Blockchain for Robotic Event Recognition

Project proposal

Supervisor: Luís Alexandre

1 Goals

Robotics is currently one of the areas with greater growth potential inside Artificial Intelligence, given its many applications and the current state-of-the-art that allows for many tasks that were recently seen as possible to be completed by humans only, to be done by robots.

Blockchain is a recent technology that entails a distributed transparent ledger and is in fact a secure distributed immutable database accessible by all parties in a distributed network where transaction data can be recorded and easily audited [1].

In this project we want to do two main things: a) a state-of-the-art related to the recent applications of AI in the context of blockchain; b) the implementation of a blockchain approach that allows robots to register all the events that happen while they are active and contains smart contracts that make the robots act in certain ways when determined events are recognized. This can be as simple as saying hello when they recognize a given person or as complex as running an elaborate procedure when a combination of several events takes place.

In this context we wish to evaluate what would be the best approach for transaction validation: the proof-of-work [3], the proof-of-stake [5] or its variations [2].

The code will be done on the Robot Operating System (ROS) [4] in Python and will run on a Turtlebot 2 robot.
2 Work plan

The project has the following tasks:

**T1** Introduction to robotics, ROS and blockchain technology (4 weeks).

**T2** Implement code for creating a blockchain to record robotic events (4 weeks).

**T3** Implement smart contracts that process data on the blockchain as events take place and trigger robotic actions (4 weeks).

**T4** Write the project's report (3 weeks).

3 Technical and Academic Requirements

Be able to program using Python on Linux, use a source code repository and produce documentation (using doxygen or other similar tool).

It is desirable that the student has grades above 13 on the following courses: Estruturas de Dados, Probabilidades e Estatística, Inteligência Artificial.

4 Expected Results

- source code and documentation of all code developed
- project report

5 References


6 Contact

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