



ICT for Sustainability

Prof. Giuseppe Anastasi

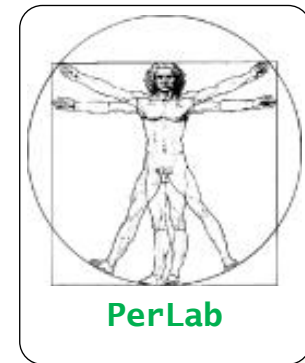
Pervasive Computing & Networking Laboratory (PerLab)

Dipartimento di Ingegneria dell'Informazione

Università di Pisa

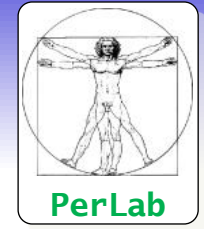
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My Research Activity

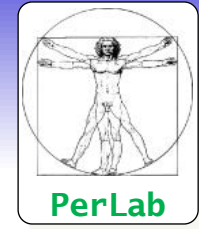


- Internet (and ICT) for
 - Smart home/office/factory
 - Energy efficiency in homes/buildings
 - Environmental sustainability
 - Cities and Citizens





SmartBuildings



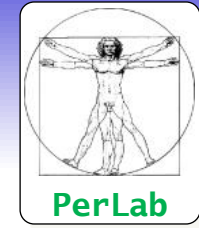
An Ambient-Intelligence System for Energy Efficiency in a Complex of Buildings

- Funding Agency: Regione Sicilia
- Start: September 19, 2011
- End: September 18, 2013
- Partners: UniPa, UniPi, Gruppomega, Easy, FGT





PC Energy Consumption



- PCs left on for
 - Laziness, Omissions, ...
 - It is no so important
 - It takes some time and I am always in a hurry
 - I simply forget to power off
 - I don't want to lose my work
 - Nobody else turns PC off , so ...
 -

8 h ×

5 days ×

52 weeks ×

100 W /

1000 =

208 kWh/year

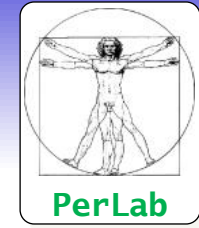
$$208 \text{ kWh} \times 0,17 \frac{\text{€}}{\text{kWh}} \sim 35,36 \text{ €}$$

- PCs left on for maintaining connectivity
 - Remote login
 - Automatic software upgrades
- PCs intentionally left on for network applications
 - E.g., P2P file sharing applications





PC Energy Consumption



- PCs left on for
 - Laziness, Omissions, ...
 - It is not so important
 - It takes some time and I am always in a hurry
 - I simply forget to power off
 - I don't want to lose my work
 - Nobody else turns PC off, so ...
 -

24 h ×

7 days ×

52 weeks ×

100 W /

1000 =

873,6 kWh/year

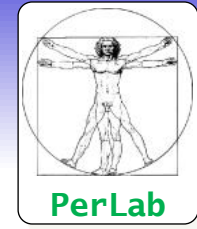
$$873,6 \text{ kWh} \times 0,17 \frac{\text{€}}{\text{kWh}} \sim 148,50 \text{ €}$$

- PCs left on for maintaining connectivity
 - Remote login
 - Automatic software upgrades
- PCs intentionally left on for network applications
 - E.g., P2P file sharing applications

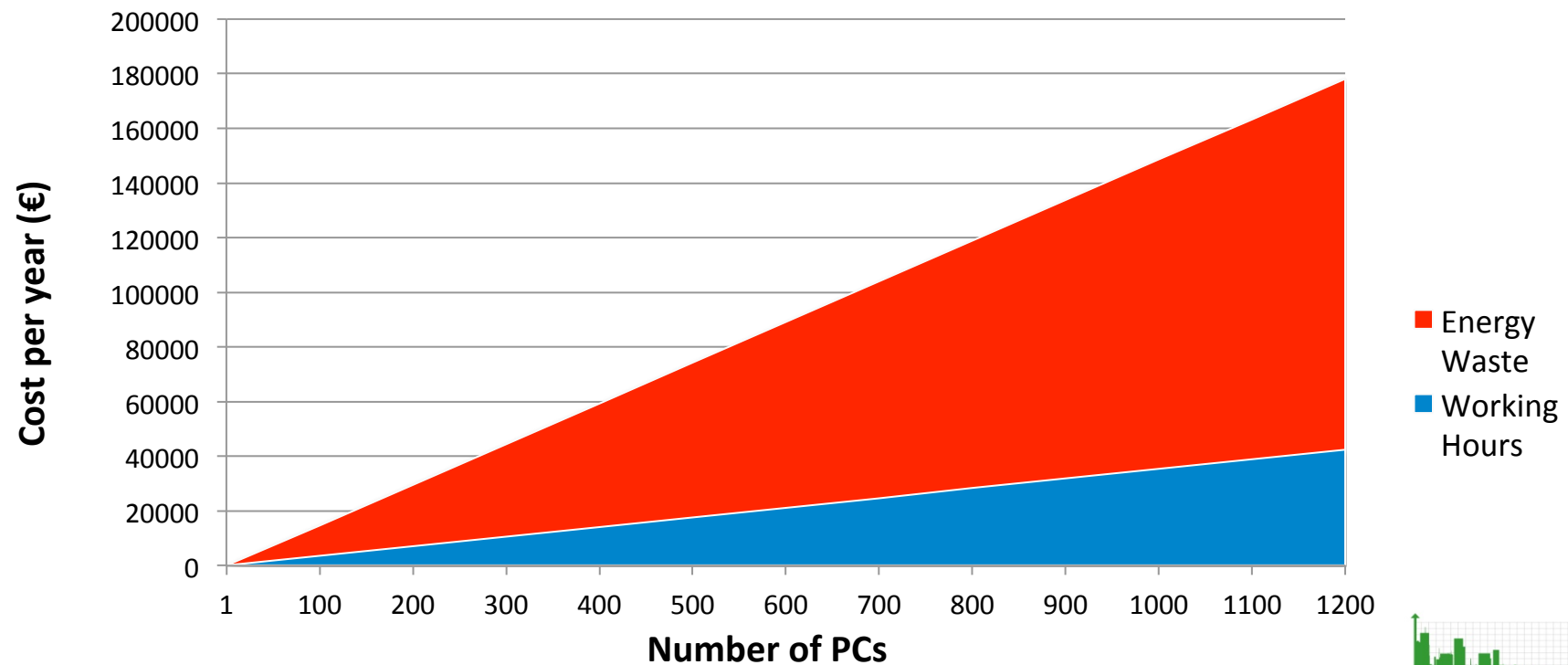




PC Energy Consumption

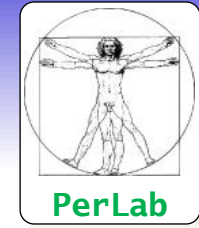


- Energy waste (and costs) increase with the # of PCs

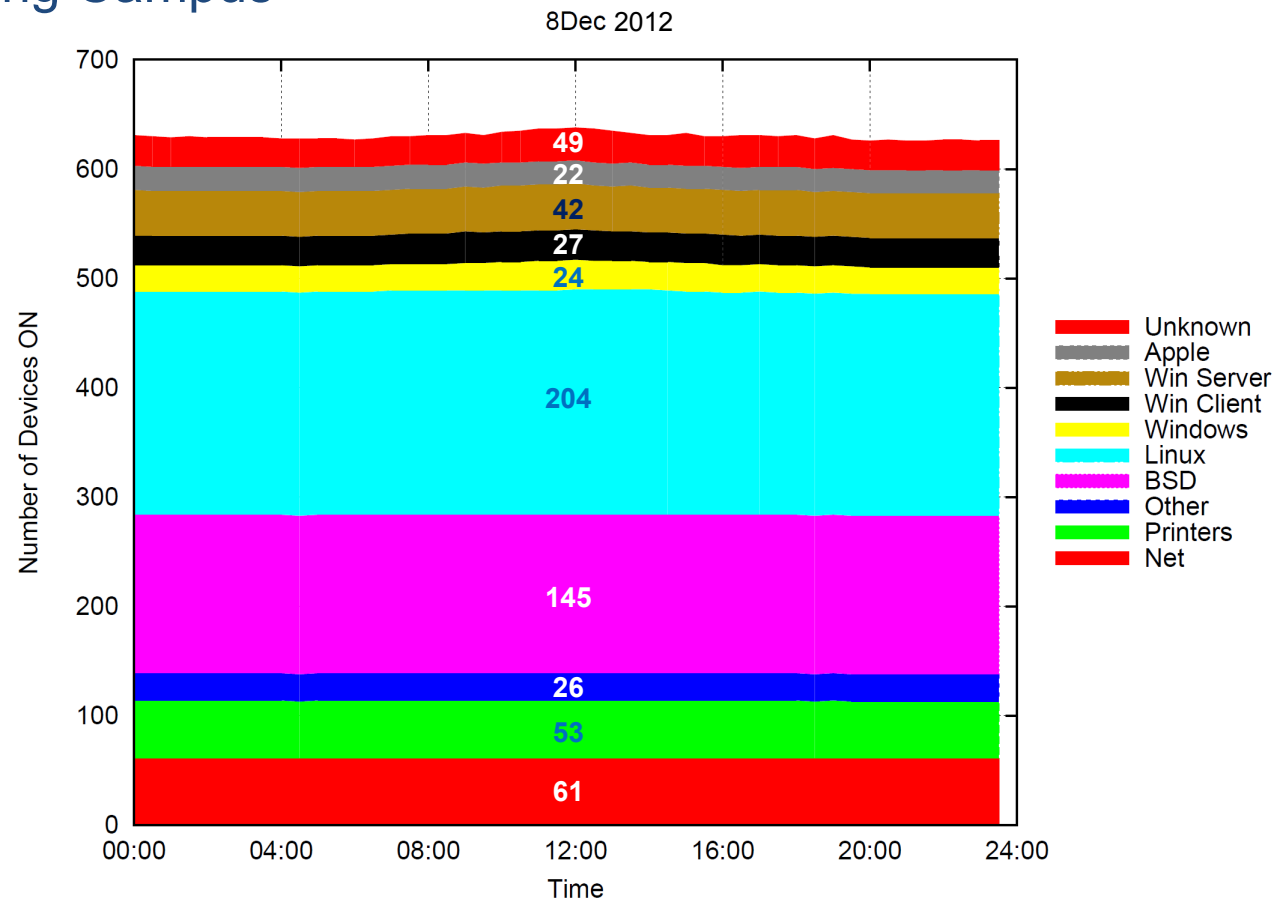




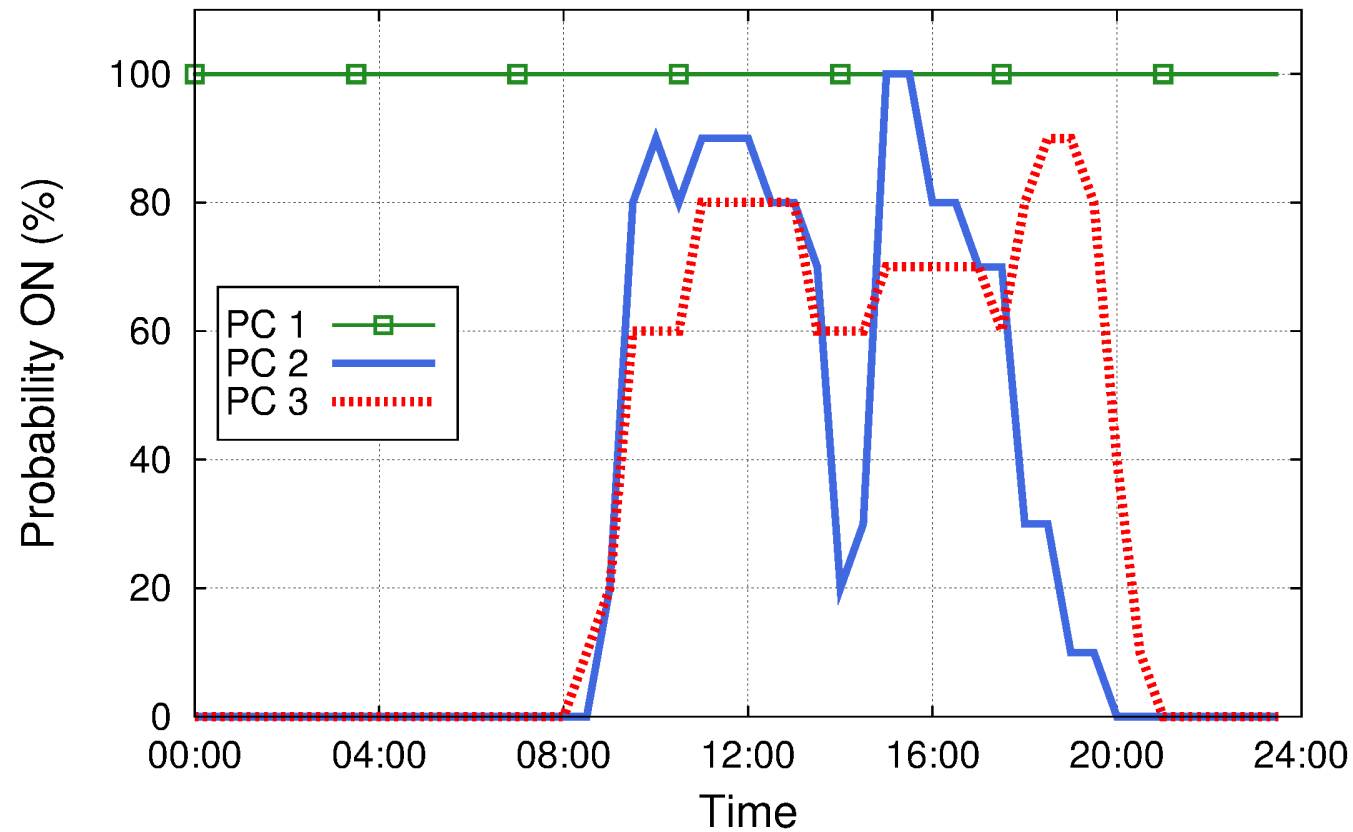
Active PCs in a Holyday



Engineering Campus



PC Usage Profile



E-NET-Manager

Host	OS	Suspend	Activate
PC1	Windows XP	19:00	8:25
PC2	MacOS	17:00	7:00
PC3	UNIX	24:00	10:55

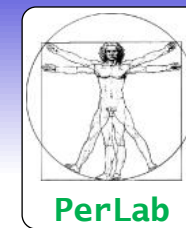


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E-NET-Manager



[Logout](#)

Welcome,
pippo



[Check and control
the status of your PCs](#)



[View and change
the control rules](#)



[Create usage
statistics](#)



[Settings](#)



Your PCs



Refresh

Legend:   
Switch on Sleep Power off



PC Name:
Fisso_Illaria

Status: **Online**

Available operations:



PC Name:
PC_Windows

Status: **Offline**

Available operations:



PC Name:
PC_Perlab

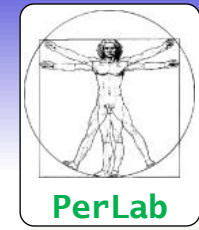
Status: **Offline**

Available operations:





SMARTY



SMART Transport for a sustainable city

- Funding Agency: Regione Toscana
- Start: October 1, 2012
- End: December 31, 2014
- Partners
 - Softec, Bassilichi, Almaviva, KTT
 - Università di Pisa, Università di Firenze

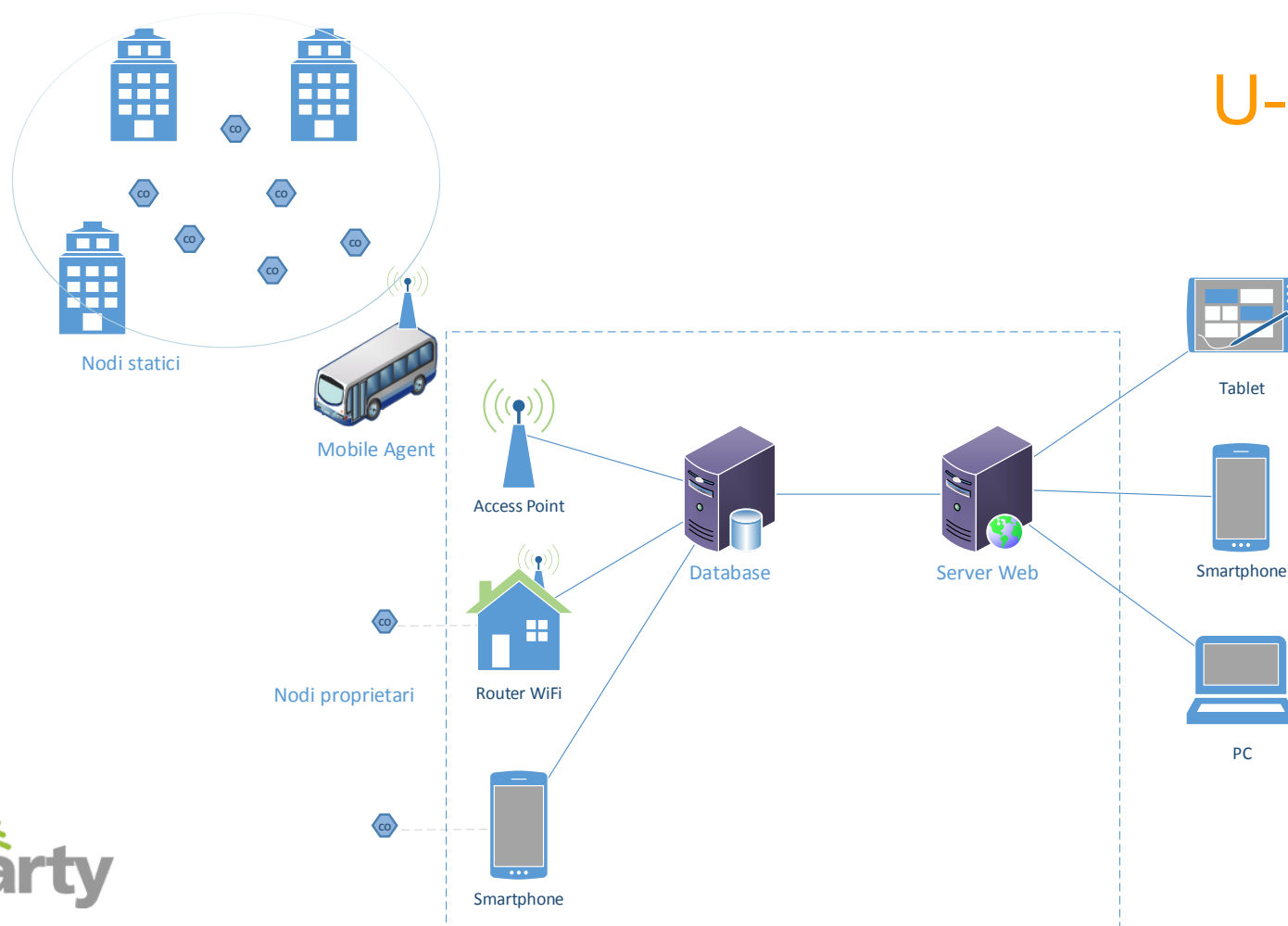




Cooperative Urban Sensing



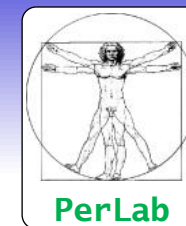
U-Sense



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U-Sense

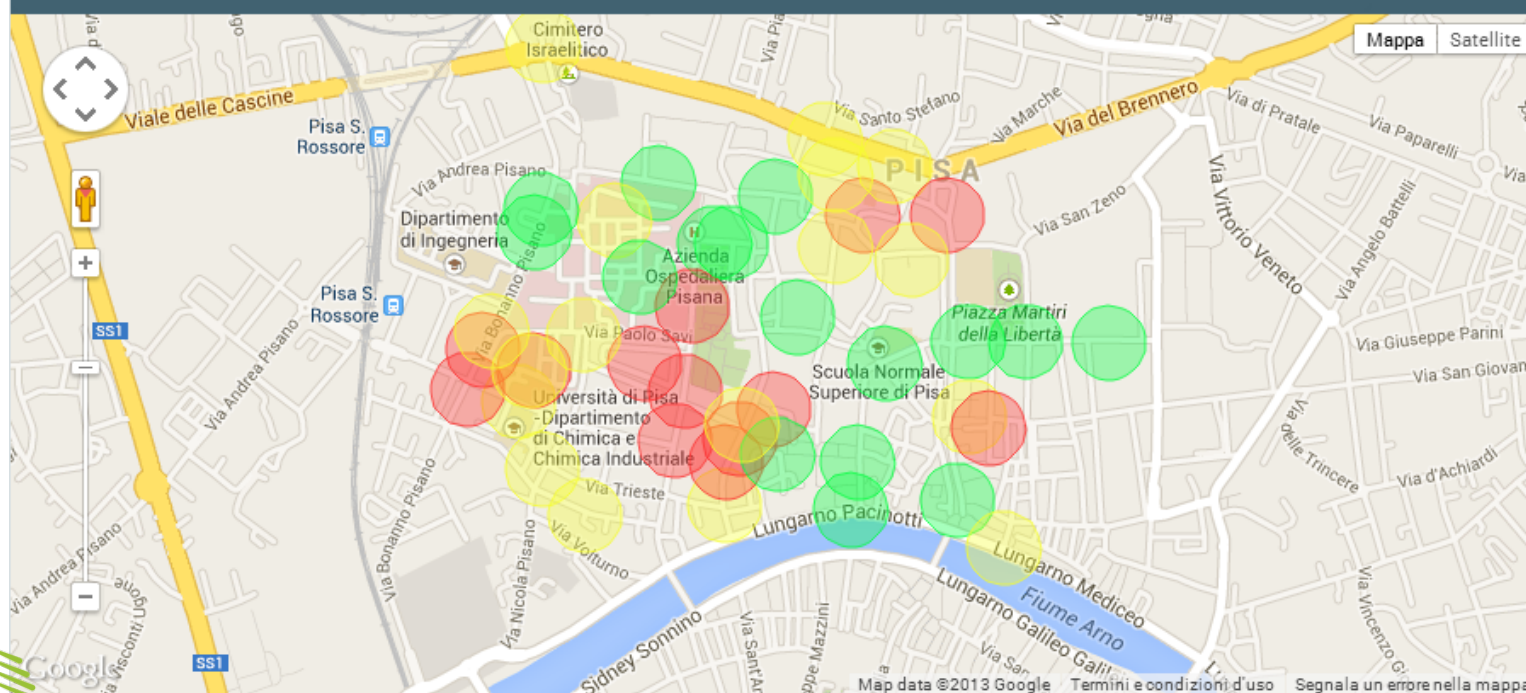


U-sense

Nome utente

Log In

Home Mappa dei Sensori Ricerca Percorso Zone di Inquinamento U-sense



smarty

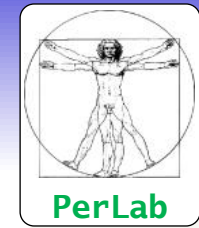
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