Steps towards real applications of cognitive technology

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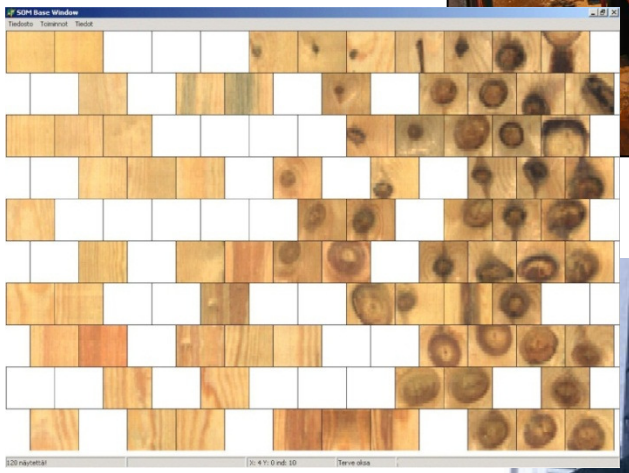
Outline

- Motivation: attract & secure continued funding
- Finding applications of cognitive technology
- 3 suggestions for points of connections
    1. End user scenarios and their requirements
    2. Benchmarking &best practice in perception
    3. Public outreach and the cognitive zoo

Applications of cognitive technology

- In a previous eucognition network
- Industrial prize awarded
- Wood processing system
- Utilising of self organising maps
- Business benefits
  - Higher value wood
  - Reliable operation
  - Ease of use



- Grew from EU project
- “Goldilocks” application
  - Not too easy, not too hard
- Worked closely with end users

Various press, vision system design

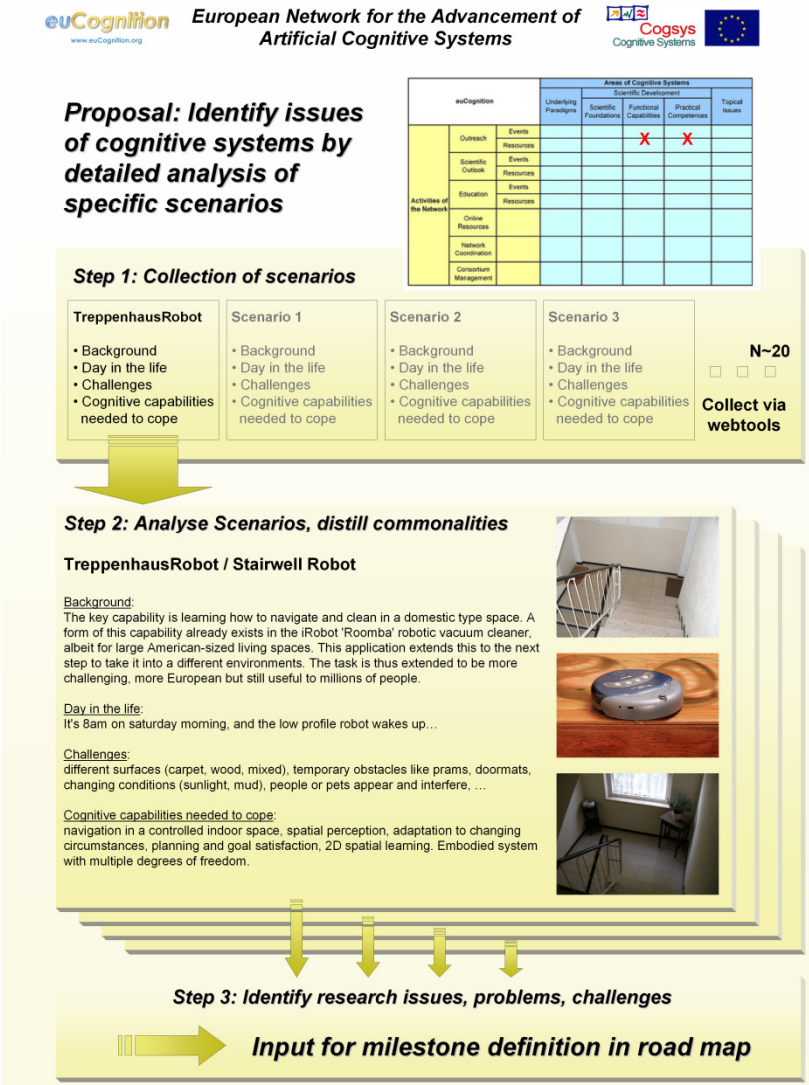
Too early or too late ?

Gartner 2011

1. Scenarios and their requirements

- Interact with end users
  - and stakeholders
- Collect use cases
  - defined scenarios
- Determine requirements
  - and how to test to them
- Match to capabilities
  - Not too easy, not too hard

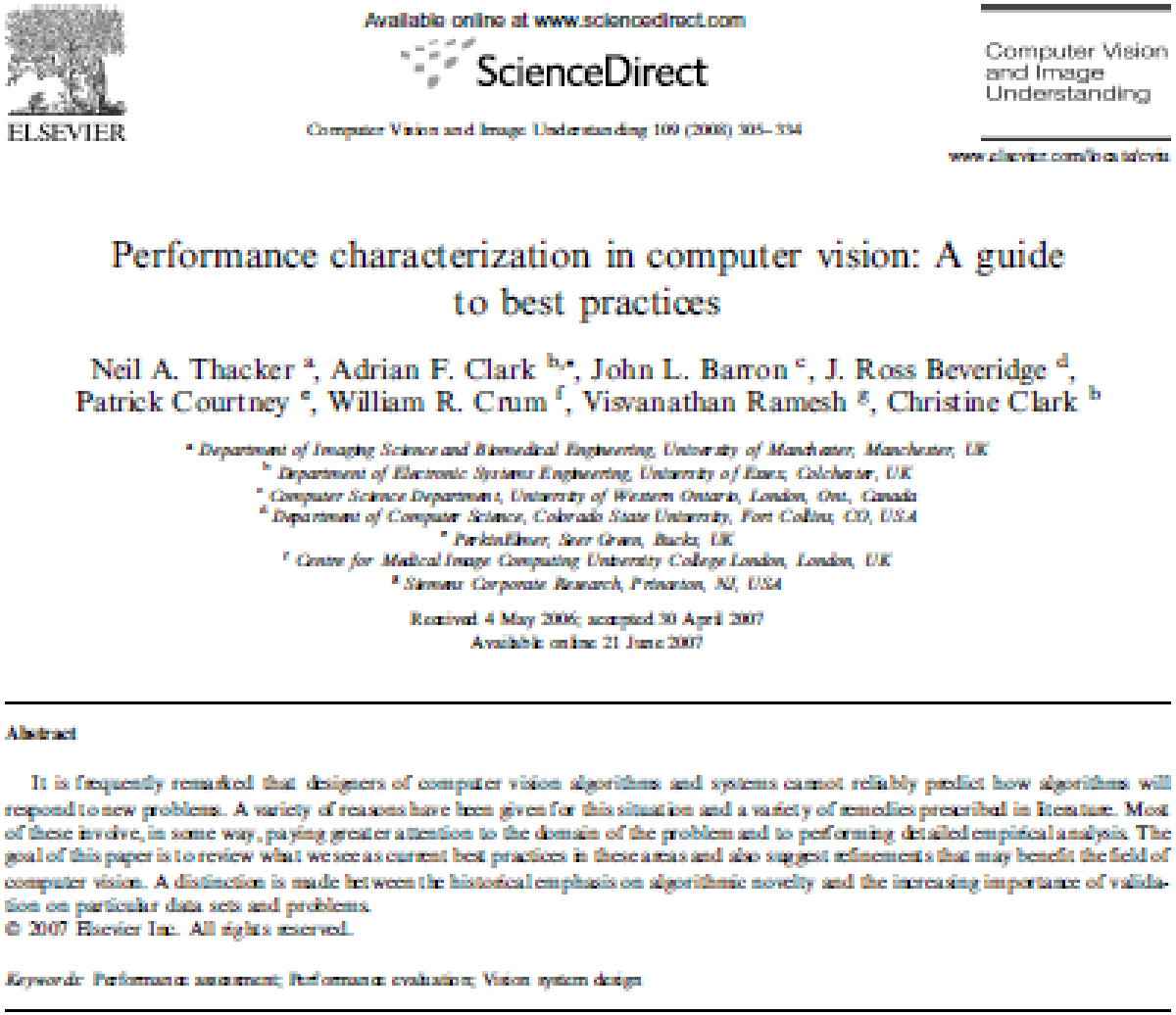
- As small scale experiments
  - such as in ECHORD



Treppenhaus/stairwell robot

2. “benchmarking” & best practice in perception

- Trust in the technology
  select + tune
- Tools and methods available
  – and used
- Face localisation is ubiquitous



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Performance characterization in computer vision: A guide to best practices

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Abstract

It is frequently remarked that designers of computer vision algorithms and systems cannot reliably predict how algorithms will respond to new problems. A variety of reasons have been given for this situation and a variety of remedies prescribed in literature. Most of these involve, in some way, paying greater attention to the domain of the problem and to performing detailed empirical analysis. The goal of this paper is to review what we see as current best practices in these areas and also suggest refinements that may benefit the field of computer vision. A distinction is made between the historical emphasis on algorithmic novelty and the increasing importance of validation on particular data sets and problems.

Keywords: Performance assessment; Performance evaluation; Vision system design

from EU project…also for biometrics, tracking, speech, machine learning…

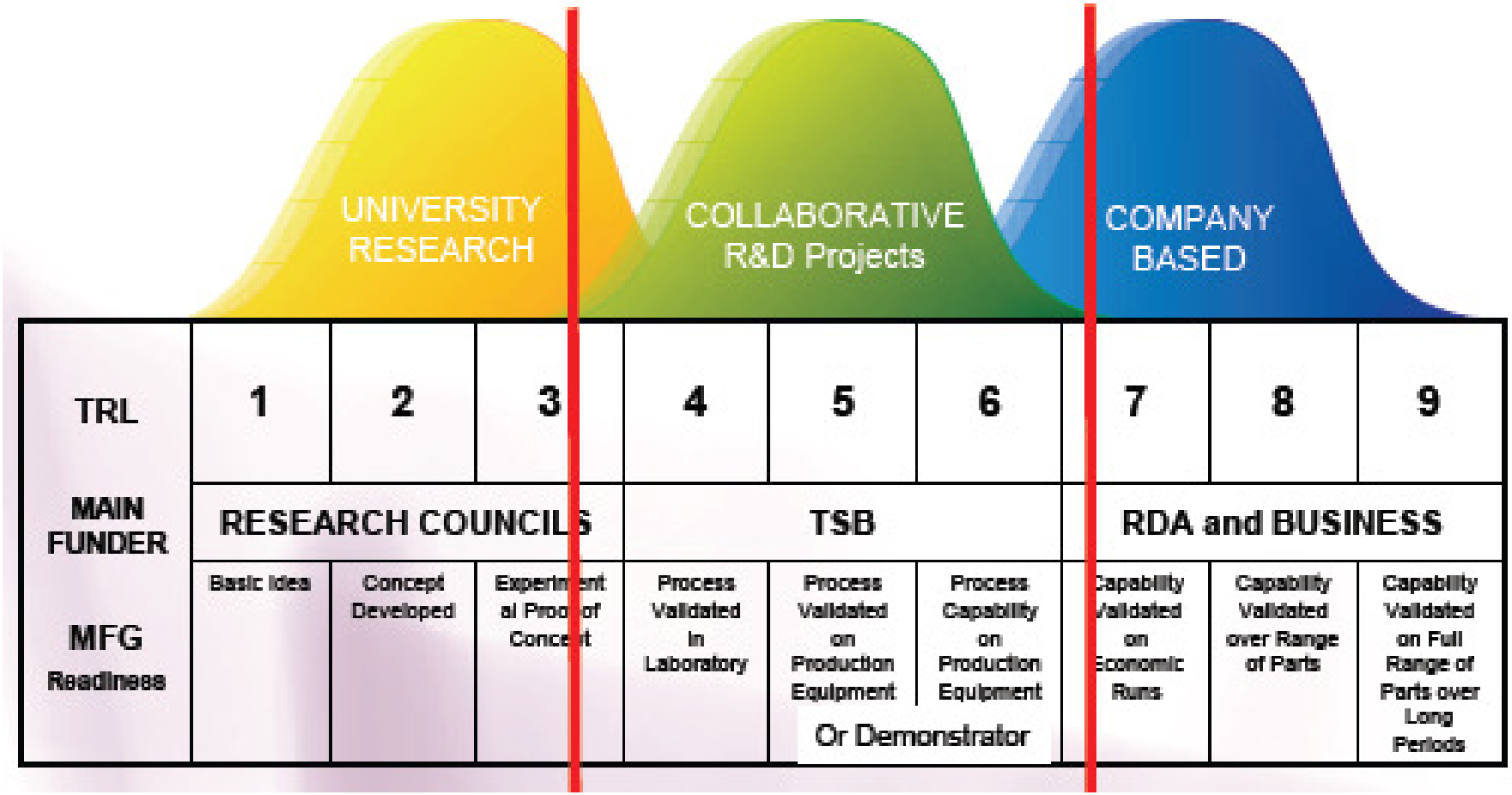
Roadmap for Artificial Cognitive Systems

- Problematic so far: preferred term “challenge”

- But see look at the Graphene community:
  - **Q: What do you think graphene will be used for first?**
  - A: “Two or three months ago, I was in South Korea, and I was shown a graphene roadmap, compiled by Samsung. On this roadmap were approximately 50 dots, corresponding to particular applications. One of the closest applications with a reasonable market value was a flexible touch screen. Samsung expects something within two to three years.” Andre Geim
- Note their semiconductor heritage

interviewed in Nature, October 2010

Technology readiness levels



NASA, UK government (technology strategy board)

3. Public outreach and the cognitive zoo

- developing appealing cognitive systems.
- allowing the cognition community to show-case work
- connect to other communities
- demonstrate key functionality in diverse environments
  - eg interaction, affordances, learning and play, robustness, etc

Robotville at London Science Museum nov 2011