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Work Experience

Max Planck Institute for Intelligent Systems

Senior Scientist.

DUTIES: Conduct an independent research.

Tübingen, Germany

01.04.2018 – 31.01.2022

Department of Mathematics, Faculty of Science, Mahidol University

Lecturer in Mathematics.

DUTIES: Teach courses and conduct an independent research.

Bangkok, Thailand

04.01.2016 – 31.12.2017

Max Planck Institute for Intelligent Systems

Research Scientist.

DUTIES: Conduct an independent research.

Tübingen, Germany

01.06.2015 – 31.12.2015

Sirindhorn International Institute of Technology

Teaching Assistant, ITS100 Introduction to Programming in C.

DUTIES: Assist the instructor in the programming laboratory.

Pathumthani, Thailand

2010

Sirindhorn International Institute of Technology

Teaching Assistant, ITS050 Introduction to Programming in C.

DUTIES: Assist the instructor in the programming laboratory.

Pathumthani, Thailand

2008

Education

MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS

Ph.D. in Machine Learning (Summa Cum Laude)

SUPERVISOR: Prof. Bernhard Schölkopf

THESIS: “*From Point to Probability Measures : Statistical Learning on Distributions with Kernel Mean Embedding*”

DATE OF EXAMINATION: 30.09.2015

DATE OF AWARD: 21.12.2015 (**University of Tübingen**)

Tübingen, Germany

04.04.2011 – 31.05.2015

UNIVERSITY COLLEGE LONDON

M.Sc. in Machine Learning (Distinction)

MASTER THESIS: “*Infinite Independent Subspace Analysis*”

THESIS SUPERVISOR: Prof. Yee Whye Teh

M.Sc. TUTOR: Prof. John Shawe-Taylor

DATE OF AWARD: 01.11.2010

London, United Kingdom

10.2009 – 10.2010

SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY

B.Sc. in Computer Science (First Class Honor)

SCHOLARSHIP: Young Scientist and Technologist Programme (YSTP)

THESIS: “*Robust Graph Hyperparameter Learning for Graph-based SSL*”
“*Query Selection via Weighted Entropy for Graph-based SSL*”

GPA: 3.97/4.00 | Rank: 1/441

DATE OF AWARD: 26.03.2009

Pathumthani, Thailand

22.03.2005 – 26.03.2009

MAHIDOL WITAYANUSORN SCHOOL (PUBLIC ORGANISATION)

SCHOLARSHIP: Mahidol Wittayanusorn Scholarship

PROJECT: “*Moving Objects Detection in Video System*”

GPA: 3.91/4.00

Nakornpathom, Thailand

03.2002 – 03.2005

Research Interests

My research interest lies in the area of artificial intelligence, machine learning, statistical learning theory, and its applications. The topics of interest include, but not limited to

- Kernel methods in machine learning
- Learning in high dimensional space
- Causal learning and counterfactual prediction
- Bayesian inference and nonparametric models
- Computational astronomy
- Semi-supervised learning
- Multi-task and transfer learning
- Reinforcement Learning

Peer-Reviewed Publications

Journal ranking: Q1=Highest 25%, Q2=Top 50%–25%, Q3=Top 75%–50%, Q4=Bottom 25%
Conference ranking: A*=4%, A=14%, B=27%, C=50% (src: <http://portal.core.edu.au/conf-ranks/>)

Journal Articles

- (Q1) S. Klus, I. Schuster, K. Muandet, **Eigendecompositions of Transfer Operators in Reproducing Kernel Hilbert Spaces**, *Submitted*, 2018.
- (Q1) N. Shah, B. Tabibian, K. Muandet, I. Guyon, and U. von Luxberg, **Design and Analysis of NIPS 2016 Review Process**, *Journal of Machine Learning Research (Accepted)*, 2018.
- (Q1) I. Tolstikhin, B. Sriperumbudur, and K. Muandet, **Minimax Estimation of Kernel Mean Embeddings**, *Journal of Machine Learning Research*, 18(86):1–47, 2017.
- (Q1) K. Muandet, B. Sriperumbudur, K. Fukumizu, A. Gretton, and B. Schölkopf, **Kernel Mean Shrinkage Estimators**, *Journal of Machine Learning Research*, 17(48):1–41, 2016.
- (Q1) B. Schölkopf, K. Muandet, K. Fukumizu, and J. Peters, **Computing Functions of Random Variables via Reproducing Kernel Hilbert Space Representations**, *Statistics and Computing*, Volume 25, Issue 4, pp 755–766, 2015.
- (Q1) D. Lopez-Paz, K. Muandet, and B. Recht, **Randomized Causation Coefficient**, *Journal of Machine Learning Research*, 16(Dec) : 2901–2907, 2015.

Books

- (Q1) K. Muandet, K. Fukumizu, B. Sriperumbudur, and B. Schölkopf, **Kernel Mean Embedding of Distributions : A Review and Beyond**, *Foundations and Trends[®] in Machine Learning Series*, Volume 10: No. 1–2, pp 1–141, 2017 (ISBN: 9781680832884). Now Publishers.

Contributions to Books

- K. Zhang, B. Schölkopf, K. Muandet, Z. Wang, Z. Zhou, and C. Persello. **Single-Source Domain Adaptation with Target and Conditional Shift**, In *Regularization, Optimization, Kernels, and Support Vector Machines*, (Ed) JAK Suykens, M Signoretto, and A Argyriou, Chapman and Hall/CRC, Boca Raton, USA, 427–456

Conference Proceedings

- (A*) K. Muandet, M. Kanagawa, S. Saengkyongam, and S. Marukatat, **Counterfactual Mean Embedding: A Kernel Method for Nonparametric Causal Inference**, *Submitted*, 2018.
- (A) R. Babber, K. Muandet, and B. Schölkopf, **A Scalable Mixed-norm Approach for Learning Lightweight Models in Large-Scale Classification**, *SIAM International Conference on Data Mining (SDM 2016)*, pages 234–242, Miami, Florida, USA.
- (A*) D. Lopez-Paz, K. Muandet, B. Schölkopf, and Ilya Tolstikhin, **Towards a Learning Theory of Cause-Effect Inference**, *The 32nd International Conference on Machine Learning (ICML 2015)*, pages 1452–1461, Lille, France.

- (A*) [K. Muandet](#), B. Sriperumbudur, and B. Schölkopf, **Kernel Mean Estimation via Spectral Filtering**, *The 28th Annual Conference on Neural Information Processing Systems (NIPS 2014)*, pages 1-9. MIT Press, 2014.
- (A*) G. Doran, [K. Muandet](#), K. Zhang, B. Schölkopf, **A Permutation-Based Kernel Conditional Independence Test**. *the 30th Conference on Uncertainty in Artificial Intelligence (UAI 2014)*, pages 132–141. AUAI Press Corvallis, Oregon.
- (A*) [K. Muandet](#), K. Fukumizu, B. Sriperumbudur, A. Gretton, and B. Schölkopf, **Kernel Mean Estimation and Stein Effect**. *The 31st International Conference on Machine Learning (ICML 2014)*, pages 10–18, Beijing, China.
- (A*) K. Zhang, B. Schölkopf, [K. Muandet](#), and Z. Wang. **Domain Adaptation under Target and Conditional Shift**. *The 30th International Conference on Machine Learning (ICML 2013)*, pages 819–827, Atlanta, Georgia.
- (A*) [K. Muandet](#) and B. Schölkopf, **One-Class Support Measure Machines for Group Anomaly Detection**. *The 29th Conference on Uncertainty in Artificial Intelligence (UAI 2013)*, pages 449–458, AUAI Press, Corvallis, Oregon.
- (A*) [K. Muandet](#), D. Balduzzi, and B. Schölkopf, **Domain Generalization via Invariant Feature Representation**. *The 30th International Conference on Machine Learning (ICML 2013)*, pages 10–18, Atlanta, Georgia.
- (A*) [K. Muandet](#), K. Fukumizu, F. Dinuzzo, and B. Schölkopf, **Learning on Distributions via Support Measure Machines**, *The 26th Annual Conference on Neural Information Processing Systems (NIPS 2012)*, pages 10-18. MIT Press, 2012.
- [K. Muandet](#), S. Marukatat, and C. Nattee. **Query Selection via Weighted Entropy for Graph-based Semi-Supervised Classification**. In *Proceedings of the 1st Asian Conference on Machine Learning (ACML 2009)*, pages 278-292, Nanjing, China, 2009.
- (A) [K. Muandet](#), S. Marukatat, and C. Nattee. **Robust Graph Hyperparameter Learning for Graph-based Semi-Supervised Classification**. In *Proceedings of the 13th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD 2009)*, pages 98-109, Bangkok, Thailand, 2009.
- N. Patanachai, B. Uyyanonvara, C. Sinthanayothin, W. Tharanon, P. Sompot, and [K. Muandet](#). **PACS (Picture Archiving Communication System) for Dentistry**. *The 5th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, 2008. (ECTI-CON 2008)*, 1:77-80, May 2008.
- C. Sinthanayothin, [K. Muandet](#), B. Uyyanonvara, and W. Tharanon. **Development of Dental Software: Introducing ADTEC Dicom Viewer**. In *Bone and Dental Technology Symposium*, 2007.

Workshop Contributions

- (A*) [K. Muandet](#), M. Kanagawa, S. Saengkyongam, and S. Marukatat, **Counterfactual Mean Embedding: A Kernel Method for Nonparametric Causal Inference**, *ICML2018 Workshop on Machine Learning for Causal Inference, Counterfactual Prediction, and Autonomous Action (CausalML)*, Stockholm, Sweden, 2018.
- (A*) D. Lopez-Paz, [K. Muandet](#), and B. Recht, **The Randomized Causation Coefficient**, *NIPS2014 Workshop on Modern Nonparametrics 3: Automating the Learning Pipeline (oral presentation)*, Montreal, Canada, 2014.
- (A*) [K. Muandet](#), **Hilbert Space Embedding for Dirichlet Process Mixtures**. *NIPS2012 Workshop on Confluence Between Kernel Methods and Graphical Models (oral presentation)*, Lake Tahoe, Nevada, USA, 2012.

Master/PhD Thesis

- [K. Muandet](#). **From Points to Probability Measures: Statistical Learning on Distributions with Kernel Mean Embedding**, Doctoral Thesis, University of Tübingen, 2015.
- [K. Muandet](#). **Infinite Independent Subspace Analysis**, M.Sc. Thesis, University College London, 2010.

Unpublished Works

- [K. Muandet](#) and B. Schölkopf. **A Unifying View of Support Measure Machines, Support Vector Machines, and Parzen Window Classifiers**.
<http://krikamol.org/research/papers/smm-unifying.pdf>.

Research Grants and Funding

Research Grant for New Scholar (MRG Grant No. 6080206) : 592,000 THB	2017
RESEARCH TOPIC: Counterfactual mean embedding with applications in causal inference	
FUNDING AGENCY: <i>The Thailand Research Fund (TRF), Thailand</i>	
Research Supplement Grant : 200,000 THB	2016
FUNDING AGENCY: <i>Faculty of Science, Mahidol University, Thailand</i>	

Selected Research Projects

DS4: A Discriminative Spatial-Spectral Model for Speckle Suppression

A machine learning software that processes unocculted and highly speckled light in the P1640 spectroscopic coronagraph for the purpose of exoplanet detection.

Face-based Image Retrieval System

The system uses a human face as a query for searching and retrieving digital images in large databases. A face detection algorithm is used to detect faces, which are then compared with the query image. A promising similarity measure algorithm is used to compare the human face.

Dicom Viewer Software

This software enable us to read the DICOM images from cone beam CT (i-CAT) and display in axial, coronal, sagittal and panoramic views. The software also shows Cross Section View which is reconstructed as a cross plane image intersecting at a right angle with the panoramic line, relative position of mandibular canal. TMJ view is also another feature for assisting diagnostic of TMJ abnormalities.

Emotion Recognition from Speech

We develop the system that is able to recognise emotions from speech signals. Four types of features are used namely pitch-related, intensity-related, duration-related, and spectral-related features. The feature selection is performed using Principle Component Analysis (PCA). The results of the experiments are then compared among K-nearest neighbour, naive Bayes, and Support Vector Machine.

PACS (Picture Archiving Communication System) for Dentistry

PACS (Picture Archiving Communication System) is a system that manage and transfer information for dental field focusing on 2 main fields as follows. First application was to open Digital Imaging and Communications in Medicine (DICOM) files of patients inside the database via Local Area Network (LAN) and Hypertext Transfer Protocol (HTTP). Second application was to pass patients personal data and treatment data on the network by applying MySQL database.

ULookr : A Simple Search Engine

ULookr is a web-based search engine implemented in PHP. This software demonstrates how search engines work. Important modules of ULookr consists of web crawler, web indexer, and information retrieval modules.

Simulation of Traffic Light Control Using Reinforcement Learning

This research studied the application of reinforcement learning in the traffic light control. The system takes into account the number of cars at each junction and learn the optimal policy to control the traffic light.

Moving Object Detection in Video System

This project used many image processing techniques for detecting the moving objects in video scenes. The result of the system were quite promising. This project was also supported by National Electronics and Computer Technology Centre.

Information Management Application for Dormitory

The student housing management software

Professional Affiliations/Activities

The NIPS2017 Workshop on Learning on Distributions, Functions, Graphs and Groups, Co-organizer

California, USA

Co-located with the 31st Neural Information Processing Systems (NIPS2017)

08.12.2017

The Institute of Statistical Mathematics, Foreign Visiting Researcher

Tokyo, Japan

Invited to visit the Research Center for Statistical Machine Learning

03-24.07.2017

The 9th Asian Conference on Machine Learning (ACML2017), Workshop co-chair

Seoul, Korea

Invited to be one of the organizing committees

15.11.2017 – 17.12.2017

Dagstuhl Seminar : “New Directions for Learning with Kernels and Gaussian Processes” , <i>Invited participant</i> Participation in the seminar is by invitation only.	<i>Wadern, Germany</i> 27.11.2016 – 02.12.2016
Special Seminar : “Unravel the Mystery of AlphaGo, Deep Learning, and the Future of Artificial Intelligence” , <i>Co-organizer</i> Including invited speaker, distinguished panelists, and nearly 300 participants	<i>Bangkok, Thailand</i> 22.03.2016
Neural Information Processing Systems (NIPS2016) , <i>Program Manager</i> One of the program managers for NIPS2016 (with Ulrike von Luxburg, Isabelle Guyon, and Behzad Tabibian)	<i>Barcelona, Spain</i> 2015-2016
Machine Learning Summer School (MLSS2015) , <i>Speaker</i> I co-taught a practical on kernel methods MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS	<i>Tübingen, Germany</i> 13-24.07.2015
Machine Learning Summer School (MLSS2013) , <i>Student Volunteer</i> MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS	<i>Tübingen, Germany</i> 26.8-06.09.2013
Empirical Inference Symposium , <i>Co-organizer</i> In honor of the 75th birthday of Professor Vladimir V. Vapnik. MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS	<i>Tübingen, Germany</i> 8-10.12.2011
Machine Learning Journal Club , <i>Participant</i> GATSBY COMPUTATIONAL NEUROSCIENCE UNIT, UCL	<i>London, United Kingdom</i> 01.2010 – 10.2010
Image Technology Laboratory , <i>Research trainee</i> TOPIC: Machine learning in computer vision, e.g., face recognition NATIONAL ELECTRONICS AND COMPUTER TECHNOLOGY CENTRE	<i>Pathumthani, Thailand</i> 06.2007 – 06.2009
<i>Research trainee</i> TOPIC: Medical image processing ADVANCED DENTAL TECHNOLOGY CENTRE	<i>Pathunthani, Thailand</i> 06.2008 – 06.2009

Teaching/Supervision Experience

Supervised Students

Purin Klunklar, Weerapatra Charoenkitsupat, Siraporn Tongurai <i>Undergraduate Senior Project</i> , MAHIDOL UNIVERSITY	<i>Bangkok, Thailand</i> 06.2016-05.2017
Chirag Gupta , <i>Undergraduate Intern</i> Co-supervise with Ilya Tolstikhin and Bernhard Schölkopf MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS	<i>Tübingen, Germany</i> 06.2015-08.2015

Taught Courses

MAHIDOL UNIVERSITY, BANGKOK, THAILAND

SCMA446 : MACHINE LEARNING, <i>Undergraduate level</i>	<i>2nd Semester/2016</i>
SCMA181 : STATISTICS FOR MEDICAL SCIENCE, <i>Undergraduate level</i>	<i>2nd Semester/2016</i>
SCMA241 : COMPUTER PROGRAMMING, <i>Undergraduate level</i>	<i>1st Semester/2016</i>
SCIM301 : NUMERICAL ANALYSIS, <i>Undergraduate level</i>	<i>1st Semester/2016</i>
SCMA481 : TIME SERIES ANALYSIS, <i>Undergraduate level</i>	<i>1st Semester/2016</i>
SCMA115 : CALCULUS, <i>Undergraduate level</i>	<i>Summer Semester/2015</i>
SCMA165 : ORDINARY DIFFERENTIAL EQUATION, <i>Undergraduate level</i>	<i>2nd Semester/2015</i>
SCMA351 : LINEAR ALGEBRA, <i>Undergraduate level</i>	<i>2nd Semester/2015</i>
SCMA292 : MATH MODELLING : MACHINE LEARNING, <i>Undergraduate level</i>	<i>2nd Semester/2015</i>

Editorial Reviews

CZECH SCIENCE FOUNDATION, <i>Grant Proposal Reviewer</i>	2017
JOURNAL OF MACHINE LEARNING RESEARCH, <i>Peer Reviewer</i>	2015, 2016, 2017
NEUROCOMPUTING, <i>Peer Reviewer</i>	2014
IEEE TRANSACTION ON INFORMATION THEORY, <i>Peer Reviewer</i>	2017
IEEE TRANSACTION ON KNOWLEDGE AND DATA ENGINEERING, <i>Peer Reviewer</i>	2013
IEEE TRANSACTION ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, <i>Peer Reviewer</i>	2013, 2016
DATA MINING AND KNOWLEDGE DISCOVERY, <i>Peer Reviewer</i>	2013
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS), <i>Peer Reviewer</i>	2013 – 2015, 2018
INTERNATIONAL CONFERENCE ON MACHINE LEARNING (ICML), <i>Peer Reviewer</i>	2015, 2017
COMPUTATIONAL LEARNING THEORY (COLT), <i>Peer Reviewer</i>	2018
ASIAN CONFERENCE ON MACHINE LEARNING (ACML), <i>Senior Program Committee</i>	2017
INTERNATIONAL JOINT CONFERENCE ON ARTIFICIAL INTELLIGENCE (IJCAI), <i>Peer Reviewer</i>	2015
ARTIFICIAL INTELLIGENCE & STATISTICS (AISTATS), <i>Peer Reviewer</i>	2016
INTERNATIONAL CONFERENCE ON LEARNING REPRESENTATION (ICLR), <i>Peer Reviewer</i>	2018

Invited Talks/Presentations

“Ola Bratteli” Seminar, Department of Mathematics and Computer Science, Thammasat University	<i>Pathumthani, Thailand</i>
TOPIC: “The Foundation of Machine Learning and Its Applications”	19.10.2017
Facebook Artificial Intelligence Research (FAIR)	<i>New York, USA</i>
TOPIC: “Learning with Implicit Representation of Probability Distributions”	09.10.2017
A*STAR Artificial Intelligence Programme (A*AI)	<i>Singapore</i>
TOPIC: “Learning with Implicit Representation of Probability Distributions”	27.09.2017
Department of Computer Science, University of Toronto	<i>Toronto, Canada</i>
TOPIC: “Learning with Implicit Representation of Probability Distributions”	14.09.2017
RIKEN Center for Advanced Intelligence Project (AIP)	<i>Tokyo, Japan</i>
TOPIC: “Counterfactual Mean Embedding with Applications in Nonparametric Causal Inference”	09.03.2017
Faculty of Commerce and Accountancy, Chulalongkorn University	<i>Bangkok, Thailand</i>
TOPIC: “Causal Inference : A Machine Learning Perspective”	17.11.2016
Department of ICT, Mahidol University	<i>Bangkok, Thailand</i>
TOPIC: “Learning from Probability Distributions via Kernel Mean Embeddings”	26.08.2016
Department of Computer Science, Thammasat University	<i>Bangkok, Thailand</i>
TOPIC: “Kernel Methods and Applications”	28.03.2016
Department of Statistics, University of Oxford	<i>Oxford, UK</i>
TOPIC: “Learning from Probability Distribution via Kernel Mean Embedding”	01.12.2015
Center for Cosmology and Particle Physics, New York University	<i>New York, USA</i>
TOPIC: “Support Vector Machine, Support Measure Machine, and Quasar Target Selection”	19.12.2012
Astro Imaging Workshop	<i>Val Müstair, Switzerland</i>
TOPIC: “Support Measure Machine for Quasar Target Selection”	2012
Occam’s Razor Seminar	<i>Tübingen, Germany</i>
TOPIC: “Statistical Learning Theory”	2012
Asian Conference on Machine Learning	<i>Nanjing, China</i>

PAPER: "Query Selection via Weighted Entropy for Graph Based Semi-supervised Classification"	2009
The Pacific-Asia Conference on Knowledge Discovery and Data Mining	<i>Bangkok, Thailand</i>
PAPER: "Robust Graph Hyperparameter Learning for Graph Based Semi-supervised Classification"	2009
National Science and Technology Development Agency	<i>Pathumthani, Thailand</i>
TOPIC: "Robust Graph Hyperparameter Learning for Graph Based Semi-supervised Classification"	2009
Gatsby Computational Neuroscience Unit, UCL,	<i>London, United Kingdom</i>
TOPIC: "Research interest in machine learning"	2009
Bone and Dental Technology Symposium	<i>Bangkok, Thailand</i>
PAPER: "Development of dental software: Introducing ADTEC dicom viewer"	2007

Awards and Honours

NIPS2015 Best Reviewer Award, <i>Neural Information Processing Systems Foundation</i>	2015
NIPS2014 Travel Award, <i>Neural Information Processing Systems Foundation</i>	2014
NIPS2012 Travel Award, <i>Neural Information Processing Systems Foundation</i>	2012
Machine Learning Summer School Scholarship, <i>MLSS2011 Singapore</i>	2011
SCG Talent Scholarship, <i>The Siam Cement Foundation</i>	2008
Academic Excellence Award (Gold medal), <i>SIIT, Thammasat University</i>	2008
Academic Excellence Award, <i>SIIT, Thammasat University</i>	2005 – 2007
Academic Excellence Award, <i>Thammasat University</i>	2006 – 2007
Fundamental Information Technology Engineer Examination, <i>Information Technology Professional Council</i>	2007
Academic Excellence Award, <i>Professor Dr. Tab Nilanidhi Foundation</i>	2006
Young Scientist e-Passport, <i>the Ministry of Science and Technology</i>	2006
The 2nd prize in Young Scientist Competition in Computer Science and Engineering Projects, <i>National Electronics and Computer Technology Centre</i>	2005
Research Funding for Computer Science Project, <i>National Electronics and Computer Technology Centre</i>	2003
The 3rd Student in Honor Roll, <i>Mahidol Wittayanusorn School</i>	2003
The 1st Student in Honor Roll, <i>Princess Chulabhorn's College, Satun</i>	2002
Information Technology Associate Exam(ITAE), <i>National Electronics and Computer Technology Centre</i>	2002

Computer and Programming Skills

Operating Systems	UNIX, LINUX, OSX, WINDOW 98/XP/VISTA
Programming	PYTHON, R, C/C++, JAVA, \LaTeX , PHP, UNIX SHELL, SQL
Tools	WEKA, SCILAB, OCTAVE, MATLAB, JUPYTER NOTEBOOK
Libraries	OPENCV, GTK/GTKMM, TENSORFLOW

Languages

THAI: Fluent – First Language, ENGLISH: Fluent, GERMAN: Beginner