W/BO project

Wi-Fi over AIBO

2005-2006

RÉANT Gilles
French Erasmus student

Summary

- aims of the project
- project review
- tools used
- evolution of the algorithm
- result
- demonstration
- problems encountered
- next
- questions

Aims of this project

see what's possible using Wi-Fi & the AIBO

- which equipment is compatible?
- what can we do?
- security?

Aims of this project

the W/IBO project in itself

~~Wi-Fi sniffer~~

Open-R SDK

another idea

finding the access point to which it is connected

Aims of this project

report

- good start for using the AIBO
- avoiding the inappropriate SDKs
- setting-up a connection between a computer & AIBO
- starting doing basic movements
- in 2 hours

Project review

Work from October 2005 to April 2006

- AIBO
- Wi-Fi
- tests of coding
- infrastructure mode
- wireless connection for telnet
- SDK
- algorithm
- report

Tools used

AIBO ERS-7

Mind 2

wireless access point

computer

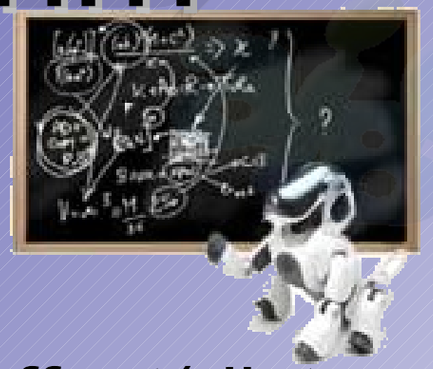
Tools used

R-Code

Tekkotsu

OPEN-R

Evolution of the algorithm



tests

- important result: effect(orientation) >> effect(distance)

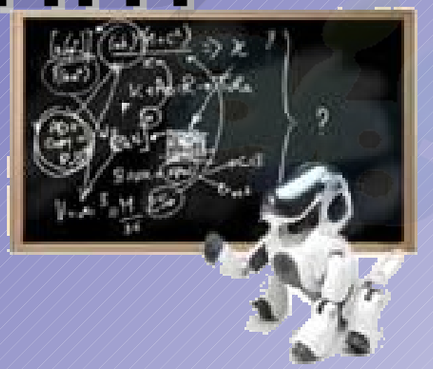
pentagon

first implementation of the rotation

second implementation of the rotation

finding something else

Evolution of the algorithm

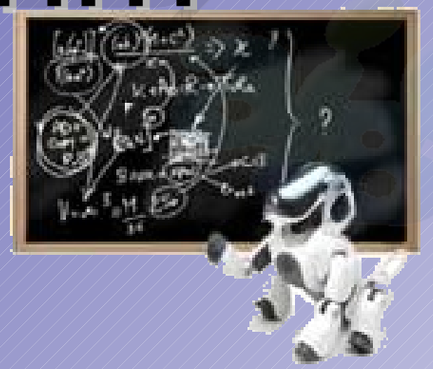


approximately constant angle

recording the last measurements

if in local minimum, than forward!

Evolution of the algorithm



other problems

- scattered measures
- low mean
  - solution 1
  - solution 2
- remaining problems
  - what if we stay in the problem state for too long?
  - reflection of the waves

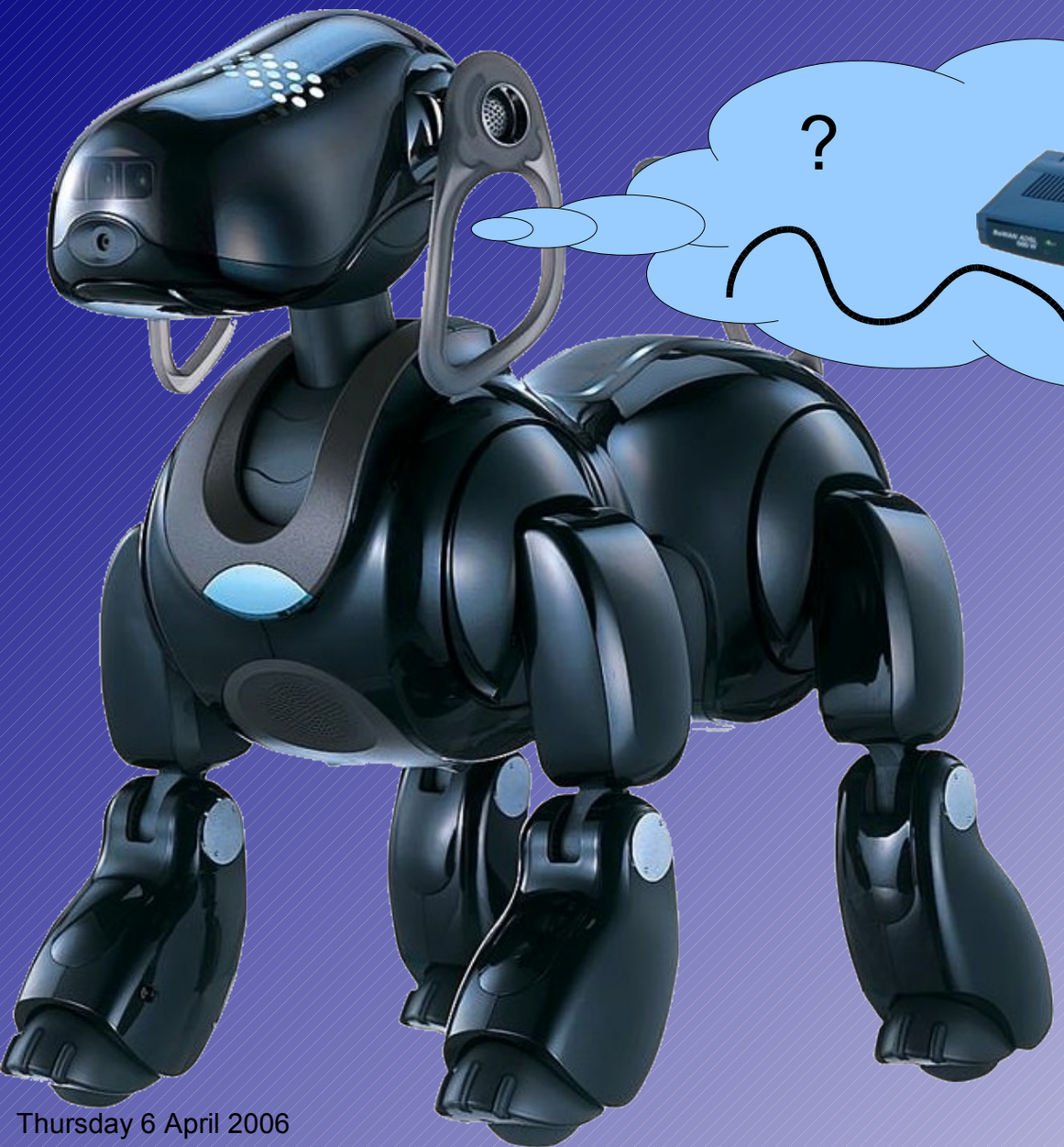
Result

not so bad in noisy environment + low power signal

better results with

- one single signal
- high power
- no reflection of the waves

Demonstration



- 100% alone
- values monitored on the PC

Gilles RÉANT

Problems encountered

connection to the CS wireless network

ad-hoc

URBI

learning from scratch

script

not fully implemented

numerous bugs

Next

what can be improved?

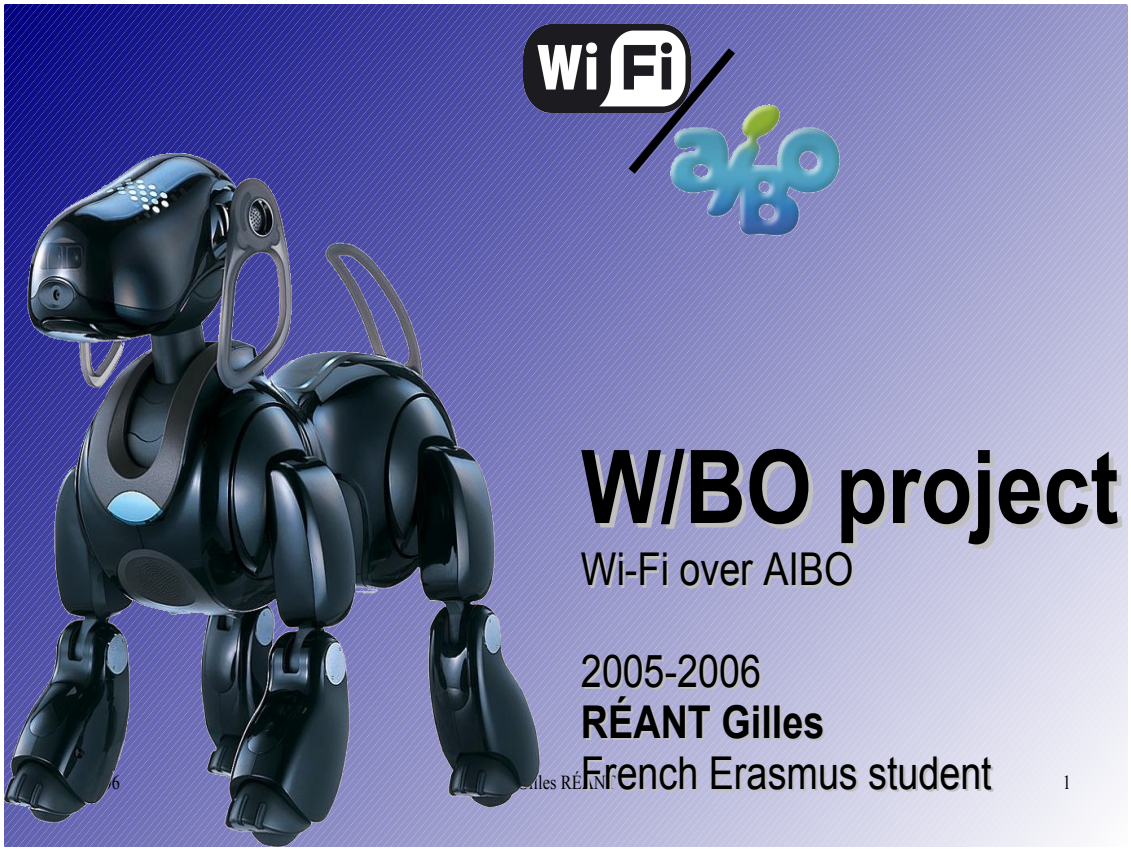
what will be done?

& after?

THANKS

Slides done with Open Office.org Impress 2.0.2

Gilles RÉANT



Good afternoon, thanks for coming

My name is Gilles RÉANT, I'm a Senior Sophister Erasmus student from France, & I'm going to talk to you about my final year project, name the W/BO project

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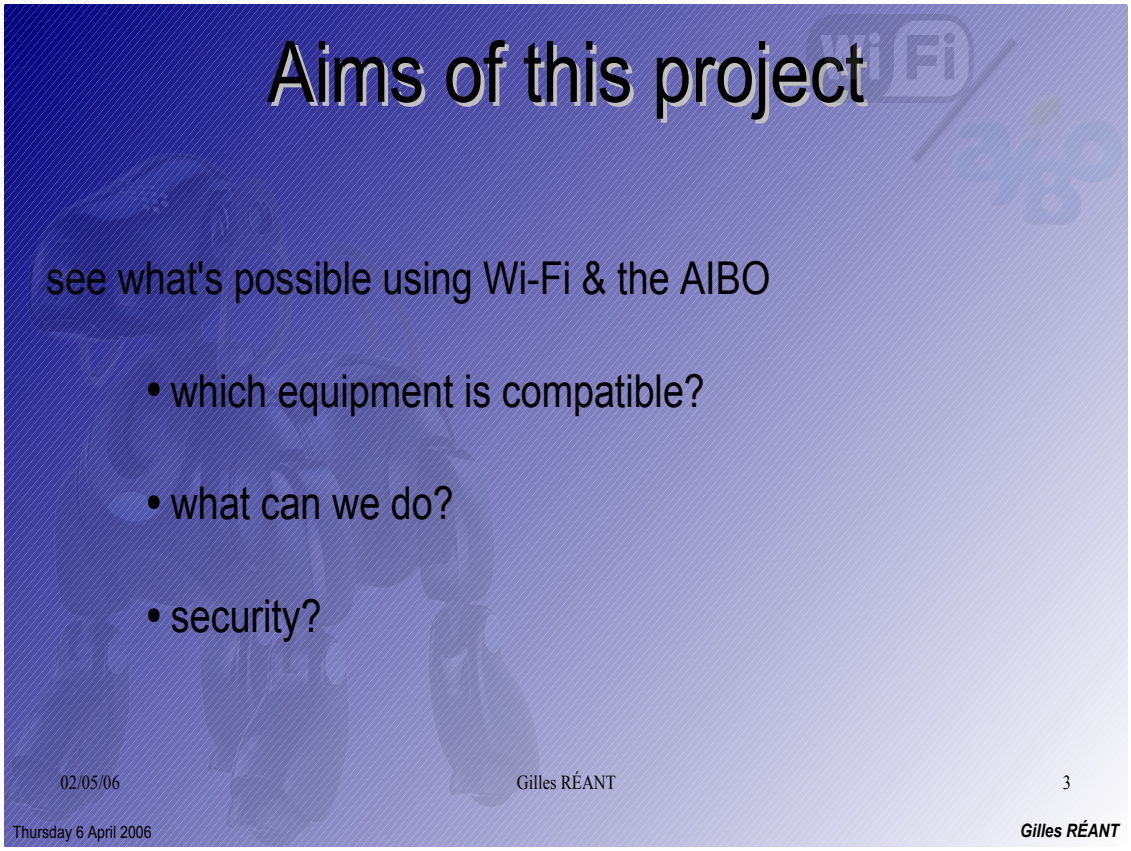


PC under Windows & Linux
Mac
Pocket PC
Laptop
Smartphones

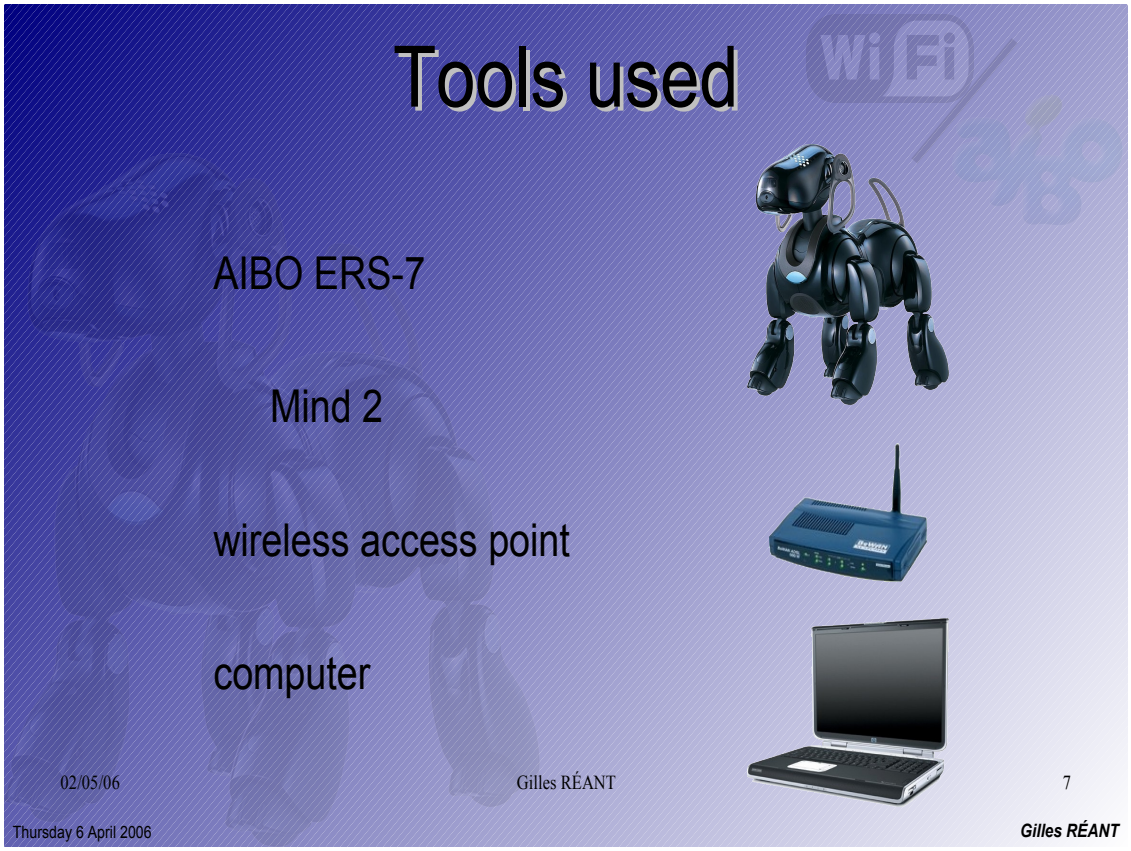
inner web server
telnet
full pack of functionalities on Windows:

- play CDs
- record videos
- create precoded movements
- see through the camera
- text to speech
- ...

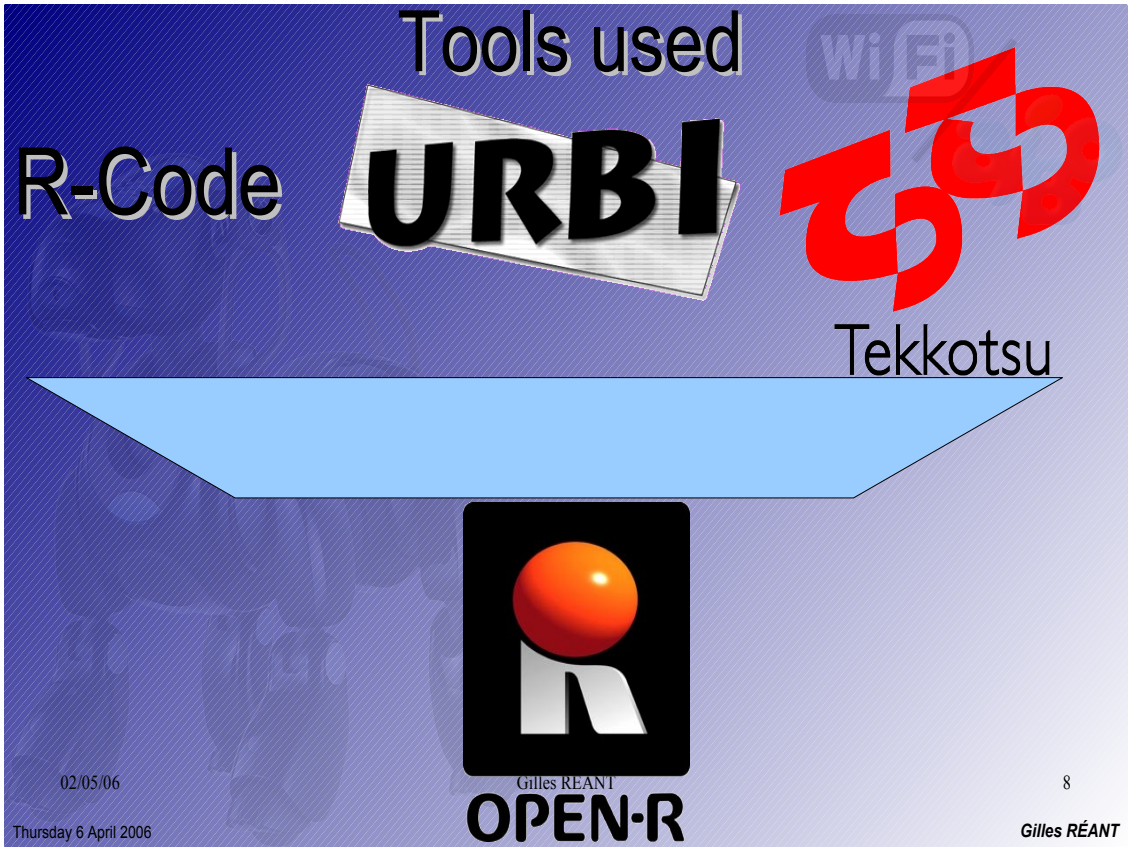
built-in wireless 802.11b card
based on an idea from my tutor
get, no set
1 single connexion defined in the memory card

in a word, preventing other people from loosing as much time as I lost

choose AIBO
theme
a few tests
ad-hoc doesn't work

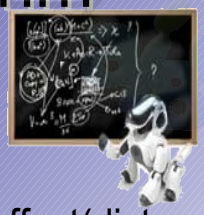


latest generation of AIBO
mind 2 just for starting test, can't use mind & coding your own software



finally chose URBI

Evolution of the algorithm



tests

- important result: effect(orientation) >> effect(distance)

pentagon

first implementation of the rotation

second implementation of the rotation

finding something else

Easy to show the live variation of the signal with URBI

first important result: the effect of the orientation of the AIBO is much more important than the distance to the access point

so, thought of a pentagon tesselation of the area

stop, making a measurement, rotating of 72°, 5 times, then decide which is the best direction to take

didn't give any good result, because the algorithm of rotation precoded in URBI gave a approximate rotation (the robot wasn't rotating around itself)

used another algorithm, which couldn't rotate of a precise enough angle (imprecision of more than 20%)

so I had to give up this idea, & find something else

Evolution of the algorithm

approximately constant angle

recording the last measurements

if in local minimum, than forward!

recording the 5 last measurements

Evolution of the algorithm

other problems

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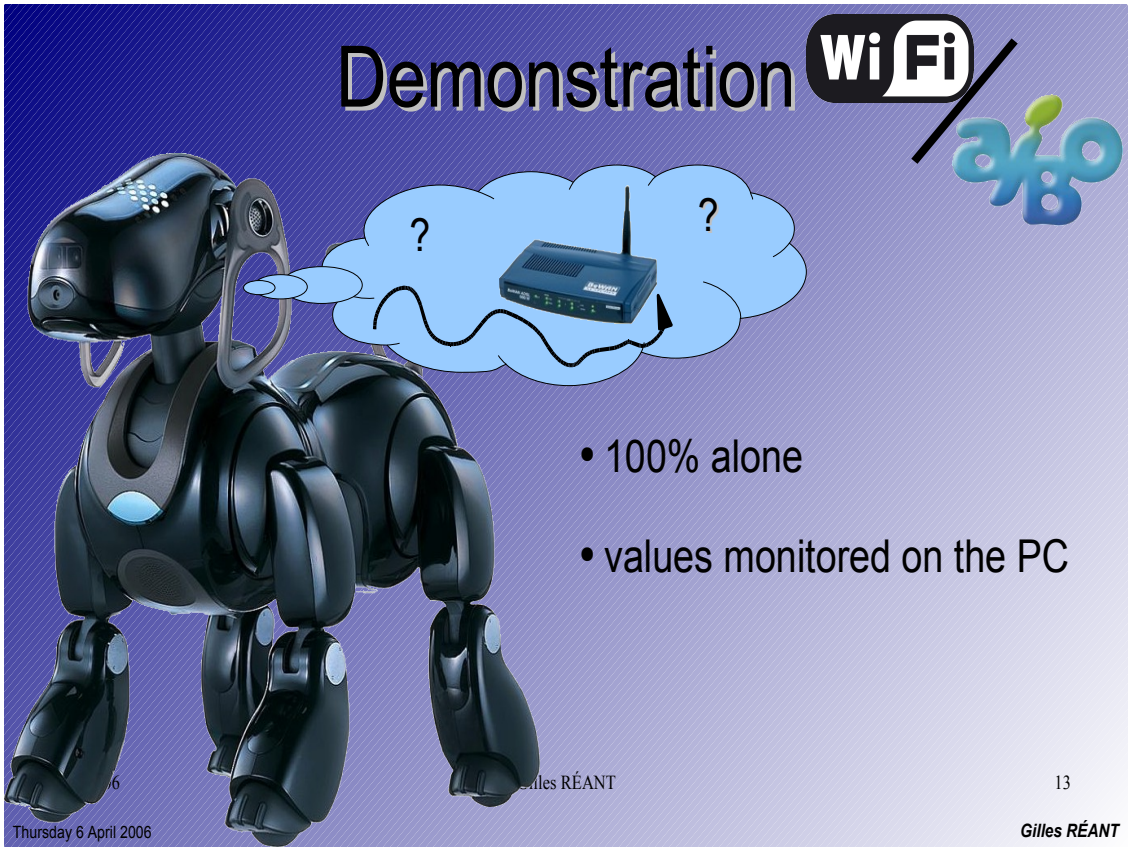

the access point is here
the AIBO will stop when the signal's power reaches 80% (Sony's unit)
first time I do this in this room, can't assure that it will work

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