EU Projects @ AASS LS Lab

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Finding a Taxi in Seoul
The task: 6 persons want to go downtown after the conference!
1 September 2001 in Seoul

2001 – ICRA Conference, Seoul

This is not a taxi!

This is a taxi.
1 How to get an EU Project?

- I don't really know how to get an EU project!

- My EU project record (2004 – now)
  - FP6 STREP DustBot
  - FP7 STREP Diadem
  - FP7 IAPP DHRS-CIM
  - two unsuccessful proposals!

- I can only extrapolate my experiences to form a hypothesis about what may be important!

- The points are rather obvious
  - → at best, this is a useful presentation of apparent thoughts
1 The Mobile Phone Rule

- The Mobile Phone Rule for Partners
  - *You should have their mobile phone number and dare to call after midnight!*

- Good Personal Contacts!
Waiting 9 Months ... for the Examiner's Report
2 June 2003 in Coimbra

- 2003 – ICAR Conference, Coimbra
2 Importance of Presentations

- Importance of Presentations!
  - presenting our work
  - presenting ourselves
2 Importance of Presentations

- Importance of Presentations!
  - presenting our work
  - presenting ourselves

- Being Known as an Expert in your Domain
  - following a long-term vision
## 2 Importance of Presentations

- Importance of Presentations!
  - presenting our work
  - presenting ourselves

- Being Known as an Expert in your Domain
  - following a long-term vision
2 Importance of Presentations

- Importance of Presentations!
  - presenting our work
  - presenting ourselves

- Being Known as an Ex...
  - following a long-term vision

- Stamina/Perseverance
The Proposal
3 The Proposal

The 5 Key Questions to Answer

Why bother?

- what problem are you trying to solve?
- what knowledge gap are you trying to fill?

from "How to Write a Competitive Proposal for FP7"
(Dr. Sean McCarthy)
3 The Proposal

The 5 Key Questions to Answer

- Why bother?
- Is it a European priority?
  - why is it important in the view of the funding agency?
  - does the proposal address the call?
3 The Proposal

- The 5 Key Questions to Answer
  - Why bother?
  - Is it a European priority?
  - Is the solution/knowledge already available?
    - comparison with state-of-the-art
3 The Proposal

The 5 Key Questions to Answer

- Why bother?
- Is it a European priority?
- Is the solution/knowledge already available?
- Why now?
  - what would happen if you didn't do it now?
  - why was this not done before?
3 The Proposal

The 5 Key Questions to Answer

- Why bother?
- Is it a European priority?
- Is the solution/knowledge already available?
- Why now?
- Why you?
  - are you the best people to do this work?
3 The Proposal

- The 5 Key Questions to Answer
  - Why bother?
  - Is it a European priority?
  - Is the solution/knowledge already available?
  - Why now?
  - Why you?

- The Best Way to Internalize these Rules
  - become an EU reviewer yourself!
3 The Proposal

- Personal Additions
  - the proposal should be focused and clear
  - it is the convincing scientific twist that counts
  - writing skills are very important
Prerequisites for the Project
4 Running the Project

- Prerequisites for Running a Project
  - must convince the project officer (and the reviewers)
  - scientific and administrative qualification
4 Running the Project

Excellent People are Needed!

- availability of researchers that can work in the project (if only temporary)
- capability to attract the best people
4 Running the Project

- Capability to Attract People?

Research at

The Learning Systems Lab

of AASS, Dept. of Technology, Örebro University

Our research focus is the study of autonomy and learning in robotic systems that interact with dynamic, real world environments containing humans.

Projects

| Robotic Map Learning: | Simultaneous Localization and Map Building (SLAM) |
| Mobile Robot Olfaction: | Mobile Robot Olfaction |
| Learning Control: | Hierarchical Learning of Robot Behaviours |
| Recognition Systems for Autonomous Robots: | Enabling Human-Robot Cooperation |

- Optical Radar for 3D Modelling by Underground Vehicles
- Semi-Autonomous Mapping (SAM) for an Outdoor Mobile Robot
- Topological Mapping using Omnidirectional Vision
- Learning Control of Robot Arms by Emulating Human Actions
- Reinforcement Learning for Vision-guided Mobile Robots
- Object Recognition by Autonomous Robots
- Place Recognition by Mobile Robots
- Sensory Analysis in the Future Food Factory
4 Running the Project

Capability to Attract People?

AASS Learning Systems Lab
The research focus of the Learning Systems lab is on the development of algorithms and robotic systems for real-world tasks. In order to achieve a high level of autonomy under different and varying environmental conditions, the approaches developed are characterized by learning and fusion of information from different sensor modalities. The long-term aim is to better understand perceptual, biological and physical processes through the help of robots, using them indirectly as a model or directly as a tool for experimentation. Current research addresses learning skills for mobile robots and manipulators that interact with dynamic, real-world environments inhabited by humans. We consider “traditional” environments as well as environments populated with networked and distributed intelligent artifacts. Four major directions can be identified:

- Robotic Map Learning, concerning learning of spatial representations by mobile robots, including recognition of places, objects and people; covering aspects of robotic map learning from indoor to outdoor, from static to dynamic environments, from 2D to 3D maps, from topological and geometric maps to hybrid and semantic maps.
- Safe Operation in Dynamic, Shared Environments, concerning motion planning and obstacle avoidance for mobile robots in semi-structured, dynamic outdoor environments, particularly for safe operation in semi-structured ambient environments such as pedestrian public areas (DustBot project) and for autonomous transportation applications (MALTA project);
- Mobile Robot Odorization, concerning airborne chemical sensing by mobile robots in natural environments, in particular pollution monitoring in semi-structured ambient environments (DustBot project) and gas source localization and Bayesian gas distribution modelling (OHRS-CIM project);
- Dexterous Manipulation and Motion Learning, concerning learning of skills for robotic manipulators via demonstration from a human teacher, in particular learning and development of autonomous grasping and manipulation skills for
Running the Project

- Capability to Attract People?
EU Projects at the AASS Learning Systems Lab – DustBot
5 DustBot

DustBot (FP6 STREP)

- Networked and Cooperating Robots for Urban Hygiene
- Duration: December 1, 2006 – November 30, 2009 (36m)
- Activities Codes: IST call 6 - FP6-2005-IST-6
- Project Cost: 2.822.600 €
- EC Contribution: 1.898.000 €
- AASS Learning Systems Lab: 270.000 €
- Coordinator: Scuola Superiore Sant'Anna (PSV, Pontedera)
- Partners: Italy, UK, Spain, Switzerland, Sweden (5 universities/research institutes, 4 companies)
5 DustBot

- DustBot People
  - Matteo Reggente
    (WP5 – Distributed Environmental Monitoring)
  - Todor Stoyanov
    (WP4 – Navigation)
  - Achim Lilienthal
  - ... further
    - Marco Trincavelli
    - Shafkat Kibria
5 DustBot

- DustClean
5 DustBot

- DustCart
  - design patented, mechanical structure: patent in preparation
What's Next?

DustCart

- pleasant aesthetic design is supposed to be very important for usability
- pupil is a webcam
- most expressive and communicative is the luminous corolla (around the "pupils")
5 DustBot

- Status

  - environmental sensors

Preconditioned sensors for
  - CO (0-100ppm)
  - NO₂ (0-200ppb)
  - O₃ (0-500ppb)
  - Accuracy 10%
  - ~ 200-300 €

Temperature and Humidity sensor
  - ~ 20 €

Solid State Sensors
  - Accuracy ~20%
  - < 100 €

PM2.5-10 analyzer
  - Accuracy 10%
  - ~ 3000-3500 €
5 DustBot

Demonstrations

- in Pontedera, Italy (tent. March 28, 2009)
- in Peccioli, Italy (tent. April 18, 2009)
- in Bilbao, Spain (June, 2009)
- in Örebro, Sweden (tent. July 25, 2009)
  - Köpmangatan (close to the castle)
5 DustBot

Demonstrations

- in Pontedera, Italy (tent. March 28, 2009)
- in Peccioli, Italy (tent. April 18, 2009)
- in Bilbao, Spain (June, 2009)
- in Örebro, Sweden (tent. July, 2009)

Further Demonstrations

- Osaka, Universal CityWalk, with Advanced Telecommunications Research Institute (ATR Kyoto) – January 2009
- Tomorrow City, Incheon (with ETRI and KIST) – August 2009
EU Projects at the AASS Learning Systems Lab – Diadem
Diadem (FP7 STREP)

- Distributed Information Acquisition and Decision-Making for Environmental Management
- Duration: September 1, 2008 – August 30, 2011 (36m)
- Activities Codes: EU FP7-ICT-2007-2
- Project Cost/ EC Contribution: 3.760.000 € / 2.520.000 €
- AASS Learning Systems Lab: 270.200 €
- Coordinator: D-CIS lab, Thales, The Netherlands
- Partners: Netherlands, Romania, Germany, Denmark, Belgium, Sweden (4 universities, 5 companies/agencies)
5 System Integration – Diadem

- Diadem (FP7 STREP)
5 Diadem

prime objective

- system to help making decisions to prevent chemical incidents or to mitigate their consequences by

  - establishing methods and tools that allow gaining a better understanding/overview of the distribution of gas that emanates as a result of a chemical incident,
  
  - providing easy access to available information (pre-processing sensor data and combining information from different sources)
  
  - connecting the people required to resolve a given situation and routing the appropriate information to them,
  
  - estimating consequences of alternative decisions and presenting them in form of a risk analysis to the decision-makers, and
  
  - automatic reasoning about the situation and suggesting actions
How do the SMEs get in?

DustBot SMEs
RT – RoboTech SRL

- academic spin-off company of Scuola Superiore Sant’Anna
- founded in 2004
- edutainment (educational and entertainment) robotics
- design and development of robotic systems
- designed and developed I-Droid01
  - a humanoid robot for edutainment
  - sold approx. 115,000 of these robots as a collection
6 DustBot SMEs

HWC – HW Communications Limited, UK

- company
- telemedicine and healthcare
- communication infrastructure in harsh environments
- probabilistic location
  - outdoor positioning from GSM base stations
  - indoor positioning from WLAN access points
How do the SMEs get in?
Diadem SMEs
6 Diadem "SMEs"

- THALES-NL – Thales Nederland, Decis Lab
  - a global "information systems company"
    - aerospace, defense and security
    - civilian applications
DCMR – DCMR Milieudienst Rijnmond

- regional environmental protection agency operating in Rijnmond (the Port of Rotterdam area)
- responsibilities are
  - licensing
  - incidents & complaints centre
  - monitoring noise / air quality
SAS – Space Applications Services NV

"solutions and products for aerospace markets as well as related industries"

main business includes

- manned and unmanned spacecraft
- air traffic management
- robotics

distributed command and control systems for space-/aircraft and robots

training, virtual reality and man-machine interfaces
6 Diadem SMEs

- PDC – Prolog Development Center A/S, Denmark
  - advanced programming tools and planning, decision support, monitoring and information systems
  - ARGOS decision support system
How do the SMEs fit in?
6 Role of SMEs

Typical Role of SMEs

- project management
- end user
  - defines requirements
  - keeps the research "grounded"
  - dissemination/exploitation
- research partner (rather the exception)
Summary
7 Summary

1. Importance of Personal Contacts
   - mobile phone rule
   - disclaimer regarding this presentation
7 Summary

1. Importance of Personal Contacts

2. Being Known as an Expert
   - importance of presentations
     - presenting our work, presenting ourselves
   - following a long-term vision
   - stamina/perseverance
7 Summary

1. Importance of Personal Contacts

2. Being Known as an Expert

3. Remarks on Proposal Writing
   - answering the 5 key questions
   - becoming a reviewer
   - "it's the science, stupid"
   - importance of writing skills
7 Summary

1. Importance of Personal Contacts
2. Being Known as an Expert
3. Remarks on Proposal Writing
4. Prerequisites for the Project
   - scientific and administrational qualification
   - challenge of finding the best heads
7 Summary

1. Importance of Personal Contacts
2. Being Known as an Expert
3. Remarks on Proposal Writing
4. Prerequisites for the Project
5. EU Projects @ AASS Learning Systems Lab
   - DustBot
   - Diadem
7 Summary

1. Importance of Personal Contacts
2. Being Known as an Expert
3. Remarks on Proposal Writing
4. Prerequisites for the Project
5. EU Projects @ AASS Learning ...
6. How do the SMEs get in?
   - examples
   - role of SMEs
   - connection typically established in advance
EU Projects @ AASS LS Lab

Thanks for your attention and mental participation!
Agenda

1. Personal Contact Network
2. Being Known as an Expert in a Field
3. The Proposal
4. Prerequisites for the Project
5. Our Projects
6. How do the SMEs get in?
7. Summary