

# Rizal Fathony

UIC SEL 4211, 950 South Halsted Street  
Chicago, Illinois, USA, 60607  
✉ [rfatho2@uic.edu](mailto:rfatho2@uic.edu)  
🌐 <http://rizal.fathony.org>

## Education

- May 2014 – **PhD, Computer Science**, *University of Illinois at Chicago*, Chicago, Illinois, USA.  
Present Advisor: Prof. Brian D. Ziebart.  
2012 – 2014 **MS, Computer Science**, *University of Illinois at Chicago*, Chicago, Illinois, USA.  
2003 – 2007 **BS, Statistical Computing**, *Institute of Statistics*, Jakarta, Indonesia.

## Research

### 2015–Present **Performance-Aligned Learning Algorithms with Statistical Guarantees.**

The goal of many prediction tasks in machine learning is to learn a prediction function that minimizes certain loss functions (e.g. zero-one, and ordinal loss) or maximizes certain performance metrics (e.g. accuracy, precision, recall, F-score, and ROC curve). The prevalent techniques in machine learning, probabilistic and large-margin approaches, suffer from the inability to easily incorporate the metrics into the learning process or the lack of statistical guarantee of Fisher consistency. My research focuses on designing learning algorithms that simultaneously align with the learning objective by incorporating the performance metrics or loss functions into the learning process and provide the statistical guarantee of Fisher consistency. My approach in constructing learning algorithms is based on the robust adversarial formulation for many prediction tasks such as multiclass classification, ordinal regression, weighted bipartite matching, structured prediction, and graphical models.

Interest surrogate loss, statistical consistency, robust adversarial formulation, structured performance metrics, structured prediction, graphical models, game theory, multi-task learning, deep learning.

## Publications

- Conference **Rizal Fathony\***, Sima Behpour\*, Xinhua Zhang, Brian D. Ziebart. *Efficient and Consistent Adversarial Bipartite Matching*. International Conference on Machine Learning (ICML), 2018.  
**Rizal Fathony**, Mohammad Bashiri, Brian D. Ziebart. *Adversarial Surrogate Losses for Ordinal Regression*. Advances in Neural Information Processing Systems (NIPS), 2017.  
**Rizal Fathony**, Anqi Liu, Kaiser Asif, Brian D. Ziebart. *Adversarial Multiclass Classification: A Risk Minimization Perspective*. Advances in Neural Information Processing Systems (NIPS), 2016.
- Submission **Rizal Fathony**, Ashkan Rezaei, Mohammad Bashiri, Xinhua Zhang, Brian D. Ziebart. *Distributionally Robust Graphical Models*. Submitted to NIPS 2018.
- Preprint Anqi Liu, **Rizal Fathony**, Brian D. Ziebart. *Kernel Robust Bias-Aware Prediction under Covariate Shift*. ArXiv Preprints, 2016.

## Ongoing Research

- 2018 Adversarial Surrogate Losses for Multivariate Performance Measures.  
2018 Adversarial Surrogate Losses for Taxonomy Classification.

## Teaching Experience

- 2016 - 2016 CS 412 Introduction to Machine Learning (Fall '15, Spring '16, Fall '16), *UIC*, Teaching Assistant.

---

## Work Experience

- 2016 – Present **Research Assistant**, *University of Illinois at Chicago*, Chicago, Illinois, USA, Research Assistant at Prof. Brian Ziebart's lab.
- May – August 2017 **Research Intern**, *Technicolor Research AI Lab*, Los Altos, California, USA, Research Intern in deep learning area, especially in generative adversarial networks (GAN) architectures and applications.
- 2015 – 2016 **Teaching Assistant**, *University of Illinois at Chicago*, Chicago, Illinois, USA, Teaching Assistant for the "Introduction to Machine Learning" class.
- 2008 – 2012 **Statistical Dissemination System Developer**, *Central Bureau of Statistics*, Jakarta, Indonesia.

---

## Honors and Awards

- 2017 NIPS Travel Award 2017.
- 2016 NIPS Travel Award 2016.
- 2012 – 2014 International Fulbright Master of Science and Technology Scholarship Award.
- 2010 Runner Up Developer at Indonesia Open Source Festival - Android Apps Competition.
- 2009 Nominee of Research and Development Category at Asia Pacific Information and Communication Technology Award (APICTA), Melbourne, Australia.
- 2009 Best Research and Development Category at Indonesia Information and Communication Technology Award (INAICTA), Jakarta, Indonesia.
- 2003 – 2007 Grantee of a full scholarship from the Indonesian government during my undergraduate study.

---

## Project Experience

- 2017 Diverse Colorization using Conditional Wasserstein GAN  
Techniques: Wasserstein GAN | Tools: Python, PyTorch
- 2016 Image Inpainting (Context-Based Completion) using Deep Learning (CNN and GAN)  
Techniques: Convolutional NN, Generative Adversarial Nets | Tools: Lua, Torch
- 2015 Automatic Scoring System for Short Answer Essays  
Techniques: n-gram, syntactic features, SVM, Gradient Boosting | Tools: Python, NLTK, Scikit-Learn
- 2014 Hand Tracking Prediction using Kinect and Leap Motion Sensor  
Techniques: Kalman Filter, Inverse LQR | Tools: Python, ROS, Scikit-Learn
- 2013 Next Stay Location Prediction using GPS Trajectory Data  
Techniques: Probabilistic Suffix Tree, Markov Model | Tools: Java
- 2012 Twitter Sentiment Analysis of the 2012 US Presidential Election  
Techniques: Naive Bayes, SVM | Tools: Java, Rapid Miner
- 2011 Statistical Dissemination System for Indonesian Population Census  
Tools: PHP, Javascript, OpenLayers
- 2007 – 2009 Open Source Time Series Analysis Software (Zaitun Time Series)  
Techniques: Moving Average, Exponential Smoothing, Correlogram, Neural Networks | Tools: C#

---

## Programming Language Experience

- Scientific Advanced: *Julia, Python, Matlab, R*; Intermediate: *Lua*
- General Advanced: *C#, Java, Python*; Intermediate: *C, C++, Javascript*; Beginner: *Scala, Swift*
- Library Advanced: *PyTorch, KNet, Numpy, Scipy*; Intermediate: *TensorFlow, MXNet*