

JAYANT GUPCHUP

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EDUCATION

Johns Hopkins University

Ph.D. in Computer Science, Candidate

Dissertation: Data Management of Environmental Monitoring Sensor Networks

Advisors: Prof. Alex Szalay and Prof. Andreas Terzis

Baltimore, MD

Expected: Jan 2012

M.S. in Applied Mathematics and Statistics, GPA: 3.67

Thesis: Classification-Based Event Detection in Environmental Networks

May 2011

M.S. in Computer Science, GPA: 3.75

Dec 2007

Mumbai University, Veermata Jijabai Technological Institute (VJTI)

B.E. in Computer Engineering, Top 10% of class

Thesis: Data Mining and Indexing of Astronomy Databases

Mumbai, India

Jun 2003

RELEVANT COURSEWORK

Computer Science:

Algorithms, Parallel Programming, Transaction Systems,
Information Retrieval, Natural Language Processing

Applied Statistics and Mathematics:

Data Mining, Statistics, Time Series Analysis,
Linear Optimization, Matrix Analysis

SKILLS

Programming: Java, C#, C, C++, Perl, Transact-SQL, JavaScript

Software: MATLAB, Excel/VBA, ArcGIS

Environments: Hadoop, Amazon Elastic Map Reduce

Data Analysis: Robust and Streaming Principal Component Analysis (PCA), Robust Regression (LLSE),
Classifiers for Categorical & Numeric Data, Expectation Maximization (EM), Hierarchical
Clustering, Hidden Markov Models (HMM)

PROFESSIONAL EXPERIENCE

Johns Hopkins University

Research Assistant, eScience & Sensor Networks Group

Baltimore, MD

Aug 2007 - present

- **Timestamping algorithms:** Developed two energy-efficient algorithms to assign timestamps to sensor measurements. Developed in Java.
 - Resulted in 10% increase in data yield and enabled networks to operate unattended for months.
 - Implemented a sensor network simulator to understand scalability of the solution.
- **Environmental data management:** Designed and implemented a multi-stage end-to-end data processing pipeline for sensor data streams in Transact-SQL and C#
 - Current Size: 100 Million+ records.
- **Analytics of network logs:** Analyzed and improved the performance of a wireless sensor network based on network logs
 - Identified failures causes, metrics and performed statistical analysis to predict failures of components.
- **Sensor data visualization:** Designed a system to visualize real-time, multi-resolution environmental data collected by the JHU soil sensor network.
 - Used by the LifeUnderYourFeet soil-ecology group at the Johns Hopkins University.
 - Mentored two masters and two undergraduate students.
- **Data-driven data collection:** Improving the data collection system by exploring the tradeoff between communication costs and fidelity using robust statistical methods.
 - Developed an incremental and robust principal component analysis (PCA) library in MATLAB.

PROFESSIONAL EXPERIENCE (CONTINUED)

Microsoft Research

San Francisco, CA

Research Intern, Scalable Servers & eScience Group

Jun 2007 – Aug 2007

- **Matlab access to DataCube:** Implemented a data adapter and MDX query builder in MATLAB to access data from a remote SQL Analysis Server.
 - Used by the AmeriFlux scientific collaboration.

Inter-University Centre for Astronomy and Astrophysics

Pune, India

Project Officer, Virtual Observatory Project

Jun 2003 – Aug 2005

- **Telescope data archiving:** Part of a team of five that designed an archival system for data generated from optical telescopes. Developed in Java
- **Data exploration of astronomy surveys:** Employed SQL query plans to retrieve data for analytics of the Sloan Digital Sky Survey database (~ Tb)

SELECTED PUBLICATIONS AND TALKS

- J. Gupchup, D. Carlson, R. Musaloiu-E, A. Szalay, A. Terzis. Phoenix: An Epidemic Approach to Time Reconstruction, 7th European Conference on Wireless Sensor Networks, 2010, Portugal. **Oral presentation.**
- J. Gupchup, R. Musaloiu-E, A. Szalay, A. Terzis. Sundial: Using Sunlight to Reconstruct Global Timestamps, 6th European Conference on Wireless Sensor Networks, 2009, Ireland. **Oral presentation.**
- J. Gupchup, R. Musaloiu-E, M. Chang, A. Szalay, K. Szlavetz, A. Terzis. Deploying Advanced Wireless Sensor Networks for Ecological Monitoring, Microsoft eScience Workshop 2008. **Oral presentation.**
- J. Gupchup, C. V. Ingen. Enabling Eco-Science Analysis with Matlab and DataCubes in the Cloud, Microsoft Technical Report, 2008.

VOLUNTEER EXPERIENCE

Harvard Humanitarian Initiative

Developer, Haiti Voices

Jan 2010 – July 2010

- **Data management portal for Haiti relief:** Developed a data entry and search portal using Google visualization API to provide real-time information to non-profit organizations working in Haiti.

INTERESTS

Data visualization, Guitar playing

REFERENCES

Prof. Alex Szalay

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Prof. Carey Priebe

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Dr. Catharine Van Ingen

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