

# L3-C3 What type of learning?

For an exercise of this course, one of your colleague designed a artificial neural network (ANN) to implement local obstacle avoidance on Thymio. The learning algorithm used by your colleague to set the weights of the ANN consists in initializing randomly the weights of the network and moving around for a fixed amount of time in a setup full of obstacles and with a movement controlled by the ANN, updated at 10Hz.

1. If none of the sensors saturates and if the robots moves at least at 2cm/s, the conditions are considered "GOOD" and the network weights are reinforced with a very small learning rate.
2. If one sensor saturates, the mode of the learning algorithm turns to "BAD, OBSTACLE": the last 10 network inputs are taken and the weights are reinforced a bit toward turning on the spot clockwise at a speed of 1 rad/s.
3. If the robots moves too slowly ( $<2$  cm/s), the mode "BAD, SPEED" reinforces a bit the weights associating them with a speed of 3cm/s.

What type of learning is this, and what type of algorithms are associated?

- A: The two main modes "GOOD" and "BAD" reflect a classical reinforcement learning
- B: Having target speeds reflects a classical supervised learning, where we can compute an error and apply gradient descend.
- C: This is a mix of reinforcement learning ("GOOD" state) and supervised learning (both "BAD" states)
- D: None of the answer above are correct.