



Lessons learned: A report from euRathlon 2015



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euRathlon: the Vision

- To advance **European Search and Rescue robotics**, by
 - Creating **outdoor robotics competitions** to challenge students, researchers and their robots
 - Running **workshops and summer schools** to train students in outdoor robotics
 - Developing the world's first competition that requires **air, land and sea robots working together with humans** to tackle a mock emergency

Preparatory events 1: euRathlon 2013

- 23-27 September 2013 Berchtesgaden, Germany
- 13 teams from 7 countries
- Challenges:
 - Reconnaissance and surveillance in urban structures
 - Mobile manipulation of hazardous materials
 - Search & rescue in smoke filled underground structure
 - Autonomous navigation

Manipulation of hazardous materials



Watching the Urban search challenge

Competition Director
Dr Frank Schneider
Preparing the robot



Autonomous Navigation

Preparatory events 2: 2013 workshop

Keynote: Mr Shinji Kawatsuma

- 24-26 September 2013 Berchtesgaden
- **Keynote speaker** Mr Shinji Kawatsuma, chief engineer for the robotics team at Fukushima Daiichi NPP
- 13 expert talks and 5 student posters
- Workshop Lead: Prof Juha Roning



Flying robot demonstration



Dr -Ing
Michael
Gustmann,
KHG



Preparatory events 3: Joint euRathlon/ARCAS workshop and summer school

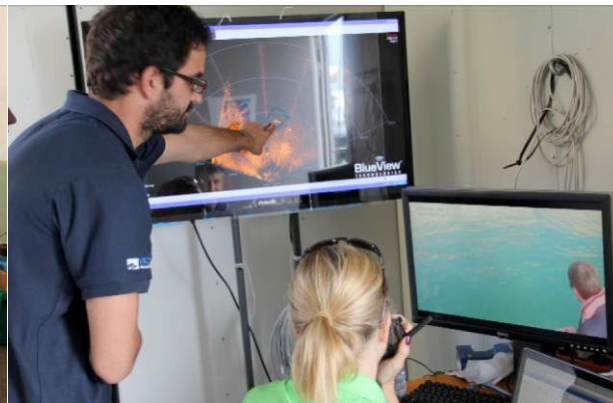
- Seville, Spain, 15–18 June 2014.
- 33 participants from 9 countries.
- Workshop
 - Invited speakers; papers/posters; live demos
- Summer school
 - Hands-on flying-land cooperation task
- Workshop leads: Prof Juha Roning and Dr Antidio Viguria



Preparatory events 4: The euRathlon 2014

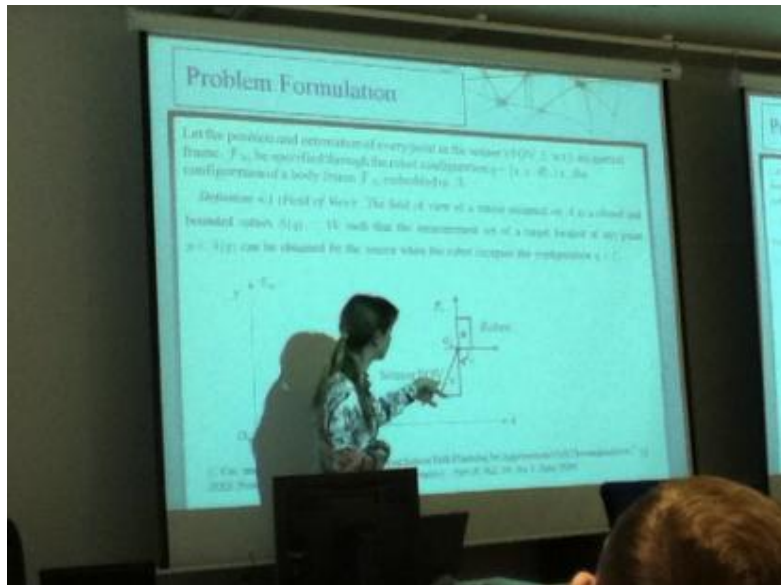
Sea Robotics Competition

- La Spezia, Italy, 28 Sept – 3 Oct 2014.
- 6 teams from 4 countries
- 5 scenarios
 - Long range autonomous underwater navigation
 - Leak localization and structure inspection
 - Interaction with underwater structures
 - Environmental survey of the accident area
 - Combined scenario
- Competition Director: Dr Gabriele Ferri



Preparatory events 5: joint 2015 euRathlon/SHERPA summer school and workshop

- Oulu, Finland, 1-5 June 2015
- 40 students from 11 countries
- Workshop leads: Prof Lorenzo Marconi, Univ of Bologna, and Prof Juha Roning



Keynote by
Prof Silvia
Ferrari



euRathlon 2015

17-25 September, Piombino, Italy

- 16 teams from 11 Countries, ~40 robots
- ~120 competitors + ~80 staff including judges, media & communications team, organising staff, stewards, technical and safety engineers (including divers and UAV safety pilots)
- ~2500 visitors and spectators
 - For competition and parallel public programme
- The programme:
 - 3 practice/safety check days + 8 days of competition

euRathlon 2015: the competition site

- A building to simulate the reactor chamber; nearby land area for land robots
- Ease of flying robots
- Protected harbor for marine robots; availability of open waters for long range navigation
- Places for tents and organization in the ENEL area (support by ENEL)

Protected
harbor area



Torre del Sale

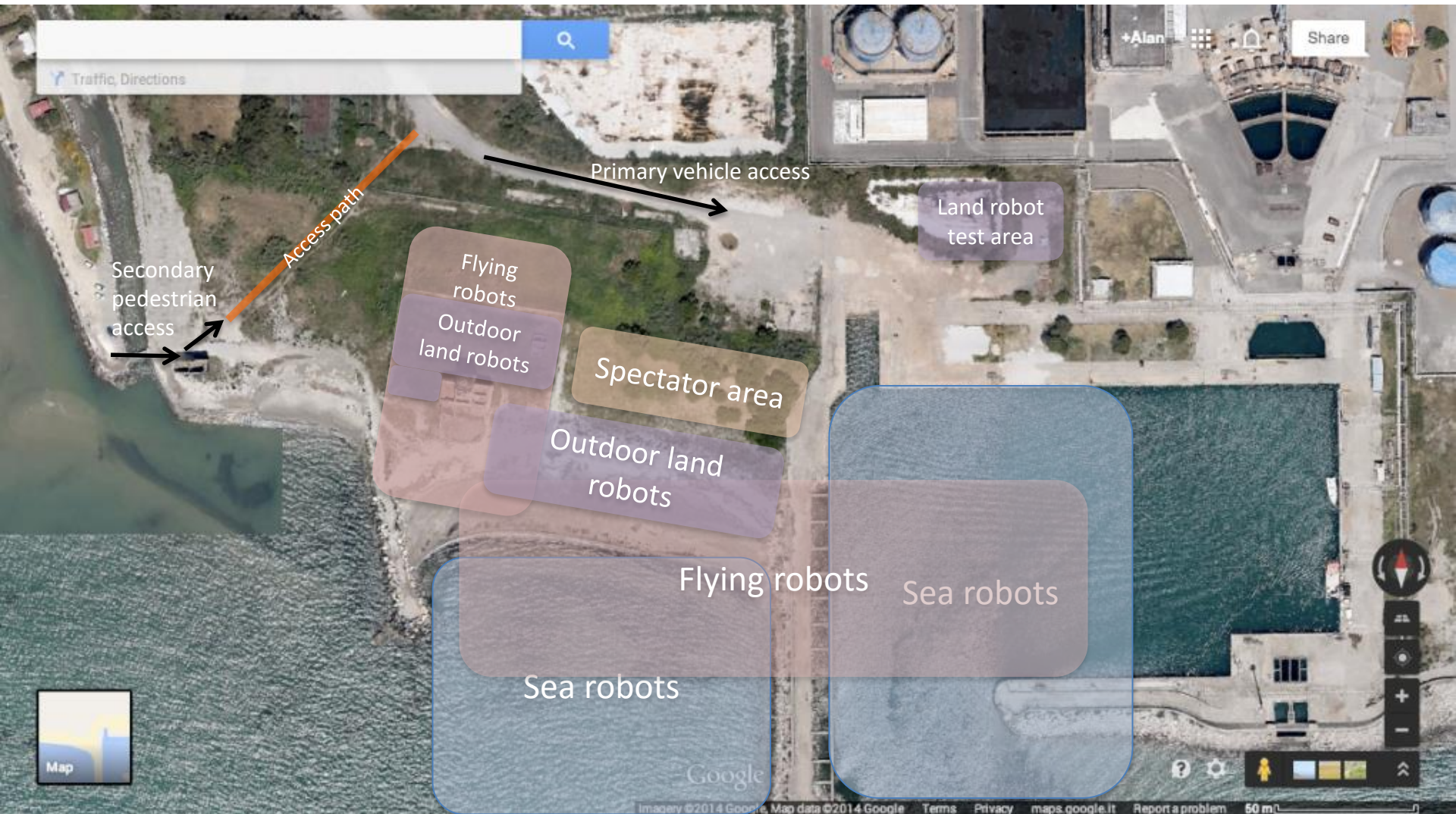


Area for
tents and
organization



Building
area

Competition areas for air, land and sea robots



euRathlon 2015: what went well 1

- The weather!
 - Only one half day cancelled because of high winds
- The site
 - Torre del Sale building + beach + lagoon was ideal
 - Excellent support from majors office & municipality
- Calibrating the difficulty of the Grand Challenge
 - We achieved a very good balance between difficulty and realism for the GC
 - All six multi-domain teams were able to compete, and some scored very well

euRathlon 2015: what went well 2

- Team Matching

- This was a great success, as evidenced by the GC 1st prize winner comprising 3 teams (air, land and sea) who had not worked together until the competition itself

- The parallel public programme:

- DARPA DRC demonstrations from DRC-HUBO, KAIST (winners) and team WALK-MAN, IIT
- Public demonstration from the ROBO-ERA project (SSSA Biorobotics Institute)
- Two evenings of public lectures in Piombino

euRathlon 2015: what went less well

- **Very full schedule** for teams and judges
 - 8 days continuous competition: **62 events** (46 single-domain, 10 two-domain, 6 three-domain)
- **Calculation of scores** was complex and time-consuming
 - Teams were required to submit mapping data (KML) and evidence of OPIs found (2D or 3D images) within 1 hour of each event
 - Assessing this data and calculating scores typically required ~1 hour for each event

euRathlon 2015: Grand Challenge day 1



euRathlon 2015: Grand Challenge day 2

Grand Challenge

Day Two



Thank you!



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