Project no. 640891

DREAM

Deferred Restructuring of Experience in Autonomous Machines

Horizon 2020 Framework Programme

FETPROACT-2-2014

Knowing, doing, being: cognition beyond problem solving

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D4.1

Thymio Module

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Project Consortium

Beneficiary no.	Beneficiary name	Short name
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2	UNIVERSIDADE DA CORUNA	UDC
3	QUEEN MARY UNIVERSITY OF LONDON	QML
4	ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET PROCESSUS INDUSTRIELS	ARMINES
5	STICHTING VU-VUMC	VU/VUmc

Dissemination Level

PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Dissemination Nature

R	Report	
P	Prototype	
D	Demonstration	
O	Other	X

Summary

The software package associated to this deliverable corresponds to the social learning module. This module is used to explore the possibilities and effects of using social learning in a collective of robots - i.e., the effect of exchanging information to learn jointly as opposed to learning individually.

The robots used in the collective learning are the wheeled Thymio II robots that are equipped with a more powerful logic board (Raspberry Pi) and a camera. Learning for an individual robot is implemented by evolving neural networks with a state-of-the-art evolutionary algorithm called NEAT. The NEAT algorithm was originally not designed for social learning**,** and we therefore created a simple extension of NEAT, allowing robots to share the weights and topology of the neural network. NEAT is designed as a general method that can be applied for any robotic task, and this module contains the following two experiments:

1. Simple task: obstacle avoidance
2. Complex task: foraging where the robots must collect pucks and transport them to a designated target area.