JooSeuk Kim

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OBJECTIVE

Seeking a full-time job position as a researcher, specializing in statistical machine learning

EDUCATION

2007 - present — UNIVERSITY OF MICHIGAN — Ann Arbor, MI
Ph.D. candidate in Electrical Engineering and Computer Science
(Expected graduation date: May, 2011)
Research Interest: statistical learning theory, kernel methods for density estimation and classification problems, support vector machines, dimensionality reduction

April 2007 — UNIVERSITY OF MICHIGAN — Ann Arbor, MI
M.S.E in Electrical Engineering and Computer Science
Major: Signal Processing, Minor: Communication (GPA: 8.42/9.0)

February 2002 — SEOUL NATIONAL UNIVERSITY — Seoul, Korea
B.S in Electrical Engineering (GPA: 3.43/4.3)

ACADEMIC PROJECTS

Design and Analysis of a Perceptual Audio Coding System
- Designed, implemented and analyzed a transform coder for digital audio signals based on a psychoacoustic/perceptual model
- Evaluated the performance of the system by the comparison with standard MP3 coders using quality performance measures such as ODG (Objective Difference Grade) as well as SNR

Density Estimation Using Weighted Gaussian Kernel
- Modeled a nonparametric kernel density estimator and proposed an optimization criterion using weighted Gaussian kernel
- Implemented MATLAB code to solve a convex optimization problem

Phase retrieval based on an Iterative Fourier Transform algorithm
- Estimated Fourier phase from Fourier magnitude only based on iterative algorithms: ER (Error Reduction), HIO (Hybrid Input-Output) and mixed of ER and HIO algorithms
- Investigated an underlying theory by mathematical analysis and implemented MATLAB code
- Experimented with various image datasets and discussed the effect of several parameters

WORK EXPERIENCE

2002 – 2004 — **Software Developer,** AhnLab, Inc. — Seoul, Korea
- Designed and developed several modules for anti-virus software
  - Multiple-Read Single-Write (MRSW) modules for configuration setting
  - Parsing modules for Multipurpose Internet Mail Extensions (MIME)
  - A Remote installer based on Windows Management Instrumentation (WMI)

RESEARCH EXPERIENCE

2007 – present **Research Assistant**, University of Michigan

L_2 Kernel Classification
- Modeled weighted kernel classifiers and proposed L_2 criterion for optimizing the weights
- Derived conditions for an optimal solution to the corresponding optimization problem
- Derived concentration inequality, oracle inequality and proved the consistency of the proposed classifier in the sense of L_2 distance as well as probability of error

Robust Kernel Density Estimation
- Developed a kernel density estimator robust to outliers based on M-estimator criterion
- Proved the convergence of the kernelized iteratively re-weighted least squares algorithm
- Demonstrated the robustness through the influence function associated with the estimator
- Presented better performance when applying to anomaly detection problem

Temporal Feature Extraction and Kernel Methods for Predicting Sepsis
- Extracted temporal features from irregularly sampled time-series data
- Proposed a kernel method to handle missing features
- Demonstrated improved performance for predicting sepsis in postoperative patients

PUBLICATIONS: available for download at http://www-personal.umich.edu/~stannum

J. Kim, and C. Scott, "On the Robustness of Kernel Density M-estimators," submitted to *International Conference on Machine Learning, 2011*.

J. Kim, J. Blum, and C. Scott, "Temporal Features and Kernel Methods for Predicting Sepsis in Postoperative Patients," submitted to *Artificial Intelligence in Medicine, 2010.*

J. Kim and C. Scott, "L2 Kernel Classification," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 32, no. 10, Oct. 2010, 1822-1831.

J. Kim and C. Scott, "Performance Analysis for L2 Kernel Classification," *Neural Information Processing Systems 22 (NIPS'08).*

J. Kim and C. Scott, "Robust kernel density estimation," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Las Vegas, NV, April 2008.

J. Kim and C. Scott, "Kernel classification via integrated squared error," *IEEE Workshop on Statistical Signal Processing*, Madison, WI, August 2007.

AWARDS and HONORS

Fall 2010 KLA-Tencor fellowship

1998-2002 Undergraduate Scholarship, Seoul National University

COMPUTER SKILLS

Programming languages: C/C++, Visual C++, JAVA
Engineering/Networking tools: MATLAB

REFERENCES: available upon request