

Learning a wall following behaviour in mobile robotics using stereo and mono vision

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Autores P. Quintía, J. E. Domenech, C. V. Regueiro, C. Gamallo, [R. Iglesias](#)

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Abstract This article describes the development of a wall following behaviour using a methodology for the learning of visual and reactive behaviours with reinforcement learning. With the use of artificial vision the environment is perceived in 3D, and it is possible to avoid obstacles that are invisible to other sensors that are more common in mobile robotics. Reinforcement learning reduces the need for intervention in behaviour design, and simplifies its adjustment to the environment, the robot and the task. The designed methodology is intended to be general; thus, in order to change the desired behaviour, only the reinforcement needs to be changed. We used the methodology for both stereo vision and mono vision applied to a wall following behaviour. For the definition of the reinforcement a laser sensor is used, and for the definition of the states a fixed 3x3 grid is used. Results are presented with a Pioneer 2 AT mobile robot. A Gazebo 3D simulator was used for the Learning and testing phase, we also perform a test with the real robot for the mono vision behaviour.

Palabras clave Reinforcement Learning, Mobile Robotics, Artificial Vision, Visual Reactive Behaviours

DESCARGAS

 Referencia BibTex

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Robots persoais