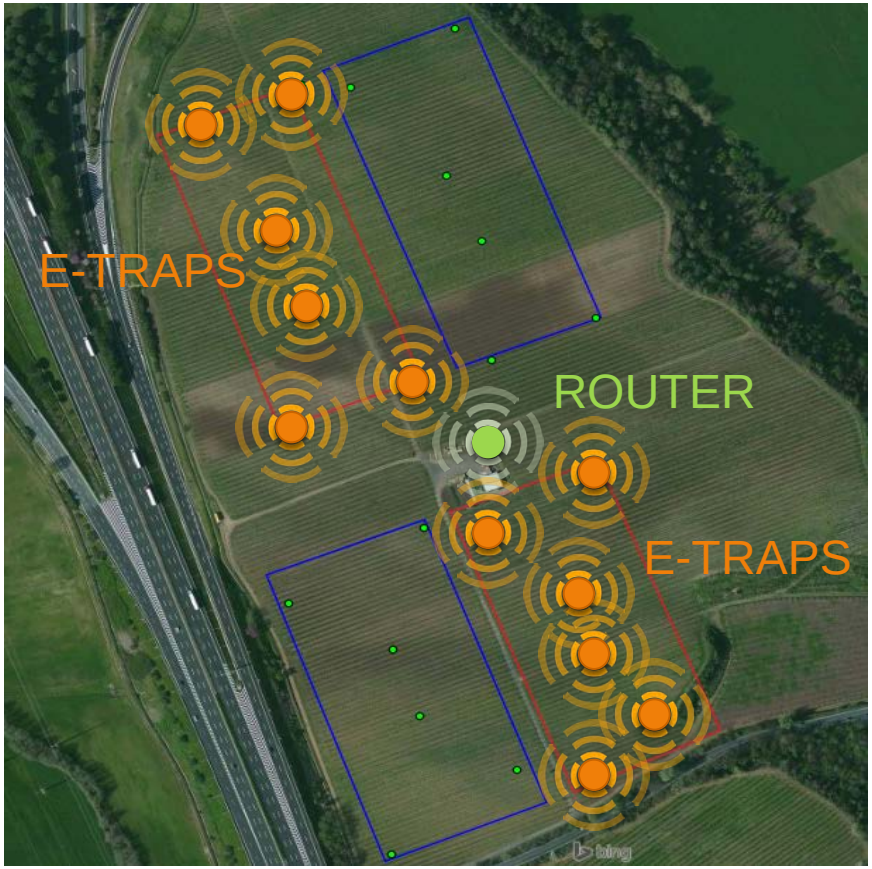
Field Communications



- 6 E-Traps B LAS
- 6 E-Traps C LAS
- 1 GATEWAY-ROUTER

- Each node communicates with the neighbors over WiFi

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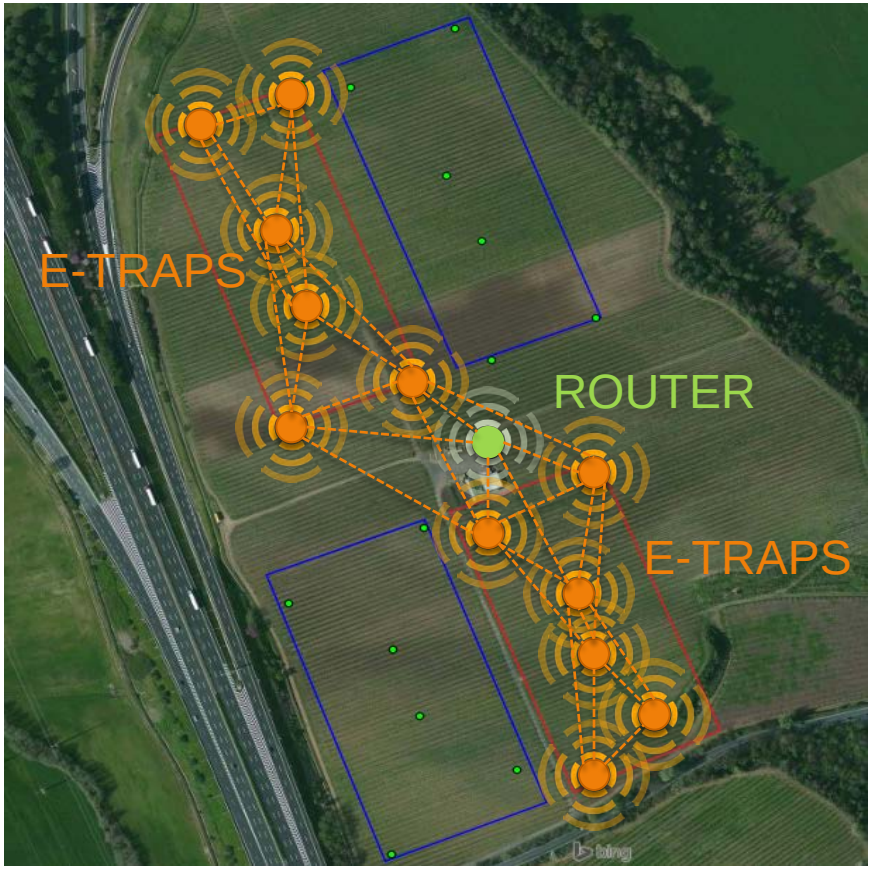
Field Communications



MESH TOPOLOGY

- PROS:
  - Different routes from trap to router
  - High fault tolerance

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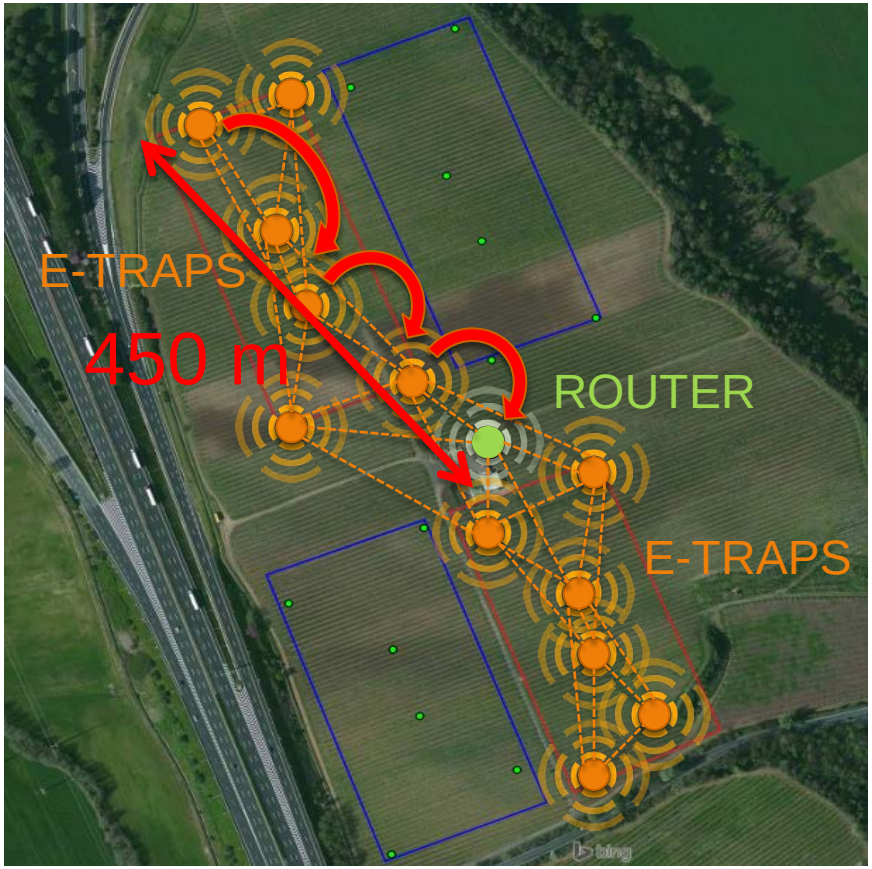
Field Communications



MESH TOPOLOGY

- PROS:
  - Different routes from trap to router
  - High fault tolerance
  - Long distance coverage with multi-hop communication using small antennas

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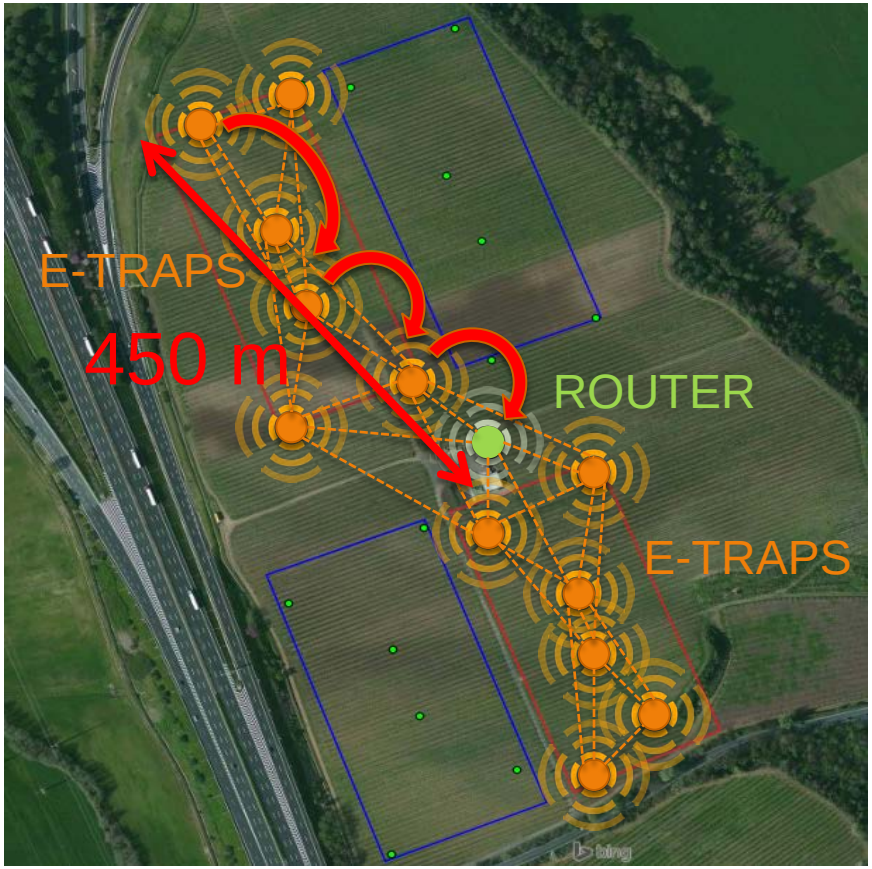
Field Communications



MESH TOPOLOGY

- PROS:
  - Different routes from trap to router
  - High fault tolerance
  - Long distance coverage with multi-hop communication using small antennas
- CONS:
  - Nodes must be always on
  - Higer power needs

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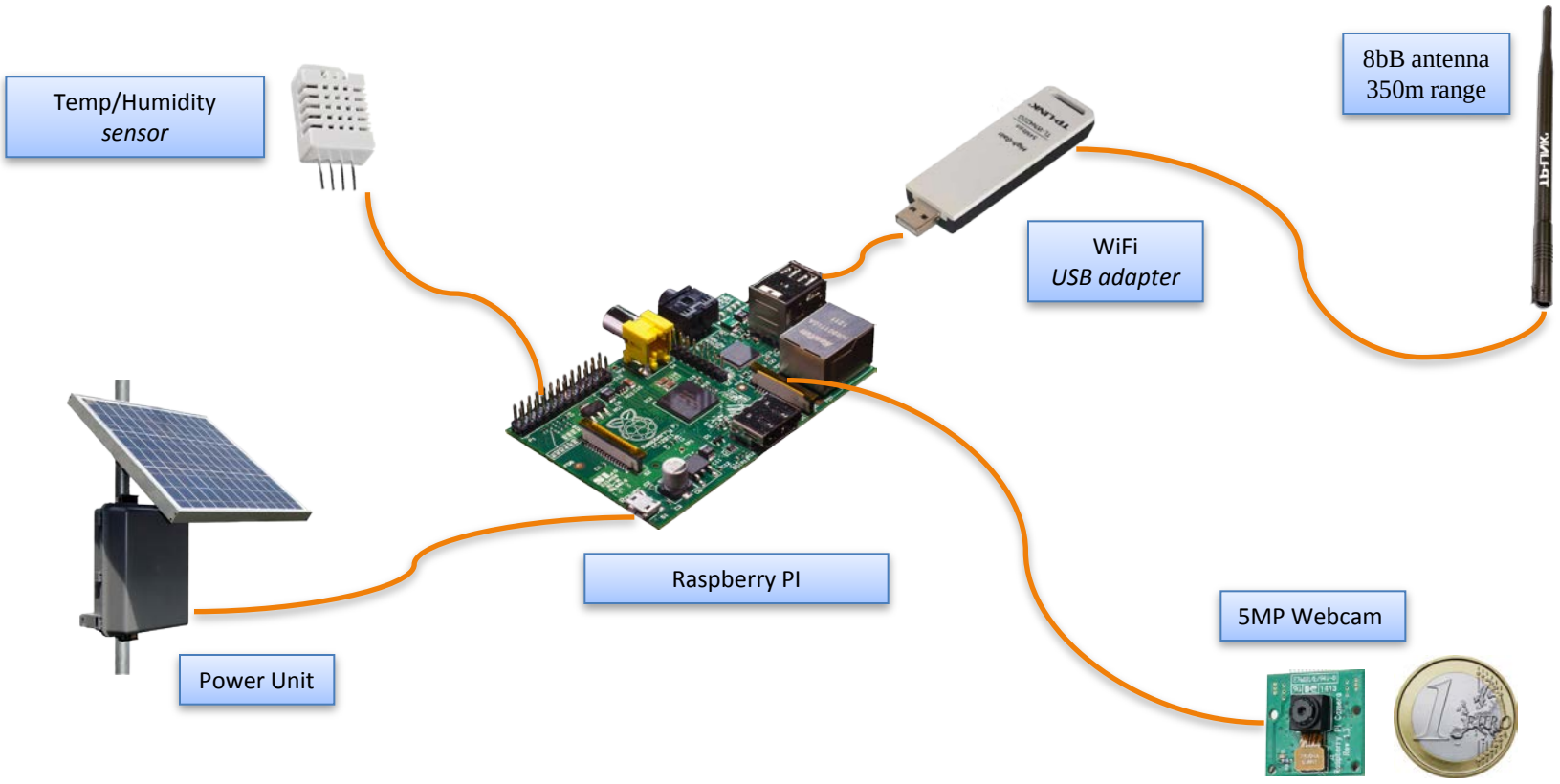
Inside the E-Trap



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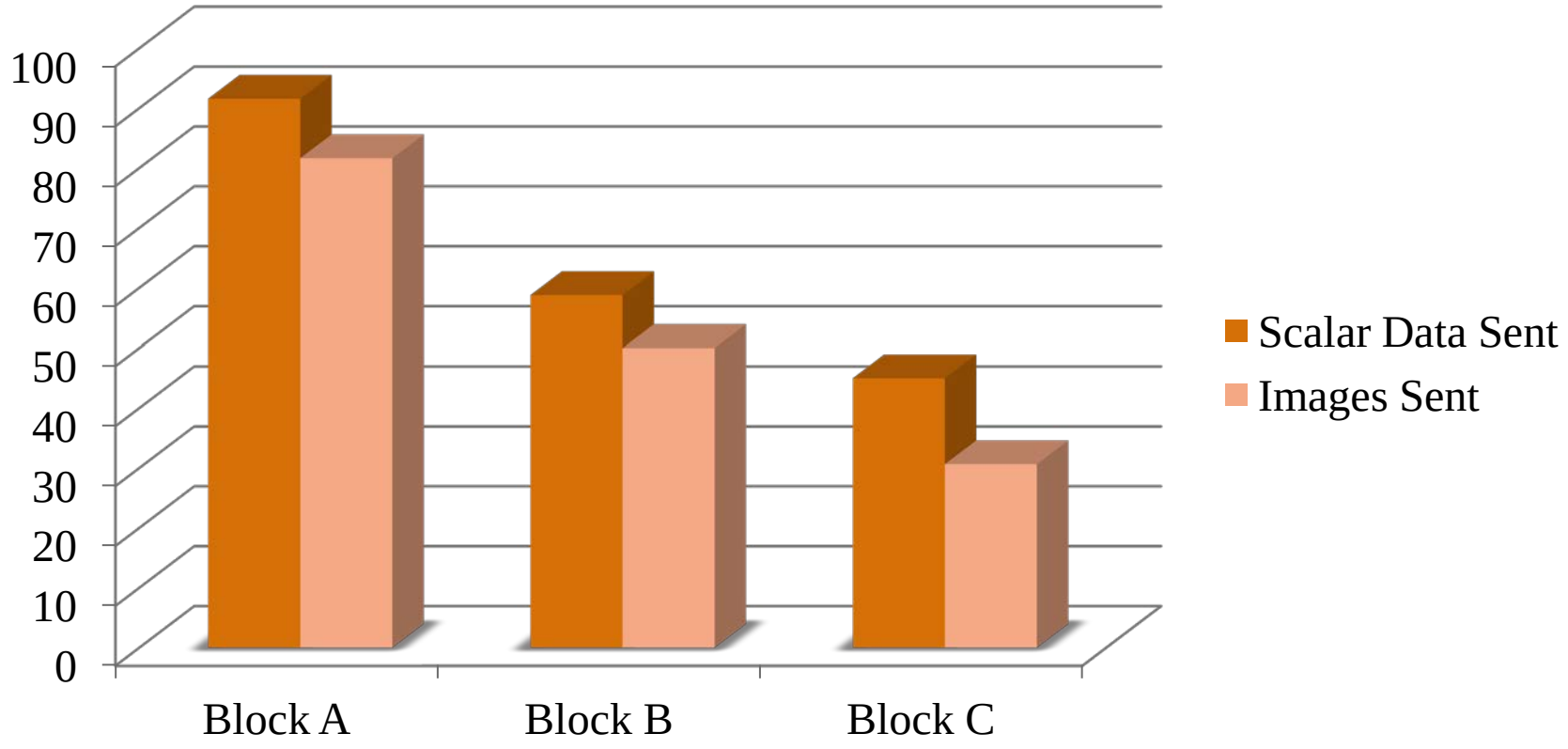
E-Trap functionality



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Numbers

- 18 E-Traps and 2 Router installed
- 1740 images sent from the E-Traps
- 108.000 scalar data (Temperature/RH) sent

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Final considerations

Achievements

- Cheap transmission cost
- Real-Time data availability
- Real-Time hardware monitoring
- Real-Time picture on request

Drawback

- Improve e-trap design
- Improve power consumption
- SD Card damages after about 2000hr
- Reduce the number of traps per mesh network

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Thank you!!!

FruitFly Net

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

UNIVERSITAS STUDIORUM MOLISII SCIENTIARUM AUGMENTIS REIPUBLICAE UTILITATI

Volos, Greece, Dec. 2015

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