

Special Lectures

Date: June 1st, 2012, 10:30 -

Place: Tokyo Metropolitan University, Hino Campus 2-305

Participation Fee: Free

Language: English

1. 10:30 -11:30

Title: Fast Incremental Slow Feature Analysis

Speaker: Dr. Chu Kiong Loo (Professor, University of Malaya)

Abstract: The proposed Fast Incremental Slow Feature Analysis (F-IncSFA) which is considered as unsupervised learning, can be used for extracting spatio-temporal features. Here, we addressed a development in SFA algorithm as compare with latest one [17] by combining Candid Covariance-Free Incremental Principle components Analysis (CCIPCA) and Minor Components Analysis (MCA). The proposed F-IncSFA can adapts along with non-stationary environments and unlike the latest SFA, which has two times using CCIPCA, our method only using CCIPCA in its algorithm which makes the method simpler yet efficient.

2. 13:00 – 14:00

Title: Relative Scene Understanding

Speaker: Dr. Chee Seng Chan (Senior Lecturer, University of Malaya)

Abstract: Human-nameable visual “attributes” can benefit various recognition tasks. However, existing techniques restrict these properties to categorical labels (for example, a person is ‘smiling’ or not, a scene is ‘dry’ or not), and thus fail to capture more general semantic relationships. We propose to model relative attributes. Given training data stating how object/scene categories relate according to different attributes, we learn a ranking function per attribute. The learned ranking functions predict the relative strength of each property in novel images. We then build a generative model over the joint space of attribute ranking outputs, and propose a novel form of zero-shot learning in which the supervisor relates the unseen object category to previously seen objects via attributes (for example, ‘bears are furrer than giraffes’). We further show how the proposed relative attributes enable richer textual descriptions for new images, which in practice are more precise for human interpretation. We demonstrate the approach on datasets of faces and natural scenes, and show its clear advantages over traditional binary attribute prediction for these new tasks.

3. 14:10 – 15:10

Title: Design of interacting multi-stable nucleic acids for molecular information processing

Speaker: Dr. Effirul Ikhwan (Senior Lecturer, University of Malaya)

Abstract: Despite an exponential increase in computing power over the past decades, present information technology falls far short of expectations in areas such as cognitive systems and micro robotics. Organisms demonstrate that it is possible to implement information processing in a radically different way from what we have available in present technology, and that there are clear advantages from the perspective of power consumption, integration density, and real-time processing of ambiguous data. Accordingly, the question whether the current silicon substrate and associated computing paradigm is the most suitable approach to all types of computation has come to the fore. Macromolecular materials, so successfully employed by nature, possess uniquely promising properties as an alternate substrate for information processing. The two key features of macromolecules are their conformational dynamics and their self-assembly capabilities. The purposeful design of macromolecules capable of exploiting these features has proven to be a challenge, however, for some groups of molecules it is increasingly practicable. We here introduce an algorithm capable of designing groups self-assembling of nucleic acid molecules with multiple conformational states. Evaluation using natural and artificially designed nucleic acid molecules favours this algorithm significantly, as compared to the probabilistic approach. Furthermore, the thermodynamic properties of the generated candidates are within the same approximation as the customised trans-acting switching molecules reported in the laboratory.

4 . 15:20 – 16:20

Title: Intelligent Systems Research at Monash University

Speaker: Dr. Simon Egerton (Senior Lecturer, Monash University Sunway Campus, Malaysia)

Abstract: In the first part of my talk I will give an overview of Monash University and its role within Malaysia and outline the research being conducted with my school and the Intelligent Bio-Inspired Robotics Research group which I lead. The remainder of my talk will focus on one of our current research projects that examines a cognitive model for robot behavior and poses questions such as, can we model 'free-will', is this beneficial for a robot and what is 'free-will' anyway? The project models concepts from Fairbairn's seminal psychoanalytic studies on human personalities and derives a non-deterministic persona based control model which we are in the process of implementing. I will describe the model, outlining the quantum principles which underpin the models non-deterministic nature. The project is crowd sourcing contributions via an online virtual world scenario which I will talk through and technology permitting give a live demonstration.

Contact to

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