

Participating in Autonomous Robot Competitions: Experiences from a Robot Soccer Team

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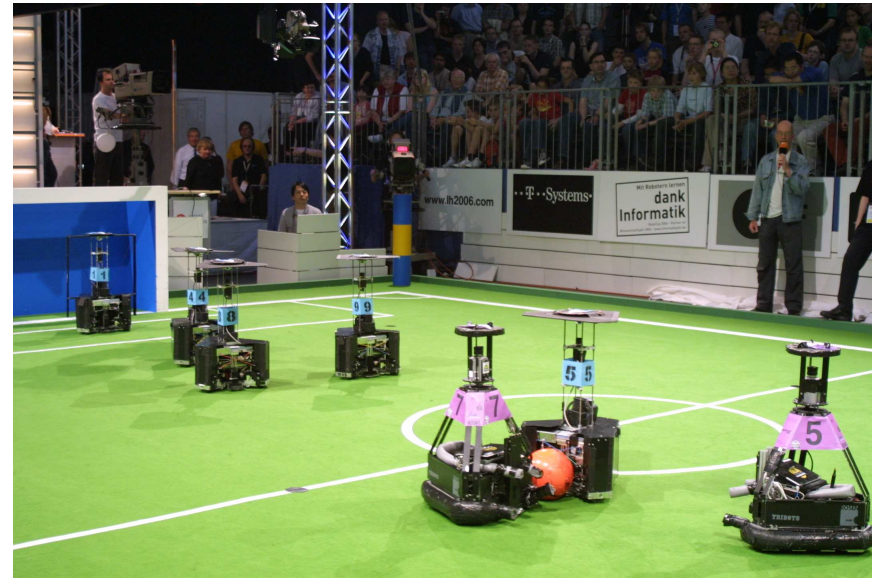
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RoboCup

- ▶ competition on autonomous mobile robots
- ▶ goal: soccer playing, win against the human soccer world champion in 2050
- ▶ different leagues, varying in robot size and abilities
- ▶ yearly world championships since 1997 + regional tournaments (GermanOpen, JapanOpen, ...)



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 - sensor analysis and machine vision
 - situation interpretation
 - behavior generation
 - multi-agent systems
 - learning systems
 - fault-tolerant systems
 - design principles for autonomous robots

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▶ challenges:

- real-time processing
- highly dynamic environment
- collaboration
- opponents with unknown strategy
- robustness and reliability

Team Brainstormers Tribots



- ▶ founded in 2002 as student project
- ▶ became research project
- ▶ successful participation in tournaments since 2003
- ▶ main research focus:
 - reinforcement learning
 - modeling and perception of the environment

Team Brainstormers Tribots: Focus of Development

Main focus of development:

- ▶ early years: create a reliable basis
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 - cooperative play
 - diversified strategy
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▶ successes



RoboCup and Scientific Work

Two ways of working:

“classical” research

▶ theory-based

RoboCup-like research

▶ application-oriented

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- ▶ both workflows have their merits
- ▶ scientific evaluation defined by classical research.

Personal Conclusions

If you want to participate:

- ▶ make it a middle-term project (≥ 3 years)
- ▶ schedule enough time for scientific dissemination
- ▶ define a central reserach area

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- ▶ becoming independent of scientific fad
- ▶ getting enough funding

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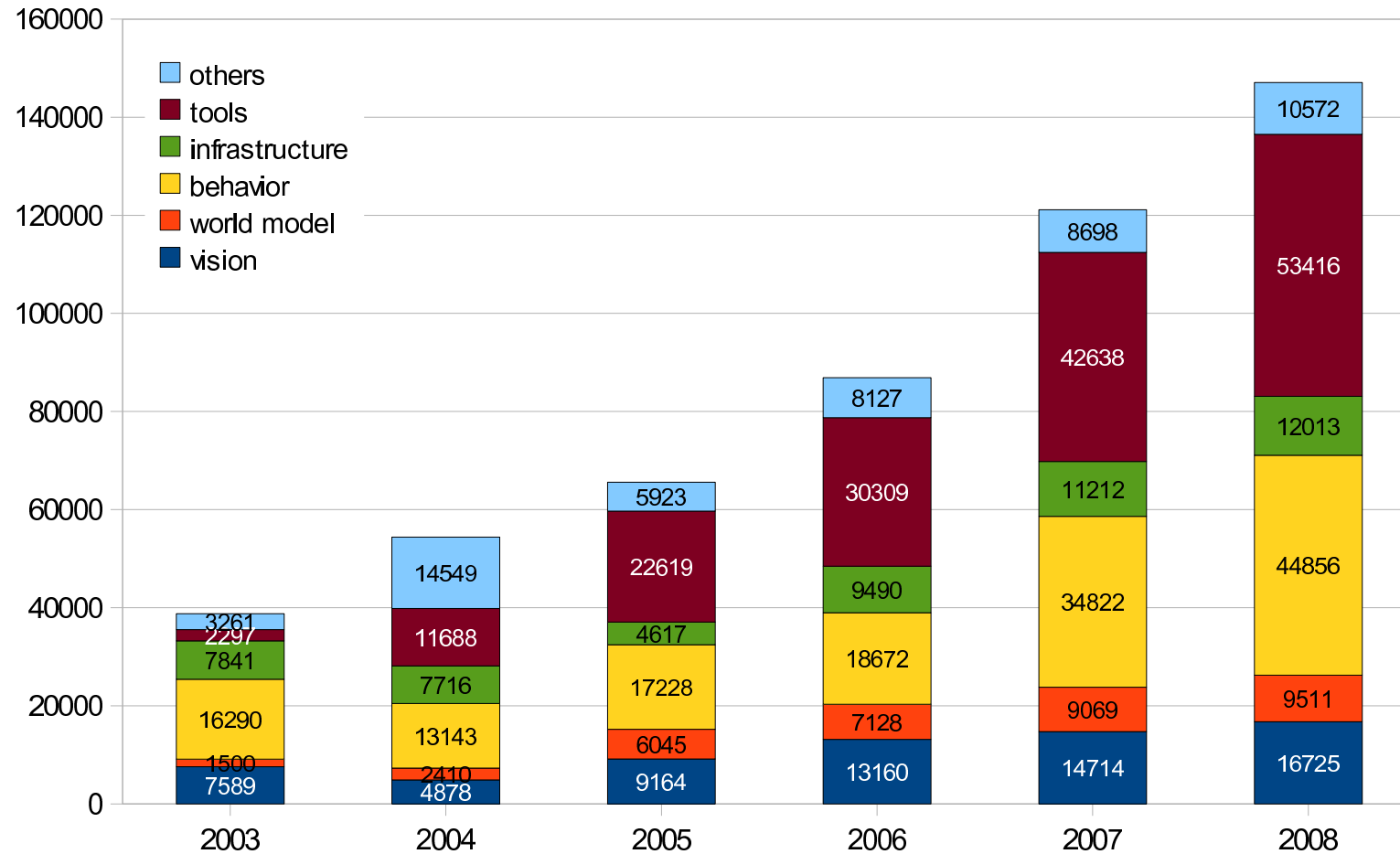
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Finally, would I do it again?

- ▶ YES!

Extra slides

Code



Publications

