Robot competition
Introduction meeting

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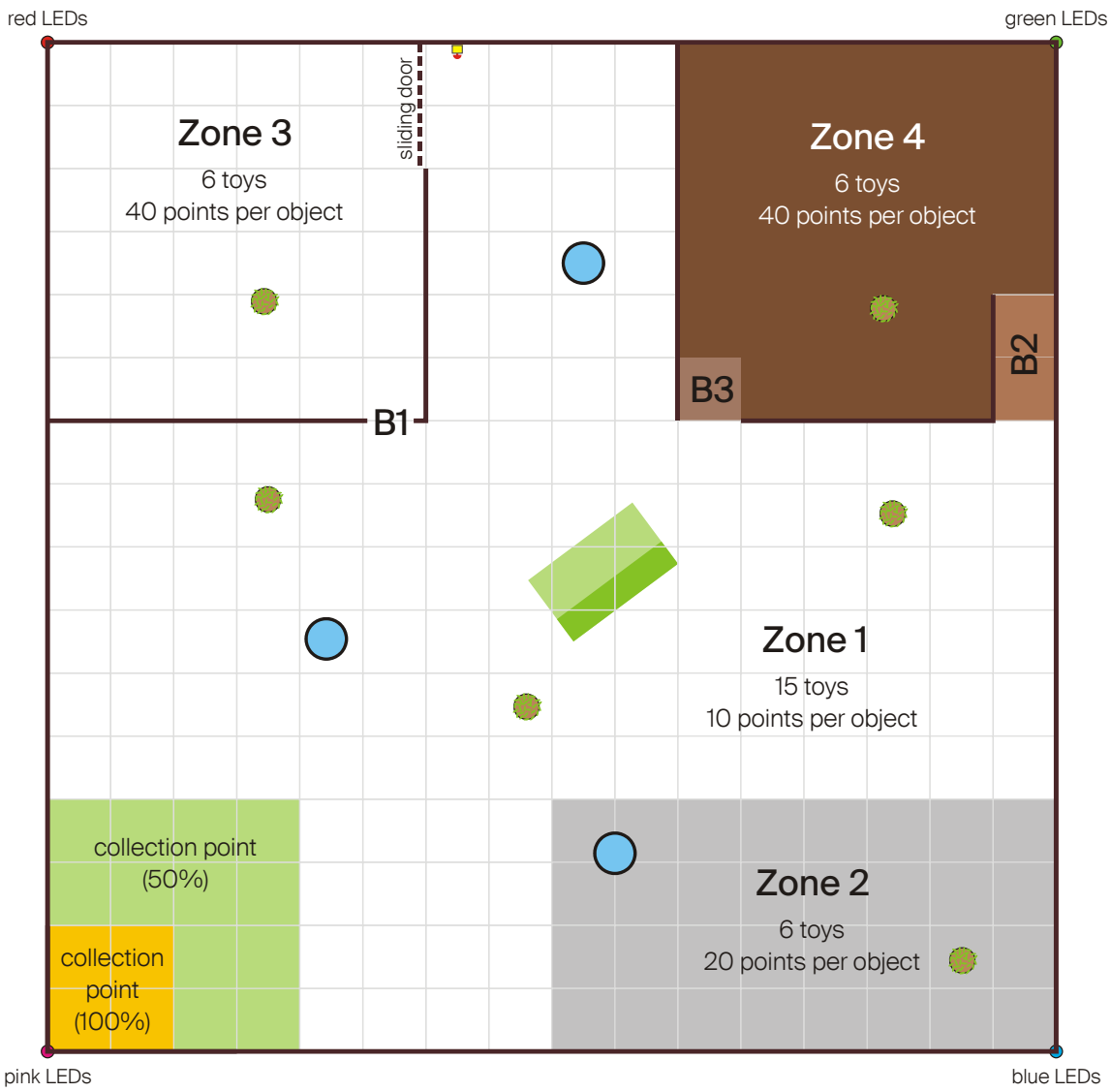
Goal of the competition

- Friendly competition: max. 6 teams of 3 students
- Earn a maximum of points by collecting toys (Duplo bricks) and depositing it at the collection point
- Arena with different terrain types: score depends on object positions
- Private competition (rehearsal, not evaluated)
- Public competition (robot features will be evaluated)

Educational goals of the competition

- Opportunity of creating a robot from A to Z
- Real-world challenges: real mechanics and electronics, system-wide integration, software & hardware debugging, choosing components and reading datasheets, supplier delays, unexpected costs, ...
- Functional and risk analysis
- Time, team, project & budget management

Arena example



Main rules

- Robots must be 100% autonomous:
  - Battery powered
  - No remote control
  - No remote computation
- Multi-robot solutions are allowed
  - Communication between robots is allowed (but not to offload computation)
  - Robots *must* have actuators with a competition-related goal
- Toys must remain intact
- Maximum size depends on arena constraints
- No flying solutions

Important dates

- Milestone 2: in around 3 weeks, format to be defined
- Design review (“milestone 3”): around **week 7**
- Report deadline: to be discussed with sections
- Final arena: **June 2nd to June 14th** (to be confirmed)
- Private competition: Thursday, **June 8th**, morning (TBC)
- Public competition: Wednesday, **June 14th**, afternoon (TBC)

Up-to-date calendar:
https://robot-competition.epfl.ch/calendar

Deliverables

- Report
- Videos

  A set of video files demonstrating all the capabilities of your robot.
  No fancy video effects or editing, simple cuts are ok.
- Archive with all source code, CAD files, etc.
- The robot participating to the competition
- All original packaging you received
- All virtual catalog parts (either in your robot or alone)

Grading

- Design review (milestone 3): 10%
- Achievements: 40%
- Report: 30%
- Video: 20% (scientific quality)

Achievements

Management (20%)

- Time management
- Budget management
- Team management
- Process management

Functionalities (40%)

- Localization & navigation
- Obstacle avoidance
- Being able to move toys
- Being able to drop toys at the collection point
- Robustness

Quality (40%)

- Mechanical design
  (drawings & design)
- Electronics design
- Software
- Integration
  (software & mechatronics)

https://robot-competition.epfl.ch/info

«List of achievements and grading»

Budget

- Real budget (750 CHF): buying parts
  - Coach must authorize the buying (except for small expenses)
  - Buy in local stores and keep receipts
  - Order from suppliers (*through us!*)

- Virtual budget (2000 CHF)
  - Components already in stock
  - Access to DLL-PROT facilities
  - Access to mechanical & PCB workshop

A few hints

- Keep it simple: a 4-DoF manipulator is *perhaps* overkill
- Don't *assume* things you didn't verify: *test* them!
- Discuss and ask questions if you have doubts
- Keep documentation of what you do
- Write drafts of report sections whenever possible
- Don't underestimate the time it takes for integration and software development: one week is *not* enough
- Rather be ready too early than too late...

Project registration

- Project title: “Interdisciplinary robot competition”
- Professor: Auke Jan Ijspeert
- The PDF is usually generated on IS-Academia, and will be (digitally) signed by the professor

https://robot-competition.epfl.ch/