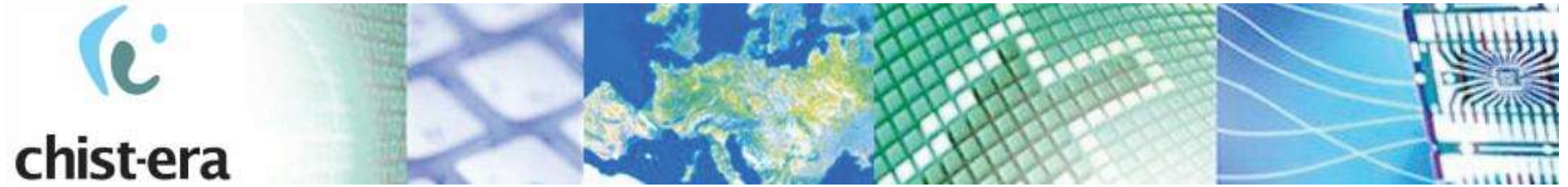


CHIST-ERA Projects Seminar
Day 2, Cross Topics
Topic Adaptive Machines in Complex Environments – AMCE

Ross D. King

Bern, April 29th, 2016

FUNDING OPPORTUNITIES from the FUTURE & EMERGING TECHNOLOGIES scheme

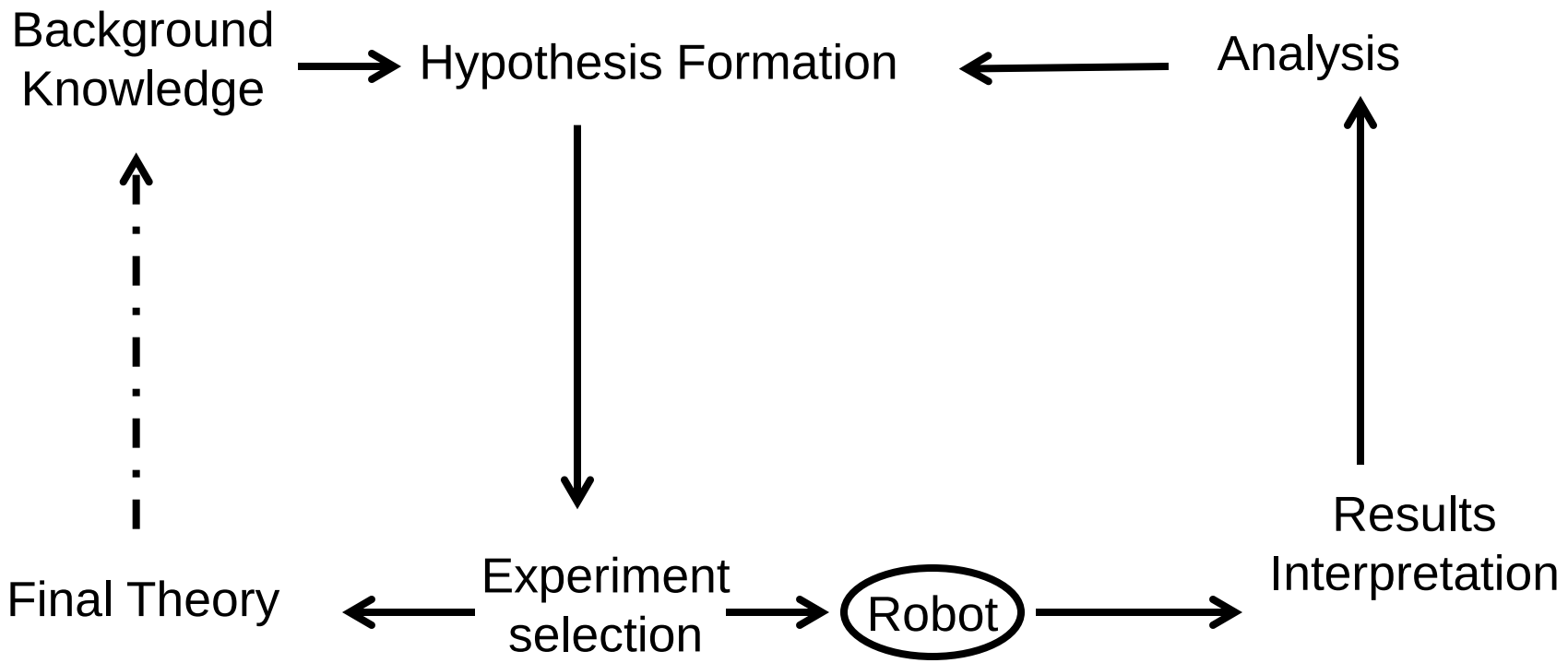
Introduction: Projects of the topic

Adaptive Machines in Complex Environments – AMCE

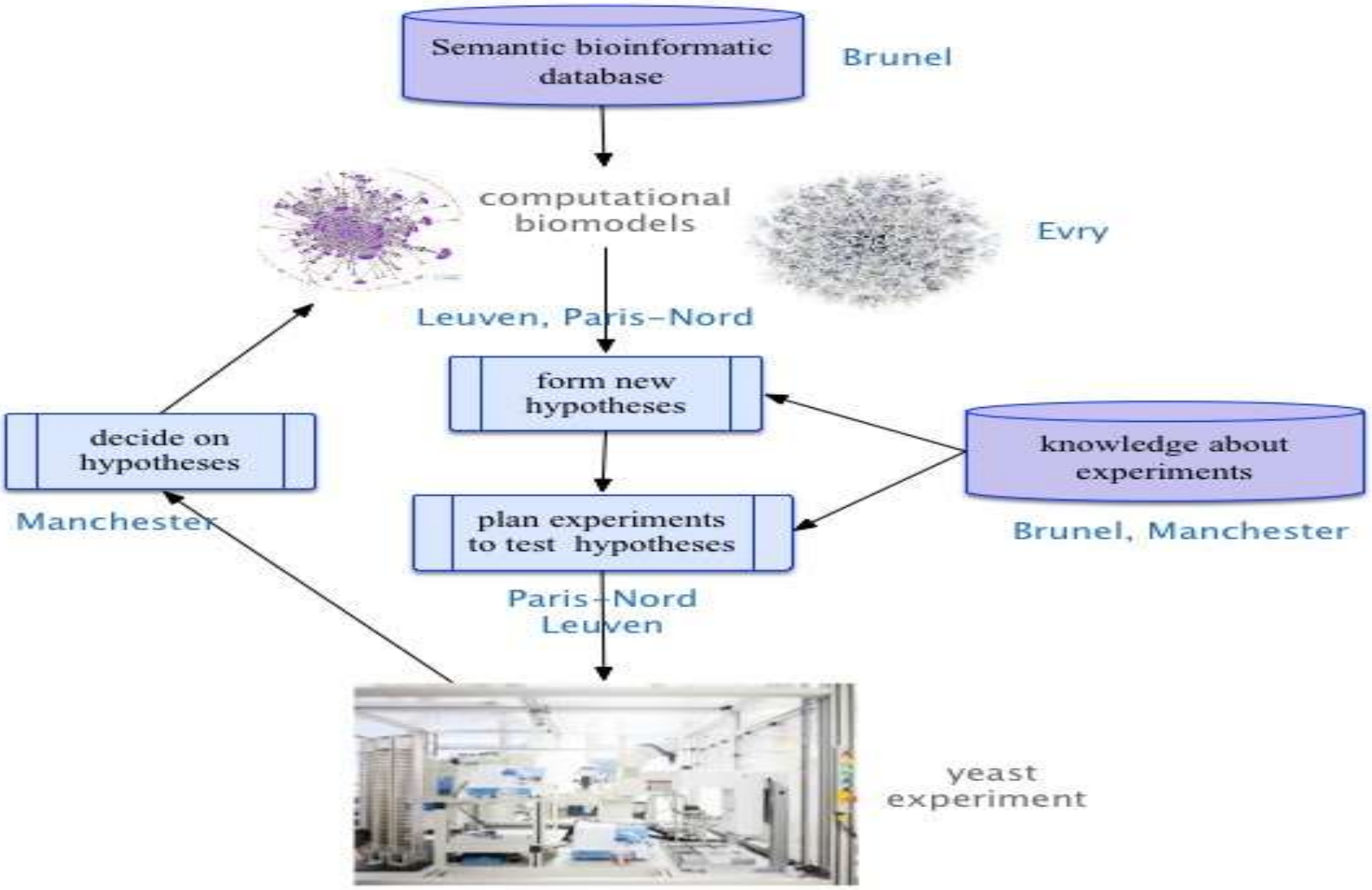
- **AdaLab: Adaptive Automated Scientific Laboratory**
  - http://www.chistera.eu/projects/adalab
- **COACHES: Cooperative Autonomous Robots in Complex and Humans Environments**
  - http://www.chistera.eu/projects/coaches

AdaLab – Robot Scientists

Computer systems capable of originating their own experiments, physically executing them, interpreting the results, and then repeating the cycle.

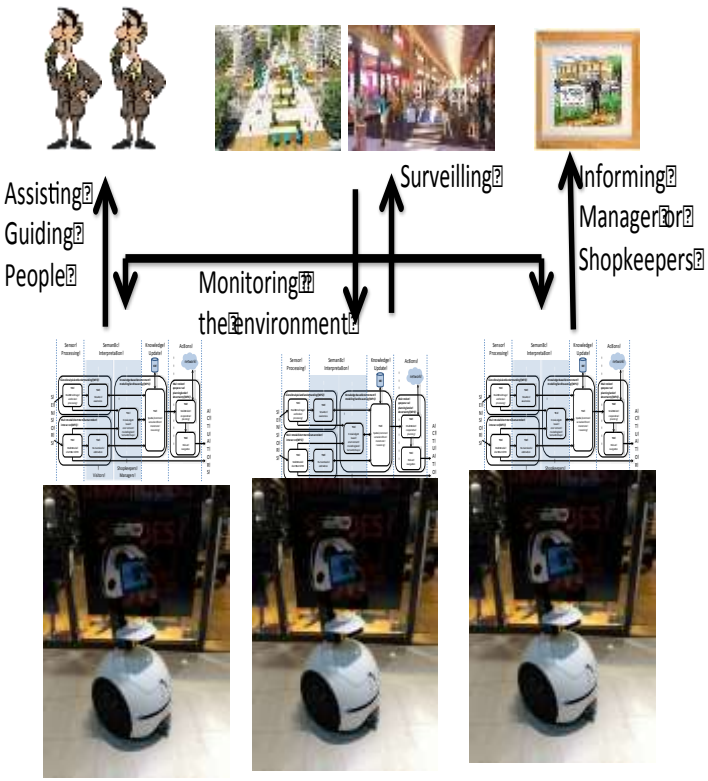


AdaLab - Structure



COACHES: Deploying robots in public area

- **Monitoring the environments**
- **Interacting with people**
- **Distributed planning for**
  - Accomplishing tasks : assistance, escort and support security units
- **Robust navigation in crowded environments**



SERVICES

SOFTWARE

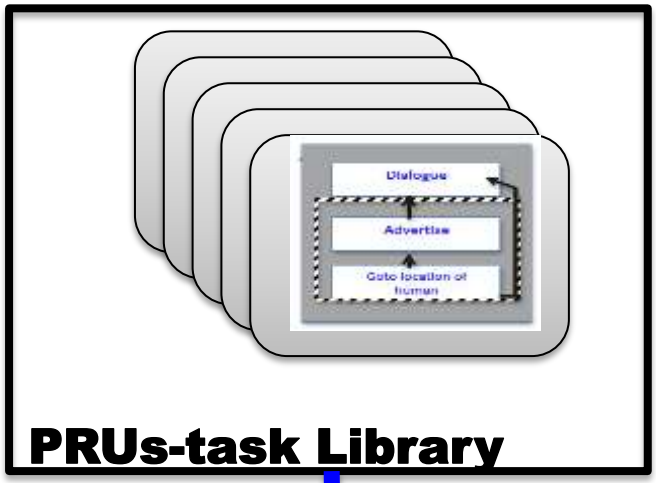
ROBOTS

COACHES: Deploying robots in public areas

WP2: **Vrije U.**
Perception

Extracted features

WP1: **Sabanci U.**
KB reasoning



List of goals

WP4: GREYC-CNRS
MDP-based planning

Selected PRU

Computed policy π

Petri-Net execution plan

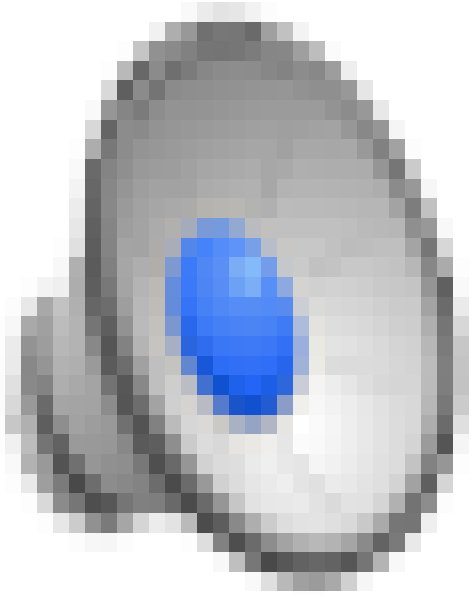
Navigation

Sapienza

Assistant

AdaLab - Major achievements and output

COACHES - Major achievements and output



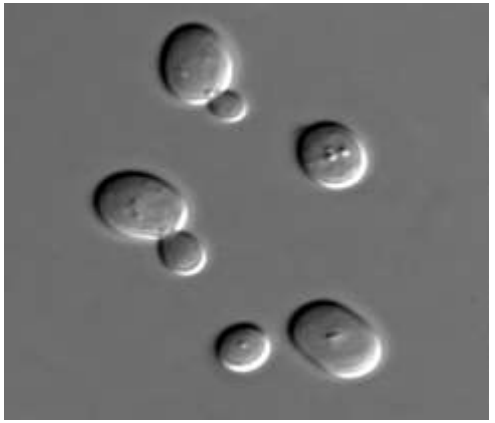
Project Overlap

Computer Science

Robot

Shoppers

Yeast



Project Overlap

- Probabilistic reasoning about an uncertain environment
- Knowledge representation
- Human computer interactions
- Planning – partial information, constraints

Project Differences

- **COACHES**
  - Human social behaviour / multiple robot agents

- **AdaLab**
  - scientific models / bioinformatics

Possible roadmap

- **Both projects well defined research plans.**
- **Investigating collaboration in the area of probabilistic inference: Bayesian networks.**
  - Visit of postdoc from Paris-Nord to Caen.
  - Joint workshop?

Challenges

- **Deep questions / fundamental AI – overlapping technologies.**
  - knowledge representation
  - probabilistic reasoning about an uncertain environment
  - human computer interactions
  - planning – partial information, constraints,

- **Humans in loop – how to get maximum synergy between best of humans and robots**

Role of the CHIST-ERA support

- **Advantages**
  - Collaborate – across Europe, but less onerous than H2020

- **Disadvantages**
  - Administrative burden compared to national call.
  - DARPA – in my experience better run than any European mechanism.

Questions

Questions ?