The 8th Asian Conference on Machine Learning

16 - 18 November 2016

University of Waikato, NZ

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Table of Contents

Map of S Block

Program at a Glance

WEDNESDAY *16 / 11 / 2016*

07 : 40 AM – 08 : 00 AM
Registration Open
S Block Foyer

08 : 20 AM – 09 : 20 AM
Tutorial 1
Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do
by Kai Ming Ting
S.1.01

Tutorial 3
Bayesian Nets from the Ground up
by Aish Fenton
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

10 : 00 AM – 10 : 40 AM
Morning Refreshments

10 : 40 AM – 11 : 40 AM
Tutorial 1
Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do
by Kai Ming Ting
S.1.01

Tutorial 3
Bayesian Nets from the Ground up
by Aish Fenton
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

12 : 00 PM – 01 : 00 PM
Lunch
No lunch provided on this day

01 : 00 PM – 02 : 00 PM
Industry Keynote Speaker
Aish Fenton
S.1.04

02 : 00 PM – 03 : 10 PM
Tutorial 2
Recent Advances in Distributed Machine Learning
by Taifeng Wang and Wei Chen
S.1.01

Tutorial 4
Deep Approaches to Semantic Matching for Text
by Yanyan Lan & Jiafeng Guo
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 2
First New Zealand Text Mining Workshop
S.1.04

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

03 : 20 PM – 04 : 00 PM
Afternoon Refreshments

04 : 00 PM – 05 : 10 PM
Tutorial 2
Recent Advances in Distributed Machine Learning
by Taifeng Wang and Wei Chen
S.1.01

Tutorial 4
Deep Approaches to Semantic Matching for Text
by Yanyan Lan & Jiafeng Guo
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 3
First New Zealand Text Mining Workshop
S.1.04

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

06 : 30 PM – 09 : 30 PM
Welcome Reception
Te Whare Iti - Academy

THURSDAY *17 / 11 / 2016*

08 : 00 AM – 08 : 20 AM
Registration Open
S Block Foyer

08 : 20 AM – 08 : 50 AM
House-keeping
S.1.04

08 : 50 AM – 09 : 30 AM
Keynote Speaker
by John Shawe-Taylor
Session Chair
Bob Durrant
S.1.04

09 : 30 AM – 10 : 00 AM
Morning Refreshment
S Block Foyer

10 : 00 AM – 10 : 40 AM
Session 1
Multilabel Classification, Text & Topic Mining (1)
Chaired by Wray Buntine
S.1.04

10 : 40 AM – 11 : 40 AM
Poster Session
Lunch
S Block Foyer

11 : 40 AM – 12 : 40 PM
Invited Speaker
by Albert Bifet
Session Chair
Geoff Holmes
S.1.04

12 : 40 PM – 02 : 20 PM
Session 2
Kernel Methods
Chaired by Bernhard Pfahringer
S.1.04

02 : 20 PM – 02 : 50 PM
Afternoon Refreshments
Poster Winner Announced

02 : 50 PM – 03 : 10 PM
Session 3
Learning Theory
Chaired by John Shawe-Taylor
S.1.04

03 : 10 PM – 03 : 20 PM
10 Minute break

03 : 20 PM – 04 : 40 PM
Session 4
Multilabel Classification, Text & Topic Mining (2)
Chaired by Steven Hoi
S.1.04

05 : 20 PM – 06 : 30 PM
Bus to Hobbiton
Check itinerary
Tour of Hobbiton at 06 : 15 PM
ACML 2016 Banquet Dinner
Bus will pick up attendees at **09 : 30 PM**

FRIDAY *18 / 11 / 2016*

08 : 00 AM – 08 : 20 AM
Registration Open
S Block Foyer

08 : 20 AM – 08 : 50 AM
Keynote Speaker
by Vincent Tseng
Session Chair
Albert Bifet
S.1.04

08 : 50 AM – 09 : 30 AM
Morning Refreshment
S Block Foyer

09 : 30 AM – 10 : 40 AM
Session 5
Best Papers
Chaired by Zhi-Hua Zhou
S.1.04

10 : 40 AM – 11 : 40 AM
Poster Session
Lunch
S Block Foyer

11 : 40 AM – 12 : 40 PM
Invited Speaker
by Tie-Yan Liu
Session Chair
Bernhard Pfahringer
S.1.04

12 : 40 PM – 02 : 20 PM
Session 6
Manifold & Metric Learning
Chaired by Stephen Marsland
S.1.04

02 : 20 PM – 02 : 50 PM
Afternoon Refreshments
Poster Winner Announced

02 : 50 PM – 03 : 10 PM
Session 7
Deep Learning Approaches
Chaired by Eibe Frank
S.1.04

03 : 10 PM – 03 : 20 PM
10 Minute break

03 : 20 PM – 04 : 40 PM
Session 8
Feature Selection & Dimensionality Reduction
Chaired by Bob Durrant
S.1.04

05 : 00 PM – 05 : 10 PM
ACML 2016 Conference Close

Welcome Messages by General Co-Chairs

Geoff Holmes
University of Waikato
New Zealand

Welcome to New Zealand for the 8th Asian Conference on Machine Learning (ACML2016). ACML2016 is a three-day program consisting of plenary and invited talks, tutorials, workshops, oral and poster presentations, and other social events in and around the University of Waikato, Hamilton.

The task of putting this all together has fallen on the shoulders of the Organizing Committee and they are to be congratulated for their hard work and perseverance. This year we trialled a concurrent journal track as well as the regular conference track. This led to a greater than usual number of submissions and we are indebted to our Program Co-Chairs Robert Durrant and Kee-Eung Kim, the ACML Steering Committee, our Senior Program Chairs, Program Chairs and additional reviewers for establishing a very high-quality technical program for ACML2016.

Aside from the task of constructing the technical program our thanks go to the local organizing committee of Hannah Te Puia (general administration), Peter Reutemann (webmaster) and Lyn Hunt (finance) who have gone to great lengths to keep the conference organization on track and within budget.

Stephen Marsland
Massey University
New Zealand

Our budget has been greatly assisted by the contributions of our sponsors the Asian Office of Aerospace Research and Development (AOARD), the Faculty of Computing and Mathematical Sciences, University of Waikato and 11Ants Analytics. We are also grateful for the wonderful facilities provided by the University of Waikato in hosting this event.

We would also like to thank the Steering Committee for their vote of confidence in accepting the University of Waikato as a host for ACML2016 in New Zealand. We have also received excellent advice from previous recent organizers of ACML in Singapore, Vietnam and Hong Kong.

Finally, we would like to thank the authors for submitting to ACML and you, the attendees – there would be no conference without you.

We hope you will be able to take time after the conference to explore the Waikato region and New Zealand more broadly.

Once again, welcome to ACML2016, we hope that you enjoy the program and have a stimulating and productive time at the conference.

Welcome Messages by Program Co-Chairs

Bob Durrant
University of Waikato
New Zealand

Kee-Eung Kim
KAIST
South Korea

Welcome to the eighth edition of the Asian Conference on Machine Learning, this year held at the University of Waikato, Hamilton, New Zealand. This edition continues the ACML tradition of high-quality and original research papers in the area of machine learning following seven previous successful ACML conferences.

We hope that you will enjoy the program of 34 research papers this year, 29 accepted papers from the conference track and a further 5 from the ACML journal track, which is new this year.

In addition to these research papers, we are very pleased to have keynotes from Professors John Shawe-Taylor (University College London) and Vincent Tseng (National Chiao Tung University), and invited talks from Tie-Yan Liu (Microsoft Beijing), Albert Bifet (Telecom ParisTech) and Aish Fenton (Netflix). As well as the main program, the Workshop and Tutorial chairs organised four tutorials on: Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do, Recent Advances in Distributed Machine Learning, Bayesian Nets from the ground up, and Deep Approaches to Semantic Matching for Text. In parallel to these tutorials, there are three workshops: The Asian Workshop on Reinforcement Learning, the First New Zealand Text Mining Workshop, and the ACML Workshop on Learning on Big Data. We thank all of the speakers and organizers for contributing to such a fantastic program.

In total there were 113 submissions to the conference track this year, of which 29 were accepted into the main program, for an acceptance rate of 25.7%. A strict double-blind reviewing process was enforced, and each paper was assigned with one meta-reviewer, and at least 3 reviewers. Expert opinion and reviews were provided by 31 senior program committee (SPC) members and 73 program committee (PC) members, and the Program Co-chairs considered all the PC and SPC reviews and meta-reviews to make the final decisions for the papers.

For the first time this year ACML also ran an additional journal track, which attracted 28 papers of which 5 were accepted for final publication in the Springer journal Machine Learning, for an acceptance rate of 17.9%.Overall the number of accepted papers at ACML 2016 was 34 from 141 submissions for a 24.1% total acceptance rate, and all accepted papers from either track receive both an oral and poster presentation in the program.

The Program Chairs would like to thank the ACML Steering Committee for their valuable advice and support during the whole process. General Chairs Geoff Holmes and Stephen Marsland worked hard to make sure the event ran smoothly. Stephen Marsland also took on the role of Publications Chair, and has done a great job in producing the conference proceedings. Special thanks also to the Local Co-Chairs Hannah Te Puia, Peter Reutemann and Lyn Hunt and our student volunteers, and to Alvin Yeo for fund-raising.

Last but not least, a big thank you to all participants of ACML 2016 without whom the conference would not happen – we hope that you have an enjoyable and fruitful conference.

Nau mai haere mai ki te Whare Wananga o Waikato!
Welcome to the University of Waikato!

Conference Organisation

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Stephen Marsland, Massey University, New Zealand

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Hannah Te Puia, University of Waikato, New Zealand

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Stephen Marsland, Massey University, New Zealand

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The University of Tokyo, Japan
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Masashi Sugiyama
Tao Qin
Truyen Tran
Liwei Wang
Wray Buntine
Eunho Yang
Yuh-Jye Lee
Min-Ling Zhang

Keynote Speaker

Structured Output Learning with a Margin

John Shawe-Taylor
University College London
United Kingdom

Date: 17th November 2016
Time: 08 : 30 AM - 09 : 30 AM
Venue: S.1.04

Abstract

Structured output learning has been developed to borrow strength across multidimensional classifications. There have been approaches to bounding the performance of these classifiers based on different measures such as microlabel errors with a fixed simple output structure. We present a different approach and analysis starting from the assumption that there is a margin attainable in some unknown or fully connected output structure.

The analysis and algorithms flow from this assumption but in a way that the associated inference becomes tractable while the bounds match those attained were we to use the full structure. There are two variants depending on how the margin is estimated. Experimental results show the relative strengths of these variants, both algorithmically and statistically.

Biography

John Shawe-Taylor is a professor at UCL where he directs the Centre for Computational Statistics and Machine Learning and heads the Department of Computer Science. His research has contributed to a number of fields ranging from graph theory through cryptography to statistical learning theory and its applications. However, his main contributions have been in the development of the analysis and subsequent algorithmic definition of principled machine learning algorithms founded in statistical learning theory. He has co-authored two influential text books on kernel methods and support vector machines. He has also been instrumental in coordinating a series of influential European Networks of Excellence culminating in the PASCAL networks.

Keynote Speaker

Big Data Learning for Interdisciplinary Applications: In-Depth View of Some Key Challenges

Vincent S. Tseng
National Chiao Tung University
Taiwan

Date: 18th November 2016
Time: 08 : 30 AM - 09 : 30 AM
Venue: S.1.04

Abstract

Nowadays, large volume of data is being collected at unprecedented and explosive scale in a broad range of application areas. Analytics on such big data deliver amazing value and can drive interdisciplinary applications in various aspects of our life, including healthcare, retail, financial services, mobile services, life sciences, etc. Decisions that previously were based on hypothetical models or just unreliable guesswork can now be made effectively and efficiently by learning from the big data itself. New wave of revolutions in various domains has jumped into this Big Data era with new opportunities and challenges arisen. In this talk, I will investigate some key challenges in Big Data Learning for interdisciplinary applications through in-depth observations from various aspects covering data preprocessing, key feature discovery, learning and modeling, post-processing, etc. Experiences from practical projects in different domains including biomedicine, social media, e-commerce, mobile sensing, etc., will be shared. Finally, some emerging research topics and potential opportunities underlying this topic will also be addressed accordingly.

Biography

Dr. Vincent S. Tseng is currently a Distinguished Professor at Department of Computer Science and Director of Center for Big Data Technologies and Applications in National Chiao Tung University Taiwan, R.O.C.. He received the PhD in Computer Science from National Chaio Tung University in 1997 and then joined EECS Computer Science Division of UC Berkeley as a research fellow during 1998-1999. He was the Chair for IEEE Computational Intelligence Society Tainan Chapter during 2013-2015 and the President of Taiwanese Association for Artificial Intelligence during 2011-2012. Dr. Tseng has a wide variety of research interests covering data mining, machine learning, biomedical informatics, mobile and Web technologies. He has published more than 300 research papers in referred journals and conferences as well as 15 patents (held and filed). He has been on the editorial board of a number of top-tier journals including IEEE Transactions on Knowledge and Data Engineering, ACM Transactions on Knowledge Discovery from Data, IEEE Journal of Biomedical and Health Informatics, etc. He has also been overseeing the directions and architecture of big data technical platforms and interdisciplinary applications for governmental and industrial units in Taiwan. He is also the recipient of 2014 K. T. Li Breakthrough Award and 2015 Outstanding Research Award by Ministry of Science and Technology Taiwan.

Invited Speaker

Massive Online Analytics for the Internet of Things (IoT)

Albert Bifet
Télécom ParisTech
France

Date: 17th November 2016
Time: 12 : 00 PM - 12 : 45 PM
Venue: S.1.04

Abstract

Big Data and the Internet of Things (IoT) have the potential to fundamentally shift the way we interact with our surroundings. The challenge of deriving insights from the Internet of Things (IoT) has been recognized as one of the most exciting and key opportunities for both academia and industry. Advanced analysis of big data streams from sensors and devices is bound to become a key area of data mining research as the number of applications requiring such processing increases. Dealing with the evolution over time of such data streams, i.e., with concepts that drift or change completely, is one of the core issues in stream mining. In this talk, I will present an overview of data stream mining, and I will introduce some popular open source tools for data stream mining.

Biography

Albert Bifet is Associate Professor at Telecom ParisTech and Honorary Research Associate at the WEKA Machine Learning Group at University of Waikato. Previously he worked at Huawei Noah's Ark Lab in Hong Kong, Yahoo Labs in Barcelona, University of Waikato and UPC BarcelonaTech. He is the author of a book on Adaptive Stream Mining and Pattern Learning and Mining from Evolving Data Streams. He is one of the leaders of MOA and Apache SAMOA software environments for implementing algorithms and running experiments for online learning from evolving data streams. He is serving as Co-Chair of the Industrial track of IEEE MDM 2016, ECML PKDD 2015, and as Co-Chair of BigMine (2015, 2014, 2013, 2012), and ACM SAC Data Streams Track (2016, 2015, 2014, 2013, 2012)

Invited Speaker

Tackling big-data and big-model challenges of deep learning

Tie-Yan Liu
Microsoft Research Asia
China

Date: 18th November 2016
Time: 12 : 00 PM - 12 : 45 PM
Venue: S.1.04

Abstract

The success of deep learning could be attributed to the availability of very big training data, the expressiveness of big deep models, and the computational power of GPU clusters. However, they are double-edged swords: it is costly or sometimes impossible to acquire sufficient labeled data for training; big models are usually hard to train and might exceed the capacity of GPU devices; it is non-trivial to distribute the training onto multiple nodes, with linear speed up and without accuracy loss. In this talk, I will introduce our recent research to address these challenges. First, I will introduce a technology called "dual learning", which leverages the fact that many AI tasks have dual forms to create a closed feedback loop to enable the effective learning from unlabeled data. Second, we study the case that deep learning model is large due to its fat output layer (i.e., with many categories to predict), and propose to map the outputs onto a 2-dimensional table to effectively compress the model. By taking recurrent neural networks (RNN) as example, we show that our technology can lead to better accuracy and several-orders-of-magnitude smaller model. Third, we discuss the embarrassment of parallel computation – synchronous parallelization is slow due to synchronization barrier; asynchronous parallelization hurts accuracy due to communication delay. We then introduce a novel technology that leverages Taylor expansion of the gradient function to compensate the delay in asynchronous parallelization. It can achieve linear speed up and an accuracy comparable to sequential algorithms. All the technologies introduced in this talk will soon be open-sourced through Microsoft CNTK.

Biography

Tie-Yan Liu is a principal researcher of Microsoft Research Asia. He is very well known for his pioneer work on learning to rank and computational advertising, and his recent research interests include deep learning and distributed machine learning. As a researcher in an industrial lab, Tie-Yan is making his unique contributions to the world. On one hand, many of his technologies have been transferred to Microsoft's products and online services. On the other hand, he has been actively contributing to academic communities. He is an adjunct/honorary professor of Carnegie Mellon University (CMU) and University of Nottingham. His papers have been cited for tens of thousands of times in refereed conferences and journals. He has won the best student paper award at SIGIR (2008), the most cited paper award at Journal of Visual Communications and Image Representation (2004-2006), the research break-through award at Microsoft Research (2012), and Top-10 Springer Computer Science books by Chinese authors (2015). He has been invited to serve as general chair, program committee chair, or area chair for a dozen of top conferences including SIGIR, WWW, KDD, NIPS, IJCAI, and AAAI, as well as associate editor/editorial board member of ACM Transactions on Information Systems, ACM Transactions on the Web, Information Retrieval Journal, and Foundations and Trends in Information Retrieval. Tie-Yan Liu is a senior member of IEEE and ACM.

Day 1 Schedule

Welcome Reception / Tutorials / Workshops / Industry Keynote Speaker

WEDNESDAY - 16 November 2016

07 : 40 AM

08 : 00 AM

Registration Open
S Block Foyer

08 : 20 AM

Tutorial 1
Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do)
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S.1.01

Tutorial 3
Bayesian Nets from the Ground up
by Aish Fenton
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 2
First New Zealand Text Mining Workshop
S.1.04

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

10 : 00 AM

Morning Refreshments

10 : 40 AM

Tutorial 1
Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do)
by Kai Ming Ting
S.1.01

Tutorial 3
Bayesian Nets from the Ground up
by Aish Fenton
S.1.02

Workshop 1
Asian Workshop on Reinforcement Learning (AWRL 2016)
S.1.03

Workshop 2
First New Zealand Text Mining Workshop
S.1.04

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

12 : 00 PM

Lunch

No lunch provided on this day

01 : 00 PM

Industry Keynote Speaker
Aish Fenton
S.1.04

02 : 00 PM

Tutorial 2
Recent Advances in Distributed Machine Learning
by Taifeng Wang and Wei Chen
S.1.01

Tutorial 4
Deep Approaches to Semantic Matching for Text
by Yanyan Lan & Jiafeng Guo
S.1.02

Workshop 1
Asian Workshop on Reinforcement Leanring (AWRL 2016)
S.1.03

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

03 : 40 PM

Afternoon Refreshments

04 : 00 PM

Tutorial 2
Recent Advances in Distributed Machine Learning
by Taifeng Wang and Wei Chen
S.1.01

Tutorial 4
Deep Approaches to Semantic Matching for Text
by Yanyan Lan & Jiafeng Guo
S.1.02

Workshop 1
Asian Workshop on Reinforcement Leanring (AWRL 2016)
S.1.03

Workshop 3
ACML Workshop on Learning on Big Data
S.1.05

05 : 20 PM

06 : 30 PM

Welcome Reception
Te Whare Iti - Academy

Day 2 Schedule

Keynote Speaker / Invited Speaker / Poster Session & Announcement / Tour & Banquet at Hobbiton

THURSDAY - 17 November 2016

08 : 00 AM

08 : 20 AM

House-keeping S.1.04

08 : 30 AM

Keynote Speaker
John Shawe-Taylor

Session Chair: *Bob Durrant*

S.1.04

09 : 30 AM

Morning Refreshment
S Block Foyer

10 : 00 AM

Session 1
Multilabel Classification, Text & Topic Mining (1)

Chaired by:
Wray Buntine

Non-Linear Smoothed Transductive Network Embedding with Text Information
Weizheng Chen, Xia Zhang, Jinpeng Wang, Yan Zhang, Hongfei Yan, Xiaoming Li

Long Short-term Memory Network over Rhetorical Structure Theory for Sentence-level Sentiment Analysis
Xianghua Fu, Wangwang Liu, Yingying Xu, Chong Yu, Ting Wang

Progressive Random k-Labelsets for Cost-Sensitive Multi-Label Classification
Hsuan-Tien Lin, Yu-Ping Wu

Enhancing Topic Modeling on Short Texts with Crowdsourcing
Xiaoyan Yang, Shanshan Ying, Wenzhe Yu, Rong Zhang, Zhenjie Zhang

11 : 10 AM

Poster Session
S Block Foyer

Lunch
S Block Foyer

12 : 00 PM

Invited Speaker
Albert Bifet
S.1.04

Session Chair: *Geoff Holmes*

12 : 45 PM

Session 2
Kernel Methods

Chaired by:
Bernhard Pfahringer

Multiple Kernel Learning with Data Augmentation
Khanh Nguyen, Trung Le, Vu Nguyen, Tu Nguyen, Dinh Phung

Cost Sensitive Online Multiple Kernel Classification
Doyen Sahoo, Steven Hoi, Peilin Zhao

Localized Multiple Kernel Learning - A Convex Approach
Yunwen Lei, Alexander Binder, Urun Dogan, Marius Kloft

Multi-view Kernel Completion
Sahely Bhadra, Samuel Kaski, Juho Rousu

Linearized Alternating Direction Method of Multipliers for Constrained Nonconvex Regularized Optimization
Linbo Qiao, Bofeng Zhang, Jinshu Su, Xicheng Lu

02 : 10 PM

Afternoon Refreshments

Poster Winner Announced

02 : 30 PM

Session 3
Learning Theory

Chaired by:
John Shawe-Taylor

Random Fourier Features For Operator-Valued Kernels
Romain Brault, Markus Heinonen, Florence d'Alché Buc

Secure Approximation Guarantee for Cryptographically Private Empirical Risk Minimization
Toshiyuki Takada, Hiroyuki Hanada, Yoshiji Yamada, Jun Sakuma, Ichiro Takeuchi

Learning from Survey Training Samples: Rate Bounds for Horvitz-Thompson Risk Minimizers
Stephan Clemencon, Patrice Bertail, Guillaume Papa

Learnability of Non-I.I.D.
Wei Gao, Xin-Yi Niu, Zhi-Hua Zhou

03 : 30 PM

10 minute break

03 : 40 PM

Session 4
Multilabel Classification, Text & Topic Mining (2)

Chaired by:
Steven Hoi

Modelling Symbolic Music: Beyond the Piano Roll
Christian Walder

Improving Distributed Word Representation and Topic Model by Word-Topic Mixture Model
Xianghua Fu, Ting Wang, Jing Li, Chong Yu, Wangwang Liu

Collaborative Topic Regression for Online Recommender Systems: An Online and Bayesian Approach
Chenghao Liu, Tao Jin, Steven Hoi, Peilin Zhao, Jianling Sun

Fast Collaborative Filtering from Implicit Feedback with Provable Guarantees
Sayantan Dasgupta

05 : 20 PM

Bus to Hobbiton
Check itinerary

06 : 15 PM

Tour of Hobbiton starts at 06 : 15 PM
ACML 2016 Banquet Dinner served at 07 : 45 PM

09 : 30 PM

Bus will pick up attendees at 09 : 30 PM

Day 3 Schedule

Keynote Speaker / Invited Speaker / Poster Session & Announcement / ACML 2016 Conference Close

FRIDAY - 18 November 2016

08 : 20 AM — **Registration Open**
S Block Foyer

08 : 30 AM — **Keynote Speaker**
Vincent Tseng
S.1.04
Session Chair: *Albert Bifet*

09 : 30 AM — **Morning Refreshment**
S Block Foyer

10 : 00 AM — **Session 5**
Best Papers
Chaired by:
Zhi-Hua Zhou
S.1.04

- **Unifying Topic, Sentiment & Preference in an HDP-Based Rating Regression Model for Online Reviews**
  Zheng Chen, Yong Zhang , Yue Shang , Xiaohua Hu
- **Simulation and Calibration of a Fully Bayesian Marked Multidimensional Hawkes Process with Dissimilar Decays**
  Kar Wai Lim, Young Lee, Leif Hanlen, Hongbiao Zhao
- **A Bayesian Nonparametric Approach for Multi-label Classification**
  Vu Nguyen, Sunil Gupta, Santu Rana, Cheng Li, Svetha Venkatesh
- **Hierarchical Probabilistic Matrix Factorization with Network Topology for Multi-relational Social Network**
  Haoli Bai, Zenglin Xu, Bin Liu, Yingming Li

11 : 10 AM — **Poster Session**
S Block Foyer

Lunch
S Block Foyer

12 : 00 PM — **Invited Speaker**
Tie-Yan Liu
S.1.04
Session Chair: *Bernhard Pfahringer*

12 : 45 PM — **Session 6**
Manifold & Metric Learning
Chaired by:
Stephen Marsland
S.1.04

- **A Unified Probabilistic Framework for Robust Manifold Learning and Embedding**
  Qi Mao, Li Wang, Ivor W. Tsang
- **Non-redundant Multiple Clustering by Nonnegative Matrix Factorization**
  Sen Yang, Lijun Zhang
- **Learning Feature Aware Metric**
  Han-Jia Ye, De-Chuan Zhan, Xue-Min Si, Yuan Jiang
- **Multitask Principal Component Analysis**
  Ikko Yamane, Florian Yger, Maxime Berar, Masashi Sugiyama
- **Learning Distance Metrics for Multi-Label Classification**
  Henry Gouk, Bernhard Pfahringer, Michael Cree

02 : 10 PM — **Afternoon Refreshments**

Poster Winner Announced

02 : 30 PM — **Session 7**
Deep Learning Approaches
Chaired by:
Eibe Frank
S.1.04

- **Bank of Weight Filters for Deep CNNs**
  Suresh Kirthi Kumaraswamy, PS Sastry, Kalpathi Ramakrishnan
- **Deep Gate Recurrent Neural Network**
  Yuan Gao, Dorota Glowacka
- **Collaborative Recurrent Neural Networks for Dynamic Recommender Systems**
  Young-Jun Ko, Lucas Maystre, Matthias Grossglauser
- **Echo State Hoeffding Tree Learning**
  Diego Marron, Jesse Read, Albert Bifet, Talel Abdessalem, Eduard Ayguade, José Herrero

03 : 40 PM — **10 minute break**

03 : 50 PM — **Session 8**
Feature Selection & Dimensionality Reduction
Chaired by:
Bob Durrant
S.1.04

- **Proper Inner Product with Mean Displacement for Gaussian Noise Invariant ICA**
  Liyan Song, Haiping Lu
- **An Efficient Approach for Multi-Sentence Compression**
  Elahe Shafiei, Mohammad Ebrahimi, Raymond K. Wong, Fang Chen
- **Geometry-aware stationary subspace analysis**
  Inbal Horev, Florian Yger, Masashi Sugiyama
- **EcoICA: Skewness-based ICA via Eigenvectors of Cumulant Operator**
  Liyan Song, Haiping Lu

05 : 00 PM — **ACML 2016 Conference Close**

Asian Workshop on Reinforcement Learning (AWRL 2016)

Date: 16th November 2016
Time: 08 : 20 AM - 12 : 00 PM and 02 : 00 PM - 05 : 20 PM
Venue: S.1.03

Overview

The first Asian Workshop on Reinforcement Learning (AWRL 2016) focuses on both theoretical models and algorithms of reinforcement learning (RL) and its practical applications. In the last few years, we have seen the growing interest in RL of researchers from different research areas and industries. We invite reinforcement learning researchers and practitioners to participate in this world-class gathering. We intend to make this an exciting event for researchers and practitioners in RL worldwide, not only for the presentation of top quality papers, but also as a forum for the discussion of open problems, future research directions and application domains of RL. AWRL 2016 will consist of keynote talks (TBA), contributed paper presentations, discussion sessions spread over a one-day period.

Reinforcement learning (RL) is an active field of research that deals with the problem of (single or multiple agents') sequential decision-making in unknown possibly partially observable domains, whose (potentially non-stationary) dynamics may be deterministic, stochastic or adversarial. RL's objective is to develop agents' capability of learning optimal policies in unknown environments (possibly in face of other coexisting agents) by trial-and-error and with limited supervision. Recent developments in exploration-exploitation, online learning, planning, and representation learning are making RL more and more appealing to real-world applications, with promising results in challenging domains such as recommendation systems, computer games, or robotics systems. We would like to create a forum to discuss interesting results both theoretically and empirically related with RL. The ultimate goal of this workshop is to bring together diverse viewpoints in the RL area in an attempt to consolidate the common ground, identify new research directions, and promote the rapid advance of RL research community.

Organizers

Jianye Hao, Tianjin University, China
Paul Weng, SYSU-CMU Joint Institute of Engineering, China
Yang Yu, Nanjing University, China
Zongzhang Zhang, Soochow University, China

First New Zealand Text Mining Workshop

Date: 16th November 2016
Time: 02 : 00 PM - 05 : 20 PM
Venue: S.1.04

Overview

In recent times, there has been an astronomical surge in demand for data scientists with Harvard Business Review naming Data Scientist as The Sexiest Job of the 21st Century.

The workshop will aim to foster collaboration among Data Science academics and practitioners focussing on text data. We have reached a point in Data Science where there is an increasing demand to integrate information from text data into models. This workshop calls for recent advances made both in the area of theoretical Text Processing dealing with lower level algorithms as well applications in Text Mining. The workshop aims to foster collaboration between academic researchers and practitioners so that the two groups could be able to integrate new advances in approaches into real world innovations being worked on by the practitioners.

Organizers

Parma Nand, Auckland University of Technology, New Zealand
Rivindu Perera, Auckland University of Technology, New Zealand

ACML Workshop on Learning on Big Data

Date: 16th November
Time: 08 : 20 AM - 12 : 00 PM and 02 : 00 PM - 05 : 20 PM
Venue: S.1.05

Overview

With the advance of data storage and Internet technology, data becomes more massive, noisier and more complex, which also brings good opportunities and challenges for machine learning. Learning technologies on Big Data have attracted many attentions. They have been successfully applied to many machine learning applications, including text mining, natural language processing, image categorization, video analysis, recommendation systems, sensor-based prediction problems, software engineering and so forth.

The aim of this workshop is to document recent process of Big Data technologies (e.g. Big Data Infrastructure, Distributed optimization, Stochastic optimization, MapReduce and Cloud Computing, etc.) in different real-world applications, to understand how computational bottlenecks trade-off with statistical efficiency for Big Data analysis tools, and also to stimulate discussion about potential challenges that may open new directions of learning on Big Data. We appreciate not only the manuscripts that dedicate to handle learning on Big Data, but also those which aim to discuss the approaches and/or theories for handling the new Big Data issues when exploiting massive data of different formats or structures.

Organizers

Ivor Wai-Hung Tsang, QCIS, University of Technology Sydney
Ling Chen, QCIS, University of Technology Sydney
Ying Zhang, QCIS, University of Technology Sydney
Joey Tianyi Zhou, IHPC, A*Star, Singapore

Tutorial 1: Mass Estimation: Enabling density-based or distance-based algorithms to do what they cannot do

Date: 16th November 2016
Time: 08 : 20 AM - 12 : 00 PM
Venue: S.1.01

Abstract
This tutorial provides an overview of mass estimation, an alternative data modelling mechanism to density estimation; and details how it can overcome fundamental weaknesses of density-based or distance-based algorithms to enable them to do what they cannot do previously.

Mass estimation is attractive because the basic measure, mass, is not only more fundamental than density, but also more versatile — mass can be used to do density estimation, as a means for subspace selection and to find multi-dimensional median, and can be extended to measure dissimilarity of any two points. Example advantages of mass over density or distance are given as follows: DEMass—Density estimator based on mass — runs orders of magnitude faster than kernel and kNN density estimators; Mass has been used, in place of density, as an effective means for subspace selection; Half-space mass is the maximally robust and efficient method to find multi-dimensional median. Existing methods such as data depth are either less robust or computationally more expensive; Simply replacing mass-based dissimilarity (a data dependent measure) with distance measure (a data independent measure) overcomes key weaknesses of density-based and distance-based methods in clustering, anomaly detection, information retrieval and classification.

This tutorial draws upon recent work on mass estimation and previous work which was also mass- based but was incorrectly categorised as density-based.

Organizer
Kai Ming Ting

Tutorial 2: Recent Advances in Distributed Machine Learning

Date: 16th November 2016
Time: 02 : 00 PM - 05 : 20 PM
Venue: S.1.01

Abstract
In recent years, artificial intelligence has demonstrated its power in many important applications. Besides the novel machine learning algorithms (e.g., deep neural networks), their distributed implementations play a very critical role in these successes. In this tutorial, we will first review popular machine learning models and their corresponding optimization techniques. Second, we will introduce different ways of parallelizing machine learning algorithms, i.e., data parallelism, model parallelism, synchronous parallelism, asynchronous parallelism, and so on, and discuss their theoretical properties, advantages, and limitations. Third, we will discuss some recent research works that try to overcome the limitations of standard parallelization mechanisms, including advanced asynchronous parallelism and new communication and aggregation methods. Finally, we will introduce how to leverage popular distributed machine learning platforms, such as Spark MILib, DMTK, Tensorflow, to parallelize a given machine learning algorithm, in order to give the audience some practical guidelines on this topic.

Organizers
Taifeng Wang and Wei Chen

Tutorial 3: Bayesian Nets from the ground up

Date: 16th November 2016
Time: 08 : 20 AM - 12 : 00 PM
Venue: S.1.02

Abstract
In this tutorial Aish will take us through Bayesian Networks (i.e. Directed Graphical Models) from the ground up. Many real-world problems in machine learning benefit from building custom models and explicitly stating your distributional assumptions. Graphical models provide a general methodology for doing this. They've found success in such diverse settings as bioinformatics, speech processing, and driving parts of Netflix's recommendation engine. Aish will start from the basics and build up to more advanced concepts, such as bayesian nonparametric extensions. By the end of the tutorial you should have a grasp on the theory underpinning Bayes nets, how to build your own models, and how to infer them.

Organizer
Aish Fenton

Tutorial 4: Deep Approaches to Semantic Matching for Text

Date: 16th November 2016
Time: 02 : 00 PM - 05 : 20 PM
Venue: S.1.02

Abstract
Semantic matching is critical in many text applications, including paraphrase identification, information retrieval, question answering, and machine translation. A variety of machine learning techniques have been developed for various semantic matching tasks, referred to as "learning to match". Recently, deep learning approaches have shown their effectiveness in this area, and a number of methods have been proposed from different aspects of matching. In this tutorial, we will give a systematic and detailed survey on newly developed deep learning technologies for semantic matching. We will focus on the descriptions on the fundamental problems, as well as the novel solutions from bridging the word level semantic gap and conducting sentence level end-to-end semantic matching. We will also discuss the potential applications and future directions of semantic matching for text.

Organizers
Yanyan Lan and Jiafeng Guo

Poster Sessions

Date: 17th November 2016
Time: 11 : 10 AM - 12 : 00 PM

Non-Linear Smoothed Transductive Network Embedding with Text Information

Weizheng Chen, Xia Zhang, Jinpeng Wang, Yan Zhang, Hongfei Yan, Xiaoming Li

Long Short-term Memory Network over Rhetorical Structure Theory for Sentence-level Sentiment Analysis

Xianghua Fu, Wangwang Liu, Yingying Xu, Chong Yu, Ting Wang

Progressive Random k-Labelsets for Cost-Sensitive Multi-Label Classification

Hsuan-Tien Lin, Yu-Ping Wu

Enhancing Topic Modeling on Short Texts with Crowdsourcing

Xiaoyan Yang, Shanshan Ying, Wenzhe Yu, Rong Zhang, Zhenjie Zhang

Multiple Kernel Learning with Data Augmentation

Khanh Nguyen, Trung Le, Vu Nguyen, Tu Nguyen, Dinh Phung

Cost Sensitive Online Multiple Kernel Classification

Doyen Sahoo, Steven Hoi, Peilin Zhao

Localized Multiple Kernel Learning-A Convex Approach

Yunwen Lei, Alexander Binder, Urun Dogan, Marius Kloft

Multi-view Kernel Completion

Sahely Bhadra, Samuel Kaski, Juho Rousu

Linearized Alternating Direction Method of Multipliers for Constrained Nonconvex Regularized Optimization

Linbo Qiao, Bofeng Zhang, Jinshu Su, Xicheng Lu

Random Fourier Features For Operator-Valued Kernels

Romain Brault, Markus Heinonen, Florence d'Alché Buc

Secure Approximation Guarantee for Cryptographically Private Empirical Risk Minimization

Toshiyuki Takada, Hiroyuki Hanada, Yoshiji Yamada, Jun Sakuma, Ichiro Takeuchi

Learning from Survey Training Samples: Rate Bounds for Horvitz-Thompson Risk Minimizers

Stephan Clemencon, Patrice Bertail, Guillaume Papa

Learnability of Non-I.I.D.

Wei Gao, Xin-Yi Niu, Zhi-Hua Zhou

Modelling Symbolic Music: Beyond the Piano Roll

Christian Walder

Improving Distributed Word Representation and Topic Model by Word-Topic Mixture Model

Xianghua Fu, Ting Wang, Jing Li, Chong Yu, Wangwang Liu

Collaborative Topic Regression for Online Recommender Systems: An Online and Bayesian Approach

Chenghao Liu, Tao Jin, Steven Hoi, Peilin Zhao, Jianling Sun

Date: 18th November 2016
Time: 11 : 10 AM - 12 : 00 PM

Unifying Topic, Sentiment & Preference in an HDP-Based Rating Regression Model for Online Reviews

Zheng Chen, Yong Zhang , Yue Shang , Xiaohua Hu

Simulation and Calibration of a Fully Bayesian Marked Multidimensional Hawkes Process with Dissimilar Decays

Kar Wai Lim, Young Lee, Leif Hanlen, Hongbiao Zhao

A Bayesian Nonparametric Approach for Multi-label Classification

Vu Nguyen, Sunil Gupta, Santu Rana, Cheng Li, Svetha Venkatesh

Hierarchical Probabilistic Matrix Factorization with Network Topology for Multi-relational Social Network

Haoli Bai, Zenglin Xu, Bin Liu, Yingming Li

A Unified Probabilistic Framework for Robust Manifold Learning and Embedding

Qi Mao, Li Wang, Ivor W. Tsang

Non-redundant Multiple Clustering by Nonnegative Matrix Factorization

Sen Yang, Lijun Zhang

Learning Feature Aware Metric

Han-Jia Ye, De-Chuan Zhan, Xue-Min Si, Yuan Jiang

Multitask Principal Component Analysis

Ikko Yamane, Florian Yger, Maxime Berar, Masashi Sugiyama

Learning Distance Metrics for Multi-Label Classification

Henry Gouk, Bernhard Pfahringer, Michael Cree

Bank of Weight Filters for Deep CNNs

Suresh Kirthi Kumaraswamy, PS Sastry, Kalpathi Ramakrishnan

Deep Gate Recurrent Neural Network

Yuan Gao, Dorota Glowacka

Collaborative Recurrent Neural Networks for Dynamic Recommender Systems

Young-Jun Ko, Lucas Maystre, Matthias Grossglauser

Echo State Hoeffding Tree Learning

Diego Marron, Jesse Read, Albert Bifet, Talel Abdessalem, Eduard Ayguade, José Herrero

Proper Inner Product with Mean Displacement for Gaussian Noise Invariant ICA

Liyan Song, Haiping Lu

An Efficient Approach for Multi-Sentence Compression

Elahe Shafiei, Mohammad Ebrahimi, Raymond K. Wong, Fang Chen

Geometry-aware stationary subspace analysis

Inbal Horev, Florian Yger, Masashi Sugiyama

EcoICA: Skewness-based ICA via Eigenvectors of Cumulant Operator

Liyan Song, Haiping Lu

Social Events

WELCOME RECEPTION

Date: 16th November
Time: 06 : 30 PM
Venue: Te Whare Iti - The Gallagher Academy of Performing Arts, The University of Waikato

Located on campus the Te Whare Tapere Iti is an open floor studio space with beautiful native bush and lake views through its 5 metre high ceiling-to-floor windows. This provides an excellent space for ACML 2016 participants to interact and socialise whilst being surrounded by a lake and native bush. You will find a ticket in your conference bag for one free drink at the Welcome Reception event. If you would like more to drink, please see the bar for pricing of their drinks.

CONFERENCE BANQUET

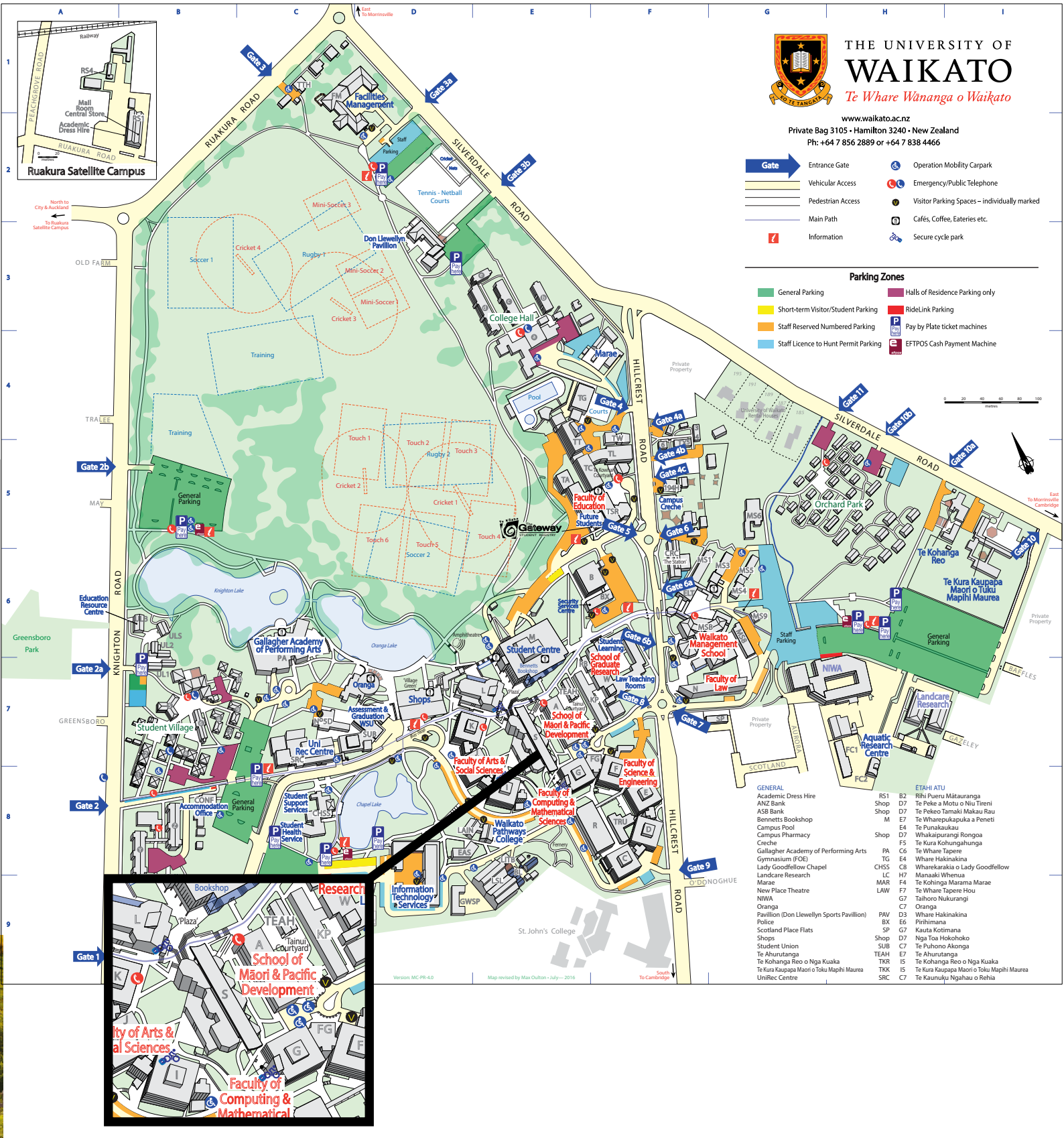
Date: 17th November
Time: 05 : 20 PM - 09 : 30 PM
Venue: Hobbiton (Movie Set from The Lord of the Rings and The Hobbit film trilogies), Matamata, Waikato

Matamata, home of the Hobbiton™ Movie Set, is a small agricultural town in the heart of the Waikato region, nestled at the base of the beautiful Kaimai ranges. During your tour you will see Hobbit Holes, The Green Dragon Inn, The Mill, double arched bridge and other structures and gardens built for the films. There will be red and white wine as well as Ginger Beer on the tables for attendees, however if you would like more, there will be a cash bar for you to buy from.

ITINERARY

05 : 20 PM	Buses leave from University of Waikato Shops to the Shires Rest
06 : 00 PM	Group arrive at the Shires Rest
06 : 15 PM	Groups begin their tour around Hobbiton
07 : 45 PM	Banquet dinner is served
09 : 30 PM	Buses depart Hobbiton back to University of Waikato shops

Location Maps



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