Emaad Ahmed Manzoor

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Education

Carnegie Mellon University – H. John Heinz III College, USA **2016 –**
Ph.D., Information Systems. Advisor: Leman Akoglu.

Stony Brook University, USA **2015 – 2016**
Ph.D., Computer Science. Advisor: Leman Akoglu. (transferred)

King Abdullah University of Science and Technology, Saudi Arabia **2013 – 2015**
M.S., Computer Science. Advisor: Panos Kalnis. GPA: 3.96 / 4.0
Thesis: Scheduling Broadcasts in a Network of Timelines.

Birla Institute of Technology and Science - Pilani, India **2008 – 2012**
Bachelor of Engineering (Honors), Computer Science. GPA: 8.17 / 10.0
Co-op host: Yahoo!, Bangalore, India.

Publications & Patents

Emaad Manzoor, Sadegh M. Milajerdi, Leman Akoglu. *Fast Memory-Efficient Anomaly Detection in Streaming Heterogenous Graphs.* KDD 2016. **(research-track oral, top 70/784 submissions)**

Emaad Ahmed Manzoor, Panos Kalnis. *Method and apparatus for scheduling broadcasts in social networks.* US Provisional Application 62/118,570, filed February 2015.

Awards

- SBU Institute of Advanced Computational Science Young Writer's Award ($500). **2016**
- ACM SIGKDD Student Travel Award ($750). **2016**
- Stony Brook University Special CS Department Chair Fellowship ($8,000). **2015**
- Worldwide Top 100 (of 1720 teams), IEEE Xtreme 8.0 Programming Competition. **2015**
- Best Mashery Hack, PennApps X, Philadelphia (sponsored by Intel). **2014**
- International Travel Grant, PennApps X, Philadelphia ($500). **2014**
- King Abdullah University of Science and Technology Fellowship ($140,000)[1]. **2013**
- Erasmus Mundus LCT Masters Scholarship (EUR 40,000)[2]. **2013**
- Employee Performance Bonus, Yahoo! (INR 35,000). **2012, 2013**
- Google Teaching Scholarship, BITS - Pilani, Goa Campus (INR 16,000)[3]. **2011**
- Consultancy Development Cell Fellowship, Ministry of Science & Tech., India (INR 10,000). **2009**

Research

Predicting Purchase Behavior from Financial Sensor Logs **Aug 2016 –**
- Novel "budgeted" point process to predict temporal, categorical and real-valued outcomes.
- Quantify magnitude and pattern of causal influence between income and purchase behavior.
- Cluster customers based on income response and purchase patterns to guide income-frequency policies.

Detecting Anomalous Networks in Edge Streams **Aug 2015 – Aug 2016**
- Online clustering-based anomaly detection on graph objects with node and edge types.
- Applied to real-time detection of malicious software behavior from system call log streams.
- Project page at bit.ly/streamspot/. Code in C++ at github.com/sbustreamspot/.

Scheduling Broadcasts in a Network of Timelines **Jan 2014 – May 2015**
- Quantified/measured the impact of "monotony aversion" on attention in social network timelines.
- Designed a broadcast scheduling algorithm to maximize the attention received under competition.
- Patent filed with the USPTO, unpublished manuscript at arxiv.org/abs/1610.06052.

[1] $70,000/year for two years including tuition ($35,000), health insurance ($15,000), stipend ($20,000) and housing.
[2] Declined. Category A scholarship: EUR 20,000/year for two years. Awarded to 4 international applicants.
[3] For the undergraduate Software Development for Portable Devices course taught by Prof. Mangesh Bedekar.

Industrial Experience (Full-Time)

Yahoo!, Bangalore. Software Engineer. **Jul 2012 – Aug 2013**

- Built (team of 4) a system for streaming "trending-topic" detection from user-generated content.
- Large impact within the company, improved over previous trend-detection latency by 600%.
- Implemented with Apache Storm, Kafka, HBase and Java.

Industrial Experience (Intern)

Quantitative Engineering Design, San Francisco (remote). Research Intern. **Summer 2015**

Advised by cofounders William Wu (Ph.D., EE, Stanford) and Jiehua Chen (Ph.D., Statistics, Stanford).

- Designed and developed an online variant of a Bayesian model to predict financial fraud.
- Developed a reference implementation of Mondrian Forests (online random forests).
- Designed a distributed system architecture to enable online training of a classifier ensemble.

Oregon State University, Corvallis (remote). Google Summer of Code Intern. **Summer 2014**

- Designed and developed a REST service to enable IPMI operations over HTTP.
- Designed and developed an extensible, hierarchical CLI that delegates to the REST service.
- Design and implementation discussed at eyeshalfclosed.com/tags/#gsoc2014-ref.

Tachyon Technologies, Bangalore. Research Intern. **Summer 2012**

Advised by cofounder and MIT TR35 awardee Ram Prakash Hanumanthappa.

- Developed a fast, simple and effective algorithm to de-warp photographs of flat book pages.
- Implemented an algorithm from the low-level vision literature to flatten color gradients.
- Applied algorithms to transform photos of comic book pages into web-ready digital comic panels.
- Packaged into an Android app interfacing with my code in MATLAB over a Python HTTP bridge.

Yahoo!, Bangalore. Software Engineer Intern. **Fall 2011**

- Extended the "trending-topic" detection system to be centrally configurable and multi-threaded.
- Implemented a research prototype to detect geographically and demographically niche events.
- Offered and accepted a full-time position (top 3/14 interns from BITS – Pilani University).

University of Massachusetts, Lowell (remote). MVHub Summer of Code Intern. **Summer 2011**

- Built a Debian package for MVHub, a directory of non-profit services.
- Wrote Perl scripts to automate building and updating the Debian package.
- Wrote a Launchpad recipe and set up a PPA to conveniently host and install the package from.

Teaching

- Programming Languages and Compiler Design. Course project design and grading. **Spring 2012**
- MIT Indian Mobile Initiative. Android development lab sessions and tutoring. **Summer 2011**
- Software Development for Portable Devices. Courseware at bit.ly/emaadcourseware. **Spring 2011**

Service

- External reviewer for SocInfo, WWW, EuroSys, VLDBJ, CIKM.
- Organized TechFM, a weekly technical talk series at Yahoo! on math, science and technology.
- Frequent participant at Random Hacks of Kindness.

Languages

- Analysis: Python (preferred), Julia (beginner)
- Performance: C++ (preferred), Java (for distributed systems)

Selected Talks

All slides available at speakerdeck.com/emaadmanzoor. Videos available at eyeshalfclosed.com/talks/.

- *Fast Memory-efficient Anomaly Detection in Streaming Heterogenous Graphs.*
  - ACM SIGKDD Conference (research-track oral presentation). **Aug 2016**
  - CMU Database Group Seminar (hosted by Christos Faloutsos). **Oct 2016**
  - RSA Laboratories (hosted by Zhou Li and Kevin Bowers). **Nov 2016**
  - CMU Statistical Networks Seminar (hosted by Cosma Shalizi). **Nov 2016**
- *Scheduling Broadcasts in a Network of Timelines.* Masters Thesis Defense, KAUST. **May 2015**
- *Time-Inconsistent Planning.* InfoCloud Research Group Seminar, KAUST. **May 2014**
- *Reviving Failed Classifiers with Random Forests.* Tech talk at Yahoo!. **May 2013**
- *Building a Linux cluster with Beanstalkd.* Tutorial at PyCon India. **Sep 2012**

Selected Graduate Coursework

All completed courses listed were awarded grades A- or higher. Fall 2016 courses are ongoing. Spring 2017 courses are upcoming.

Economics

- Introduction to Econometric Theory (Edson Severnini, CMU) **Spring 2017**
- Microeconomics (Brian Kovak, CMU) **Fall 2016**

Statistics

- Statistical Machine Learning (Larry Wasserman & Ryan Tibshirani, CMU) **Spring 2017**
- Advanced Probability Overview (a.k.a. Measure Theory) (Jing Lei, CMU) **Spring 2017**
- Intermediate Statistics (Larry Wasserman, CMU) **Fall 2016**

Computer Science

- Operating Systems (Michael Ferdman, Stony Brook University) **Fall 2015**
- Theory of Database Systems (Fusheng Wang, Stony Brook University) **Fall 2015**
- Artificial Intelligence (I.V. Ramakrishnan, Stony Brook University) **Fall 2015**
- Computational Complexity (Antoine Vigneron, KAUST) **Fall 2014**
- Probability and Random Processes (Mohammed-Slim Alouini, KAUST) **Fall 2014**
- Machine Learning (Xiangliang Zhang, KAUST) **Spring 2013**
- Advanced Topics in Data Management (Panos Kalnis, KAUST) **Spring 2013**
- Data Analytics (Xin Gao, KAUST) **Fall 2013**
- Computing Systems and Concurrency (Hany Ramadan, KAUST) **Fall 2013**
- Design and Analysis of Algorithms (Mikhael Moshkov, KAUST) **Fall 2013**