

Evripidis Gkanias

EDUCATION

SEPTEMBER 2018 – PRESENT

School of Informatics,

The University of Edinburgh, United Kingdom

Bio-mimetic Autonomous Systems (PhD)

Subject: Memory acquisition and retrieval in the insect brain

Supervisor: Prof. Webb Barbara

Abstract: Modelling the insect mushroom body (MB) as a sequential reinforcement learning mechanism. Limited by biological constraints of the insect brain, we come up with a computational model of the MB, which integrates multiple modalities, creates (long- and short-term) associative memories and is able to recall them whenever the animal needs them.

SEPTEMBER 2015 – AUGUST 2016

School of Informatics,

The University of Edinburgh, United Kingdom

Artificial Intelligence (MSc)

Grade: Distinction

Specialisation: Machine Learning.

Dissertation: "Data-driven adaptation of the evasion behaviour in fiddler crabs"

Supervisor: Prof. Webb Barbara

Courses: *Probabilistic Modelling and Reasoning, Machine Learning and Pattern Recognition, Reinforcement Learning, Neural Computation, Neural Information Processing.*

Award: UK/EU Master's Scholarship.

Activities:

Member of the Edinburgh University Sailing Club (EUSC).

SEPTEMBER 2008 – JULY 2013

School of Informatics,

Aristotle University of Thessaloniki, Greece

Computer Science (BSc)

Grade: First-class honours

Specialisation: Information Systems.

Thesis: "Deep Learning Algorithms for Multi-label Data".





Supervisor: Ass. Prof. Tsoumakas Grigorios

Activities: Member of the Photographic Club.

INTERESTS

RESEARCH machine/reinforcement learning, insect brain, memory, computational neuroscience, mathematical modelling, time-series, multimodal integration, computer vision

OTHER photography, sketching, music, sailing, travelling, reading

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WORK EXPERIENCE

MARCH 2017 – AUGUST 2018

The University of Sheffield, United Kingdom

Research Associate

I am responsible for investigating the information content of polarised light in relation to animal navigation - using machine learning and information theory - before using the outcomes to develop a technical specification / design for manufacture of a novel robot sensor. This is a joined work of the University of Edinburgh and the University of Sheffield.

SEPTEMBER 2016 – FEBRUARY 2017

The University of Edinburgh, United Kingdom

Research Associate

I focus on trying to imitate the learning mechanism of the larval *Drosophila*, which creates associations among odours and tastes. The goal is to create such a mechanism in neural level and put it on a robot platform. The robot will try to find the gustatory source following the gradients of the associated odour.

This task is part of the "minimal" project.

(blog.inf.ed.ac.uk/minimal/)

JUNE 2014 – AUGUST 2015

CERTH, Thessaloniki, Greece

Research Assistant

My main task was to implement a toolbox, using C# and the WPF subsystem, which could be used to analyse and compare human gestures, tracked using different capturing devices, i.e. Microsoft Kinect, Vicon, WIMUs. I also implemented an extension of it, which was compatible with Unity3D.

This task was part of the "RePlay" project.

(www.fp7-replay.eu)

TECHNICAL SKILLS

ADVANCED NumPy, Keras, OpenCV, Matlab, Python, C#, C/C++, Git, ~~TeX~~ Probabilistic Machine Learning, Un/Supervised Learning, Reinforcement Learning, Computer Vision

INTERMEDIATE Theano, TensorFlow, Simulink, weka, Linux, R, Java Information Theory

POSTERS

- 2019 **Robustness of a model of the insects' celestial compass in realistic conditions**
Gkanias, E., Scaria, A., Vladis, N. A., Risse, B., Mangan, M., & Webb, B. In International Conference on Invertebrate Vision, Bckaskog Slott, Sweden
- 2018 **Imitating the Drosophila Larval Learning Behaviour on a Robot**
Gkanias, E., Lagogiannis, K., & Webb, B. In Behavioral Neurogenetics of Drosophila Larva, Edinburgh, United Kingdom
- 2018 **Neural models of ant navigation in a realistic 3D world**
Pacella, D., Risse, B., Gkanias, E., Mangan, M., & Webb, B. In International Conference of Neuroethology, Brisbane, Australia.

CONTINUOUS TRAINING

- 2019 **International Conference on Invertebrate vision**
CONFERENCE
Lund University
- 2018 **The Maggot Meeting**
CONFERENCE
The University of Edinburgh
- 2018 **CapoCaccia Neuromorphic Workshop**
WORKSHOP
iniForum, University of Zurich
- 2017 **The Living Machines**
CONFERENCE
Stanford University, CA, USA
- 2016 **Creative Applications of Deep Learning using TensorFlow**
ON-LINE COURSE
Kadenze Academy, Parag K. Mital.
- 2014 **Getting and Cleaning Data**
ON-LINE COURSE
Coursera, Prof. Jeffrey Leek - John Hopkins University.
- 2013 **Control of Mobile Robots**
ON-LINE COURSE
Coursera, Prof. Magnus Egerstedt - Georgia Institute of Technology.

TEACHING SUPPORT

- 2019 **Introduct. Applied Machine Learning**
TUTOR, DEMONSTRATOR & MARKER
The University of Edinburgh
- 2013 **Heterogeneous Parallel Programming**
COMMUNITY TEACHING ASSISTANT
Coursera, Prof. Wen-mei W. Hwu - University of Illinois

PUBLICATIONS

- 2019 **From skylight input to behavioural output: a computational model of the insect polarised light compass**
Gkanias, E., Risse, B., Mangan, M., & Webb, B. PLoS Computational Biology
- 2017 **Predator Evasion by a Robocrab**
Stouraitis, T., Gkanias, E., Hemmi, J. M., & Webb, B. In Conference on Biomimetic and Biohybrid Systems (pp. 428-439). Springer, Cham.

ACADEMIC PROJECTS

- 2016 **Robocrab: Data-driven adaptation of the evasion behaviour in fiddler crabs (Master Thesis)**
We create a semi-supervised structure of neural network, inspired by the physiology of neurons in fiddler crabs, and train it to adapt the evasion behaviour of fiddler crabs on potential predators, solving a complicated visuomotor problem (developed in Python using the Theano/Tensorflow-based 'keras' library).
- 2016 **Modelling the skills of Go players**
We modelled the skills of a range of Go players, and we used an approximate inference method to predict the outcome of the Lee Sedol - AlphaGo game (developed in Matlab)
- 2013 **Deep Learning Algorithms for Multi-label Data (Bachelor Thesis)**
We extended a Java library implementing Restricted Boltzmann Machines and Deep Belief Networks and we used it to examine how these models perform in different multi-label task.

ACTIVITIES

- 2016 **Junction Hackathon**
Winning price of the Skype's "Artificial Intelligence Driven Bots" challenge.
- 2016 **Data Science Game**
24th place out of 143 teams.
- 2015 **Coastal Sailing Diploma**
2nd best performance in school.
- 2008 **Linear and freehand drawing**
4th best performance in school.

COMMUNICATION SKILLS

- GREEK Native speaker
- ENGLISH Oral: advanced – Written: advanced
- SPANISH Oral: basic – Written: basic