

Nesreen K. Ahmed

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Research Interests

Machine learning, data mining, statistical relational learning, sampling, mining data streams, Eigen analysis, matrix factorization, text mining/NLP, network analysis, fraud and anomaly detection, scalable data mining, high performance computing, statistical network simulation, and time series prediction.

Education

Ph.D in Computer Science, Purdue University [2008 – Present]
Research Focus: Machine Learning for Relational Data
Advisor: Jennifer Neville
GPA: 3.81/4.0, Passed All Qualifier Exams, 4th year Ph.D student

M.S. Statistics-Computer Science, Purdue University [2008-Present]

Cairo University, Egypt [2006]
M.Sc. in Information Technology
Thesis title: “A Proposed Intrusion Detection System for Encrypted Computer Networks”

Cairo University, Egypt [2001]
B.Sc. in Information Technology
GPA: 3.75/4.0, Excellent with Honors, Rank: 2nd
Graduation Project: “Design and Implementation of connected word Arabic speech recognition”

Research & Work Experience

Research Assistant, Purdue University, West Lafayette, IN Network Learning and Discovery Lab (NLD) [2008 – Present]
Advisor: Jennifer Neville

Research Assistant, Center of Excellence of Data Mining & Computer Modeling, Ministry of Communication and Info. Technology, Egypt [2005 – 2008]
Data Mining for Improving Tourism Research Group
Advisor: Amir F. Atiya

Assistant Lecturer, Cairo University, Egypt [2001 – 2008]
Faculty of Computers and Information
Courses: Neural Networks, Pattern Recognition, Information Security, Computer Networks, among others

CCNA Certified Instructor, Cairo University [2005 – 2008]
CISCO Networking Academy Program

Selected Publications

N.K. Ahmed, J. Neville, R. Kompella. *Network Sampling Designs for Relational Classification*, *Proceedings of the 6th International AAAI Conference on Weblogs and Social Media (ICWSM'12)*, Dublin, Ireland, 2012

N.K. Ahmed, J. Neville, R. Kompella. *Space-Efficient Sampling From Social Activity Streams*, 2012, Submitted

N.K. Ahmed, J. Neville, R. Kompella. *A Novel Approach for Network Sampling*. *Grace Hopper Celebration of Women in Computing (GHC)*. Portland Oregon, Nov. 2011

N.K. Ahmed, J. Neville, R. Kompella. *Reconsidering the foundations of Network Sampling*, *In Proceedings of the 2nd Workshop on Information in Networks, (WIN'2010)*, Sept. 24-25. NewYork, 2010

N.K. Ahmed, F. Berchmans, J. Neville, R. Kompella. *Time-Based Sampling of Social Network Activity Graphs*, *Proceedings of the 8th Workshop on Mining and Learning with Graphs (MLG'2010)*, 16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Washington D.C., 9 pages, 2010

N.K. Ahmed, A.F. Atiya, N. ElGayar, H. El-Shishiny. *An Empirical Comparison of Machine Learning Models for Time Series Forecasting*, *Journal of Econometric Reviews*, Vol 29, No 5-6, Special Issue on "The Link between Statistical Learning Theory and Econometrics: Applications in Economics, Finance, and Marketing", 2010

N.K. Ahmed, A.F. Atiya, N. ElGayar, H. El-Shishiny. *A Combined Neural Network/Gaussian Process Regression Time Series Forecasting System for the NN3 Competition*, *The Artificial Neural Network and Computational Intelligence Competition (NN3)* , 2007

N.K. Ahmed, A.F. Atiya, N. ElGayar, H. El-Shishiny. *Tourism Demand Forecasting Using Machine Learning Methods*, *International Journal on Artificial Intelligence and Machine Learning (AIML)*, Special Issue on "Computational Methods for the Tourism Industry", 2007

N.K. Ahmed, N. Hamdy, S.H. Ahmed. *A Proposed Intrusion Detection System for Encrypted Computer Networks*, *Proceeding of the 3rd International Conference on Informatics and Systems (INFOS)*, Cairo, Egypt, 2005

Technical Reports

N.K. Ahmed, J. Neville, R. Kompella. *Network Sampling via Edge-based Node Selection with Graph Induction*. *Technical Report TR-11-016*, Dept of Computer Science, Purdue University, 2011

Selected Research Projects

- **Towards a Better Modeling of Communication Activity Dynamics in Large-Scale Online Social Networks**
In this project, my research focus is on developing fast streaming algorithms for large graph streams.
- **Data Mining for Improving Tourism Demand in Egypt**
In this project, I have evaluated the comparative performance of eight machine-learning methods (e.g. different Neural Networks models, SVM, and Gaussian Processes) in the problem of time series

prediction. I have evaluated these methods on a large-scale datasets with 1045 time series from the M3 competition, 111 time series NN3 competition and Egyptian tourism demand datasets.

Presentations & Posters

- Network Sampling (Poster)
At the Machine Learning Summer School Poster Session, Purdue University, 2011.
- Time-Based Sampling of Social Network Activity Graphs (Talk)
At the 8th Workshop on Mining and Learning with Graphs (MLG), 16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Washington D.C., 2010
- Time-Based Sampling of Social Network Activity Graphs (Poster)
At the 8th Workshop on Mining and Learning with Graphs (MLG), 16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Washington D.C., 2010
- A Proposed Intrusion Detection System for Encrypted Computer Networks (Talk)
At the 3rd International Conference on Informatics and Systems (INFOS), 2005, Cairo, Egypt

Honors & Awards

- Graduate research assistantship, Purdue University, Computer Science (2008 -Present)
- Travel Award from Knowledge and Discovery Conf. (KDD 2010)
- Artificial Neural Network & Computational Intelligence Competition (NN3), 2007, Rank: 6th among 25 on complete dataset, 5th among 44 on reduced dataset
- Best 10 students among 200 graduates from the Faculty of Computers & Information, Cairo University, 2001
- Full Scholarship for B.Sc. in Information Technology, Cairo University (1997-2001)
- Egyptian Students Association at Purdue, Treasurer, 2009

Activities

- Member of Women in Science Program at Purdue, Indiana Center of Databases, and Statistical Machine Learning at Purdue
- External Reviewer for International Journal of Forecasting, and IEEE Neural Networks Transactions
- Volunteer webmaster and designer for workshop Mining and Learning with graphs MLG 2011, www.cs.purdue.edu/mlg2011
- Volunteer in organizing Machine Learning Summer School, Purdue 2011

Technical Skills

- Analysis of Large-Scale Datasets
Relational Datasets: Facebook, Citation and Collaboration Social Networks, Twitter, Email, IP Traffic
Time Series Datasets: M3 Competition, NN3 Competition, Egypt Actual Tourism Demand
- Computer Skills
Python, MATLAB, C/ C++, Java, HTM/DHTMLL, JavaScript, ASP, PHP, XML, WML, and WML Script, SQL, PL/SQL
- Language Skills
Fluent in spoken and written Arabic, and English
Basic Knowledge of Writing & Speaking French
Writing Skills: Creative writing, fiction, reporting, and documenting