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Rizal Fathony

Education

May 2014 – Dec 2018 **PhD, Computer Science**, *University of Illinois at Chicago*, Chicago, Illinois, USA.
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**, 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***, Sima Behpour*, Xinhua Zhang, Brian D. Ziebart. *Efficient and Consistent Adversarial Bipartite Matching*. Submitted to ICML 2018.

Preprint Anqi Liu, **Rizal Fathony**, Brian D. Ziebart. *Kernel Robust Bias-Aware Prediction under Covariate Shift*. ArXiv Preprints, 2016.

Ongoing Research

2018 Tree-Structured Adversarial Graphical Models.

2018 Adversarial Surrogate Losses for Taxonomy Classification.

Teaching Experience

Fall 2016 CS 412 Introduction to Machine Learning (Fall 2016), *UIC*, Teaching Assistant.

Spring 2016 CS 412 Introduction to Machine Learning (Spring 2016), *UIC*, Teaching Assistant.

Fall 2015 CS 491 Introduction to Machine Learning (Fall 2015), *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*