Kawai (George) Leung

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EXECUTIVE SUMMARY

- Theoretical Biophysicist with 5 years of machine learning experience.
- Analyzed time-series and image datasets utilizing various supervised and unsupervised machine learning methods such as Gaussian mixture model, convolutional neural network, generalized linear model, regularized regression models and dimensionality reduction methods that resulted in publications.
- Coordinated an interdisciplinary research team with physicists and biologists.
- 10 years of programming experience: MATLAB (Advanced), C, R, and Python (Intermediate), Fortran, Mathematica (Basic)

Area of expertise: Biophysics, Machine Learning, Statistical Mechanics, *C. elegans* Biology

RESEARCH EXPERIENCE

Emory University **2011 - Current**

Graduate Research Assistant**,** Theoretical Biophysics Group, Dr. Ilya Nemenman

- Developed the first statistical model in history to infer the level of pain from the behavior of *C. elegans*. The model analyzed over 10 gigabytes of video data using MATLAB and R.
- Experienced in using various Machine Learning methods in research and coursework.
- Experienced in statistical learning theory and information theory.
- Cooperated with researchers from other discipline such as Neuroscience and Animal Biology.
- Worked with Dr. Stefan Boettcher to implement combinatorial optimization (Extremal Optimization) on genetic fitness landscapes using C.

University of Toronto **Jan 2009 – Aug 2009**

Research Trainee, Terrence Donnelly CCBR, Dr. William S. Ryu

- Developed a customized computer vision system to capture and analyze the motion of *C.elegans* with MATLAB. The system is still being used today in Dr. Ryu's laboratory.
- Analyzed over 100000 pictures using a custom-made algorithm and published in the journal *Neuron*.

The Chinese University of Hong Kong

Undergraduate researcher **2010**

- Completed graduation project under the supervision of Dr. Long S. Chiu: Inferring global humidity data from satellite microwave imaging radar data. Involved unsupervised machine learning and regression models.

EDUCATION

Emory University, Ph.D. in Physics **Expected Aug 2016**

- Completed courses in Machine Learning, Network Science and Statistical Mechanics.
- GPA = 3.50

The Chinese University of Hong Kong, M.Sc. in Physics **2010 - 2011**

The Chinese University of Hong Kong, B.Sc. in Physics **2006 - 2010**

- Minor in Government and Public Administration
- Completed courses in Theoretical and Computational Physics
- GPA = 3.11

PUBLICATION

1. Kawano T, Po MD, Leung G, Bourhours M, Ryu WS, Zhen M. An Imbalancing Act: Gap Junctions Reduce the Backward Motor Circuit Activity to Bias *C. elegans* for Forward Locomotion. *Neuron*. 2011 Nov 17;72(4):572-86.
2. Leung K, Mohammadi A, Ryu WS, Nemenman I. Stereotypical escape behavior in *Caenorhabditis elegans* allows quantification of nociceptive stimuli levels. Submitted to *PLoS Comput. Biol.*

CONFERENCE PRESENTATION

American Physical Society March Meeting **March 2013**

- Title: Quantification of nociceptive escape response in *C. elegans*.

American Physical Society March Meeting **March 2016**

- Title: Stereotypical escape behavior in *Caenorhabditis elegans* allows quantification of nociceptive stimuli levels.

OTHER EXPERIENCE

Summer Teaching Apprenticeship, The Chinese University of Hong Kong **May – Aug 2008**

- Developed a physics curriculum for underperforming students in a local high school.
- Taught 50 students in English.

LANGUAGE

Cantonese Chinese (Native), Mandarin Chinese (Fluent), English (Fluent)