Open assistant position with PhD research on 'self-learning' robots, or master thesis

Are you interested in challenging research for letting robots learn, completely from scratch, to interact with their environment? As master thesis or as PhD?
Contact jan.lemeire@vub.be.

The ultimate goal is finding the first principles that enable a robot to learn to understand the world and its own capacities: the robot only knows that it can control motors and receives signals from its sensors. The successful example in this is the human baby who starts with an empty brain. This research is interesting for helping us to understand intelligence, learning, but also ourselves and our brain.

We are working on a novel approach to tackle this challenge. The robot will learn world models by exploring - just like a child that plays - the effect of its actions. We focus on qualitative models instead of the widely used black-box quantitative models. First, you learn qualitatively the changes that motors are causing (e.g. in which direction). Only later you learn how much input the motor requires. There is little research on qualitative models. But we discovered that our bottom-up approach links to language and top-down methods for reasoning and planning.

More info on our vision for self-learning robots:
http://parallel.vub.ac.be/learningrobots/vision.pdf

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