

Open Source Artificial Intelligence in a Biological/Ecological Context

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September 2, 2017

Abstract

Many machine learning techniques owe their inspiration to biological systems such as swarm intelligence, evolutionary algorithms, and neural networks to name only a few. Recent advances in open source software paired with decreasing prices of edge devices (i.e. drones, Raspberry Pis, Arduino Boards, and consumer robotics) are making it possible for researchers (as well as hobbyists) to create their own A.I. on an autonomous devices.

We present an open source AI engine which allows multiple drones to discern human faces, recall if they (or any in their swarm) have seen that face before, and execute some action to indicate whether or not they recognize the face. We hope this opens a bi-directional exchange of knowledge between researchers of A.I. and various biological sciences (especially animal cognition), allowing A.I. researchers to gain from decades of animal cognition research and develop practical systems in less time, and allowing animal cognition researchers to program quantitative models of animal cognition based on machine learning and compare results to those observed in various species. Further- the swarm of drones scales linearly to an arbitrary size, opening possibilities of interest to entomologists as well.