BIOGRAPHICAL SKETCH

Born in New York City, USA
B.S. 1983, Florida Atlantic University, Boca Raton, Florida
M.S. 1987, Florida Atlantic University, Boca Raton, Florida
Ph.D. 2017, Florida Atlantic University, Boca Raton, Florida

CONCERNING PERIOD OF PREPARATION & QUALIFYING EXAMINATION

Time in Preparation: 2015—2017

Qualifying Examination Passed: Spring 2015

Selected Published Papers:

A Survey of Transfer Learning, *Journal of Big Data*, vol. 3, no. 1, 2016.

Designing a Testing Framework for Transfer Learning Algorithms, *2016 IEEE International Conference on Information Reuse and Integration (IRI)*, pp. 152-159, 2016.

An Investigation of Transfer Learning and Traditional Machine Learning Algorithms, *2016 IEEE 28th International Conference on Tools with Artificial Intelligence (ICTAI)*, pp. 283-290, 2016.

Comparing Transfer Learning and Traditional Learning Under Domain Class Imbalance, *2017 16th IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2017.

Detection of Phishing Webpages using Heterogeneous Transfer Learning, *IEEE International Conference on Collaborations and Internet Computing*, pp. 190-197, 2017.

FAU

COLLEGE OF ENGINEERING & COMPUTER SCIENCE
Florida Atlantic University

FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

announces the

Ph.D. Dissertation Defense

of

KARL ROBERT WEISS

for the degree of

DOCTOR OF PHILOSOPHY (PH.D.)

Nov. 3, 2017 at 11 a.m.

in

Engineering East, Room 405

777 Glades Road

Boca Raton, FL

DEPARTMENT: Computer and Electrical Engineering and Computer Science

DISSERTATION TITLE: “Design of a Test Framework for the Evaluation of Transfer Learning Algorithms”

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ABSTRACT OF DISSERTATION

Design of a Test Framework for the Evaluation of Transfer Learning Algorithms

A traditional machine learning environment is characterized by the training and testing data being drawn from the same domain, therefore having similar distribution characteristics. In contrast, a transfer learning environment is characterized by the training data having different distribution characteristics from the testing data. Previous research on transfer learning has focused on the development and evaluation of transfer learning algorithms using real-world datasets. Testing with real-world datasets exposes an algorithm to a limited number of data distribution differences and does not exercise an algorithm's full capability and boundary limitations. In this research, we define, implement, and deploy a transfer learning test framework to test machine learning algorithms. The transfer learning test framework is designed to create a wide-range of distribution differences that are typically encountered in a transfer learning environment. By testing with many different distribution differences, an algorithm's strong and weak points can be discovered and evaluated against other algorithms. This research additionally performs case studies that use the transfer learning test framework. The first case study focuses on measuring the impact of exposing algorithms to the Domain Class Imbalance distortion profile. The next case study uses the entire transfer learning test framework to evaluate both transfer learning and traditional machine learning algorithms. The final case study uses the transfer learning test framework in conjunction with real-world datasets to measure the impact of the base traditional learner on the performance of transfer learning algorithms. These case studies will be of interest to researchers who develop and improve transfer learning algorithms. This research will also be of benefit to machine learning practitioners in the selection of high-performing transfer learning algorithms.