ISIS group - present and future work

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Departamento de Tecnología Electrónica
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- Current funded projects

- Research activities
  - Human-robot interaction
  - Mobile robot navigation
  - Control architectures
  - Vision systems

- Future work

- **Current funded projects**
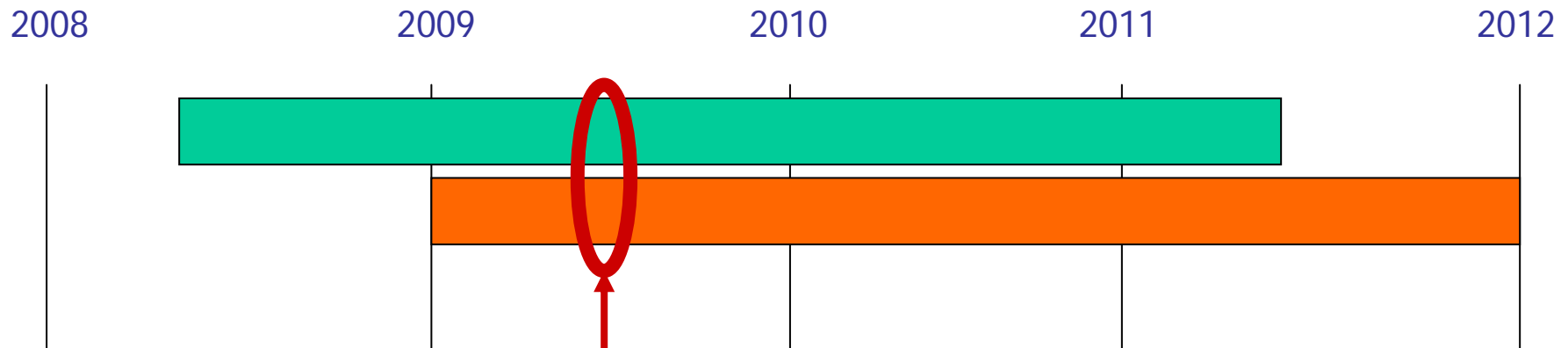
- Research activities

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- P07-TIC-03106 - Junta de Andalucía
ARQUITECTURA VISUAL BASADA EN PERCEPCIÓN ACTIVA

- TIN2008-06196 - Spanish MICINN
SISTEMA DE PERCEPCION VISUAL PARA INTERACCION HOMBRE-ROBOT Y NAVEGACION DE ROBOTS MOVILES

| 2008 | 2009 | 2010 | 2011 | 2012 |

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- **Research activities**
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  - **Vision systems**

- Future work

• The robot is able …
- to autonomously detect human faces and hands
- to track upper-body movements (torso, hands, head…)
- to recognize upper-body gestures
- to imitate previously observed upper-body movements

• We must include…
- auditory channels
- high-level modules to recognize human activities
- high-level modules which allows us to communicate with   the robot

• The robot is able …

  - to autonomously detect natural landmarks (laser or vision)

  - to achieve the simultaneous environment mapping and   self-localization using an EKF-based solution

  - to run a laser-based or vision-based odometry module (i.e.   scan-matching or visual odometry abilities)

  - to determine when it is entered into a new environment   place (map partitioning)

• We must perform…

  - intensive tests in real, indoor environments
  - the integration of all modules into a sw architecture

• The robot's architecture …
                    - hardware: we must finish the robot's
hardware
                    - software: we have an initial version of an
active perception   architecture (it includes
navigation modules)

 • We are currently implemented…
                    - a data-oriented sw architecture which
integrates all   modules (vision system, navigation,
interaction modules…)

• The vision system is able …

              - to determine regions of interest using a hierarchical   perception-based system

     • We must perform…

              - an attention mechanism which integrates bottom-up and top-down processing

              - intensive tests of visual landmark detection and human   detection
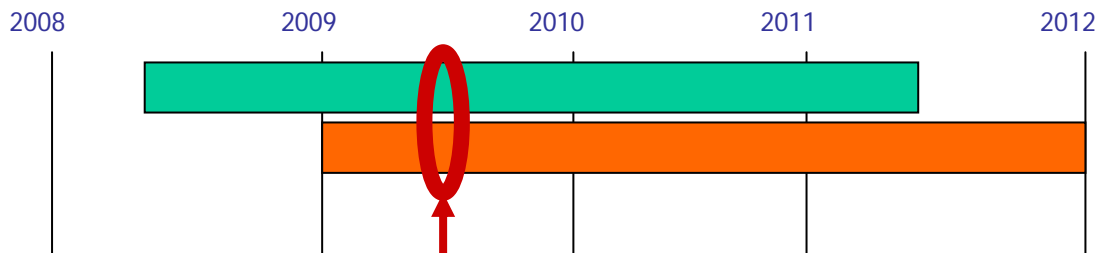
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- **Future work**

- Indoor environments - Intelligent Environments (Internet, external sensors…)

TIN-MICINN
Proy. Excel. (JA)
Integrated actions
EU projects?