

DEPARTMENT OF COMPUTER SCIENCE

IDS 2017 Workshop on Applications of Deep Learning Neural Networks

Date: 20 Oct 2017

Venue : Hall 1

Timetable and run down

Time	Activity / Speaker	Title
09:30 – 11:00	Franco Scarseli	Application of Graph Neural Networks to practical problems
11:00 – 11:15	Coffee/ tea break	
11:15 – 12:45	Markus Hagenbuchner	Application of Recursive and Recurrent Neural Networks to practical problems
12:45 – 14:30	Lunch	
14:30 – 15:00	Pascal Zhang	Application of deep learning to pose estimation problem
15:00 – 15:15	Coffee/ tea break	
15:15 – 16:45	Markus Hagenbuchner/ Ah Chung Tsoi	Transfer learning applied to practical problems
16:45 – 17:00	Coffee/ tea break	
17:00 – 18:00	Ah Chung Tsoi	Applicability of deep learning techniques to practical problems
18:00	End	



Prof. Franco SCARSELLI
Professor
University of Siena
Application of Graph Neural Networks



Dr. M. HAGENBUCHNER
Associate Professor
University of Wollongong
Application of Recursive and Recurrent Neural Networks



Prof. A.C.TSOI
Adjunct Professor
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Applicability of deep learning techniques

ORGANIZER

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All are Welcome!



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ABSTRACT



Scarselli: Graph Neural Networks were introduced in 2010 as a generalization of previously recursive neural network architectures which were designed to model data with an underlying data structure, e.g., trees. The tree structures while being very useful in modelling natural languages, require significant amount of data to train. The GNN on the other hand do not have such a strong requirement on the data structure, and therefore require less number of data points. GNN has since been applied to many different situations. In this talk, the applications of GNN to various practical situations will be considered. Moreover, it will be shown how the GNN can be applied may be in combination with other neural network architectures, e.g., self-organizing map, multilayer perceptron, to give some of the best results on some of the benchmark datasets.



Hagenbuchner: Fully Recursive Perceptron Network (FRPN) is introduced as a novel architecture which could be used as an alternative to deep neural networks. This is a simple network, but more compact than the deep neural networks in that it requires less number of parameters to achieve similar results than an equivalent deep neural network. In practical implementations, this would be quite significant, as there would not need to be extensive implementation of the number of layers, and the varying number of hidden neurons in each hidden layer. This talk will concentrate on the possible applications of FRPN to various practical situations..



Pascal Zhang: MSc (Macau University of Science and Technology, MACAU) Research Assistant (Aug 2016 - Aug 2017), Dept. of Computer Science, Chu Hai College of Higher Education. This talk will report on the application of tracking idea to pose estimation in computer vision. The problem can be stated as follows: given a number of videos of animate objects, e.g., humans, is it possible to determine the pose, if the person is standing, sitting, lying, reclining, etc. from such videos. Mr Zhang will show how the concept of object tracking may be used as a way to track the movements of various parts of the person, and from there, to infer on the pose of the person.



Ah Chung Tsoi: In this talk, a common and popular preprocessing model, called convolutional neural networks will be re-examined in light of its highly restrictive fixed architectures. In other words, the way in which CNN works is to consider a window of convolution, and use this window to process all the pixels in an image in a fixed fashion. We would like to re-formulate this problem as a multilayer perceptron problem, involving a single hidden layer. We will show this re-formulation would allow different insights into the reason why CNN works, and why there may be a need of deep CNNs as proposed recently in the literature. This is then evaluated by working through common and popular benchmark datasets. This would provide a practical method for application of the deep CNN concept to practical situations.

Markus Hagenbuchner/Ah Chung Tsoi: In this talk, we will consider the issue of inadequate amount of training data in some domains, while there may be more abundant data in another domain. This situation occurs often in practical situations. It will be shown how the trained model from a domain with large number of training data can be adapted to work on the domain with inadequate number of training data. This is applied to a number of datasets to illustrate its capabilities.