

# Wittawat Jitkrittum

GATSBY COMPUTATIONAL NEUROSCIENCE UNIT, UNIVERSITY COLLEGE LONDON

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## Education

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### PhD Candidate in Machine Learning

London, UK

GATSBY UNIT, UNIVERSITY COLLEGE LONDON

2013/9-2017/12 (expected)

- **Thesis:** Kernel-Based Distribution Features for Inference and Statistical Tests
- **Supervisor:** Arthur Gretton
- Courseworks: Probabilistic and Unsupervised Learning, Functional Analysis (audit), Theoretical Neuroscience

### M.Eng. in Computer Science

Tokyo, Japan

TOKYO INSTITUTE OF TECHNOLOGY

2010-2012

- **GPA:** 3.67/4.00 (honors)
- **Thesis:** Feature Selection via  $\ell_1$ -Penalized Squared-Loss Mutual Information
- **Supervisor:** Masashi Sugiyama
- Courseworks: Advanced Artificial Intelligence, Pattern Information Processing, Machine Learning, Advanced Data Analysis

### B.Sc. in Computer Science

Thailand

SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY (SIIT), THAMMASAT UNIVERSITY

2005-2009

- **GPA:** 3.93/4.00 (honors)
- **Senior Project:** Question Answering System for Thai Wikipedia
- **Supervisor:** Thanaruk Theeramunkong
- Courseworks: Calculus, Linear Algebra, Discrete Mathematics, Engineering Statistics, Numerical Optimization, Artificial Intelligence, Natural Language Processing

## Publications

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Code for most of the projects is published at <https://github.com/wittawatj>.

### JOURNAL ARTICLES

1. Kiyohito Iigaya, Aurelie Jolivald, **Wittawat Jitkrittum**, Iain Gilchrist, Peter Dayan, Elizabeth Paul, and Mike Mendl. Cognitive bias in ambiguity judgements: Using computational models to dissect the effects of mild mood manipulation in humans. *Plos One*, 2016
2. Makoto Yamada, **Wittawat Jitkrittum**, Leonid Sigal, Eric P. Xing, and Masashi Sugiyama. High-dimensional feature selection by feature-wise kernelized lasso. *Neural Computation*, 26(1), 2014
3. **Wittawat Jitkrittum**, Hirota Hachiya, and Masashi Sugiyama. Feature selection via  $\ell_1$ -penalized squared-loss mutual information. *IEICE Transactions*, 96-D(7):1513–1524, 2013

### PEER-REVIEWED CONFERENCE PAPERS

1. **Wittawat Jitkrittum**, Wenkai Xu, Zoltán Szabó, Kenji Fukumizu, and Arthur Gretton. A linear-time kernel goodness-of-fit test. In *NIPS*, 2017a. (To appear. Oral presentation, 1.2%)
2. **Wittawat Jitkrittum**, Zoltán Szabó, and Arthur Gretton. An adaptive test of independence with analytic kernel embeddings. In *ICML*, 2017b
3. **Wittawat Jitkrittum**, Zoltán Szabó, Kacper Chwialkowski, and Arthur Gretton. Interpretable distribution features with maximum testing power. In *NIPS*, 2016. (Oral presentation, 1.8%)
4. Mijung Park, **Wittawat Jitkrittum**, and Dino Sejdinovic. K2-ABC: Approximate Bayesian computation with kernel embeddings. In *AISTATS*, 2016. (The first two authors contributed equally. Oral presentation, 6.5%)
5. Mijung Park, **Wittawat Jitkrittum**, Ahmad Qamar, Zoltán Szabó, Lars Buesing, and Maneesh Sahani. Bayesian manifold learning: The locally linear latent variable model. In *NIPS*, 2015. (Acceptance: 21.8%)
6. **Wittawat Jitkrittum**, Arthur Gretton, Nicolas Heess, S. M. Ali Eslami, Balaji Lakshminarayanan, Dino Sejdinovic, and Zoltán Szabó. Kernel-based just-in-time learning for passing expectation propagation messages. In *UAI*, 2015
7. Gang Niu, **Wittawat Jitkrittum**, Bo Dai, Hirota Hachiya, and Masashi Sugiyama. Squared-loss mutual information regularization: A novel information-theoretic approach to semi-supervised learning. In *ICML*, 2013
8. Choochart Haruechaiyasak, Chatchawal Sangkeettrakarn, and **Wittawat Jitkrittum**. Managing offline educational web contents with search engine tools. In *International Conference on Asia-Pacific Digital Libraries*, 2007

## WORKSHOP PAPERS

1. Vincent Adam, Joana Soldado-Magraner, **Wittawat Jitkrittum**, Heiko Strathmann, Balaji Lakshminarayanan, Alessandro Davide Ialongo, Gergo Bohner, Ben Dongsung Huh, Lea Goetz, Shaun Dowling, Julian Vlad Serban, and Matthieu Louis. Performance of synchrony and spectral-based features in early seizure detection: exploring feature combinations and effect of latency. *International Workshop on Seizure Prediction (IWSP) 2015: Epilepsy Mechanisms, Models, Prediction and Control*, 2015
2. **Wittawat Jitkrittum**, Choochart Haruechaiyasak, and Thanaruk Theeramunkong. QAST: question answering system for Thai wikipedia. In *Proceedings of the 2009 Workshop on Knowledge and Reasoning for Answering Questions*, KRAQ '09. ACL, 2009
3. Choochart Haruechaiyasak, **Wittawat Jitkrittum**, Chatchawal Sangkeettrakarn, and Chaianun Damrongrat. Implementing news article category browsing based on text categorization technique. In *Web Intelligence/IAT Workshops*, 2008

## Experience

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### Graduate Course Teaching Assistant

*University College London*

COURSE: REPRODUCING KERNEL HILBERT SPACES IN MACHINE LEARNING

2016

- Duties include marking assignments, and answering course related questions.

### Graduate Course Teaching Assistant

*Gatsby Unit, UCL*

COURSE: PROBABILISTIC AND UNSUPERVISED LEARNING

2014

- Duties include marking assignments, organizing weekly tutorials, and answering course related questions.

### Lab Instructor

*SIIT*

BASIC C, JAVA, PROGRAMMING AND WEB DEVELOPMENT

2012-2013

- Prepared teaching materials and led hands-on programming sessions.
- Teaching evaluation: 4.8/5.0. Class sizes: 30-40.

### Research Assistant

*SIIT*

RESEARCH ON TEXT RETRIEVAL WITH DR. THANARUK THEERAMUNKONG

2009-2010

- Collaboratively studied the use of association rule mining techniques for discovering relations among Thai news articles.
- Implemented a server-sided online application in Java to automatically find news relations as the news are crawled by a web crawler.

### Undergraduate Course Teaching Assistant

*SIIT*

BASIC C, JAVA, AND DATABASE SYSTEMS.

2008-2010

- Supervise students in lab sessions on basic C, Java programming, and database systems.

### Research Assistant

*NECTEC, Thailand*

RESEARCH ON THAI LANGUAGE PROCESSING WITH DR. CHOOCHART HARUECHAIYASAK

2007-2008

- At Human Language Technology Lab, National Electronics and Computer Technology Center (NECTEC), Thailand
- Empirically studied standard dimensionality reduction techniques and classification algorithms to increase the accuracy of Thai news article categorization.
- Designed and implemented a standalone search engine tool (in Java) that allows users to manage, archive and retrieve contents without an Internet connection. Thousands of CD-ROMs containing the tool were distributed to schools in remote areas.

## Talks

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- 2017/2 **Invited Talk**, An Adaptive Test of Independence with Analytic Kernel Embeddings. At the  $2^{nd}$  Probabilistic Graphical Model Workshop, The Institute of Statistical Mathematics.
- 2016 **Oral Presentation**, Interpretable Distribution Features With Maximum Testing Power. *NIPS*
- 2016 **Oral Presentation**, K2-ABC: Approximate Bayesian Computation with Kernel Embeddings. *AISTATS*
- 2016/3 **Invited Talk**, Interpretable Distribution Features With Maximum Testing Power. At Sugiyama-Sato Lab, University of Tokyo.
- 2016/3 **Invited Talk**, Improving Approximate Bayesian Inference with Kernel Methods. At Probabilistic Graphical Model Workshop, The Institute of Statistical Mathematics.

## Activities

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- 2016/9 **Programming Tutor**, At Gatsby Unit boot camp for new PhD students. Co-organized a 5-day Python-Matlab programming course. Created teaching materials, designed short programming exercises (infer the trajectory of a simulated 2D robot) and tutored.
- 2016/3, **Visiting Researcher**, The Institute of Statistical Mathematics, Tokyo, Japan. Hosted by Prof. Kenji Fukumizu.
- 2017/3
- 2016 **Publicity Chair**, AISTATS 2016.

- Since 2015 **Conference Reviewer**, ACML 2017, ICLR 2017, AISTATS 2017, NIPS 2015-2017, ICML 2016-2017, NIPS Workshop on Advances in Approximate Bayesian Inference 2015-2016.
- 2014 - 2017/7 **Machine Learning Journal Club Organizer**, Gatsby Unit, UCL.
- 2014/9 **Workshop Volunteer**, Attended and helped organize UCL-Duke 2-day Workshop on Sensing and Analysis of High-Dimensional Data at UCL.
- 2014/8 **Data Mining Competition**, Participated in a Kaggle Competition on predicting seizures from intracranial EEG recordings. Final world rank of our team was 9 out of 205.

## Awards & Scholarships

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### Gatsby Unit Studentship

*Gatsby Unit, UCL*

FULL SCHOLARSHIP FOR PHD STUDY

*2013-present*

- Full scholarship with stipend from the Gatsby Charitable Foundation for PhD study at Gatsby Unit, University College London. Awarded to 2-4 students per year.

### Okazaki Kaheita Scholarship

*Japan*

FULL SCHOLARSHIP FOR MASTER STUDY

*2010-2012*

- Full scholarship with stipend for master study in Japan. Awarded to only one student per country once every three years.

### National Software Contest Award

*Thailand*

SOFTWARE DEVELOPMENT COMPETITION AWARD

*2010*

- 2<sup>nd</sup> place at National Software Contest 2010 with the project “Thai Text Tokenization with a Binary Classifier” in “Thai Language Processing” category.
- Instead of commonly used expensive word sequence modelling techniques, we use a decision tree to classify each character into either “word beginning” or “not word beginning” based on character-level features generated from local context. This approach offers a very fast tokenizer while achieving a comparable accuracy (95.5%) to commonly used techniques such as the conditional random field.

### National Software Contest Award

*Thailand*

SOFTWARE DEVELOPMENT COMPETITION AWARD

*2009*

- 2<sup>nd</sup> place at National Software Contest 2009 with the project “Question Answering System for Thai Wikipedia” in “Software for Scientific Development” category.
- Developed one of the first factoid Thai question answering systems using Thai Wikipedia as the knowledge base. Two types of information are used for answering questions: (1) structured information extracted and stored in the form of Resource Description Framework (RDF), and (2) unstructured texts stored in a search index for keyword-based search.

### Silver Medal for High Academic Rank

*Thailand*

RANKED SECOND AMONG SENIOR-YEAR COMPUTER SCIENCE STUDENTS AT SIIT.

*2009*

### Senior Project Financial Support

*Thailand*

RESEARCH FUNDING

*2008-2009*

- Financial support for the senior project titled “Question Answering System for Thai Wikipedia” From Young Scientist and Technologist Programme, National Science and Technology Development Agency.

### Good Academic Performance Scholarship

*Thailand*

SCG TALENT SCHOLARSHIP, THE SIAM CEMENT GROUP

*2008*

- A competitive scholarship awarded to 3-5 senior-year students from top universities.

### Scholarship for an Intensive Japanese Course

*Thailand*

THAI WACOAL PUBLIC COMPANY LIMITED

*2004-2005*

- One-year full scholarship for an intensive Japanese program at Waseda Education (Thailand).

## Skills

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### TOOLS

- Most Experienced** Python, Matlab, Latex, Lyx
- Experienced** Java, C, PHP, HTML/CSS, MySQL, Javascript
- Some Experience** C# (Infer.NET), Theano, TensorFlow
- Others** Git, Linux, Basic Linux server administration, Arduino C

### LANGUAGES

- Thai** Native
- English** Full professional proficiency. TOEFL iBT: 103/120 (2012)
- Japanese** Professional working proficiency. Japanese-Language Proficiency Test (JLPT) Level 1 (2006)
- Chinese** Elementary proficiency