

# IMI RESEARCH SEMINAR

**DATE:** 22 October 2015, Thursday

**TIME:** 11:00 am – 12:45 pm

**VENUE:** IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01,  
50 Nanyang Drive, Singapore 637553

\*Lunch will be served

**11.00am – 11.45am**

## Collocations and Anaphora Resolution in Machine Translation



### **Prof Eric WEHRLI – Visiting Professor, University of Geneva, Switzerland**

Collocation identification and anaphora resolution are widely recognized as major issues for natural language processing, and particularly for machine translation. An abundant literature has been dedicated to each of those issues, but to the best of our knowledge their intersection domain – collocations in which the base term has been pronominalized – has hardly been treated.

In this talk, I will present our contribution towards filling this gap, focusing on the translation from English to French of collocations of the type verb-direct object (*to break a record, to make an appointment, to make a case, to take a break*, etc.), with and without pronominalization of the complement.

#### **About Prof Eric WEHRLI**

- Studies in theoretical linguistics (PhD, McGill University, 1979) and computer science (MS, University of Neuchâtel, 2001)
  - Assistant professor at the Linguistics Department of the University of California (UCLA)
  - Professor of linguistics and computer science at the University of Geneva since 1988.
  - Dean of the Faculty of Humanities, Univ. of Geneva 2005-2011
  - Director of the Centre Universitaire D'informatique (CUI), Univ. of Geneva since 2013
- Main interests: natural language processing (parsing, terminology extraction, translation), theoretical syntax

**11.45am – 12.05pm**

## Secure Routing in Wireless Sensor Networks via POMDPs



Wireless sensor networks are being increasingly used for sustainable development. The task of routing in these resource-constraint networks is particularly challenging as they operate over prolonged deployment periods, necessitating optimal use of their resources. Moreover, due to the deployment in unattended environments, they become an easy target for attackers. In this paper, we propose a hierarchical POMDP based approach to make routing decisions with partial/limited information about the sensor nodes, in a secure and energy-efficient manner. We demonstrate in a large-scale simulation that the approach provides a better energy/packet delivery tradeoff than competing methods, and also validate these conclusions in a real-world testbed.

#### **About Athirai Aravazhi IRISSAPPANE (SCE & IMI)**

Athirai is currently a 4<sup>th</sup> year PhD student at Nanyang Technological University. She obtained her Bachelors in Computer Science from Pondicherry Engineering College, India and her Masters in Software Engineering from NUS. Her research interests include security and trust in multi-agent e-markets and sensor networks.

Her core supervisor is Assistant Professor ZHANG Jie, SCE.

**12.05pm – 12.25pm**

## HRI in Hospitals – Opportunities and Challenges



A lot of works have been done on human-robot interaction. The sub-systems, such as speech recognition, motion retargeting, emotion models, have been well investigated. However, most of the current HRI system are in the environment of laboratories, on-site tests, i.e. utilization of robots and robotic systems in a real application require more effort to put into. This presentation gives an idea of the challenges of distribute robots in a real scenario and how to utilize robot developed with current technology in the environment of local hospitals.

#### **About LI Bingbing (MAE & IMI)**

Li Bingbing is currently a 4<sup>th</sup> year PhD student at Nanyang Technological University. He received his B.Eng degree in MAE, NTU in 2011. His research interests include human motion retargeting, robot motion planning and human-robot interaction.

His core supervisor is Associate Professor CHEN I-Ming, MAE.

**12.25pm – 12.45pm**

## Medical Image Analysis in Ultrasound Images of the Thyroid Gland



Ultrasound (US) is the gold standard imaging modality used to screen the thyroid gland for disorders. The aim of this research work is to investigate into the different methods proposed for medical image analysis of the thyroid gland. Further, three new methods are proposed to automatically detect and segment multiple organs in the US images of the thyroid gland. The methods make use of speckles in the image, which are otherwise considered as noise, as sources of information to detect and segment the organs in US images. The methods are compared with each other and with state-of-the-art methods to prove the efficacy of the algorithms in performing medical image analysis. Manual segmentations obtained from two trained sonographers are used as ground truth to validate the algorithms.

#### **About Subbarao Nikhil NARAYAN (EEE & IMI)**

Nikhil S. Narayan is currently pursuing his PhD degree at Nanyang Technological University, and is in the 4<sup>th</sup> year of his studies. He received the B.E. degree in Electronics and Communication Engineering from Vishveshwariah Technological University, Belgaum, India, in 2009 and the M.Sc degree in Signal Processing from Nanyang Technological University, Singapore, in 2010. His research interests include medical image analysis, image enhancement, compression, inpainting, image tamper detection and restoration.

His core supervisor is Assistant Professor Pina MARZILIANO, EEE.