Arun Kiran Aryasomayajula

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EXPERIENCE

Geisinger Health System, Institute of Advanced Applications, Danville, PA
(http://www.geisinger.org/iaa/index.html)

High Performance Computing/ Data Engineer, December 2013- present

- ✓ Developed a data quality and consequence of errors tracking system for data imputation and cleaning operations using first principles. The tool is written as a Python library and can be plug-n-played into other applications.
- ✓ Developed a medication adherence index which uses transient prescription fill/refill data, clinical variables and created regression models relating the index with Census data and geographic location to draw insights. Paper submitted and accepted for AMIA and INFORMS healthcare conferences.
- ✓ Developed and deployed an outpatient scheduling system using Java, PostgreSQL9.5 and CPLEX optimization engine for maximizing revenue hospital wide.
- ✓ Developed a Gaussian Processes Model based prediction tool for OR-scheduling for cRNA and Anesthesiologist compatibility for best patient outcomes in surgery in matlab.
- ✓ Designed and deployed a custom Nearest Neighbors and Gaussian process model based tool for identifying and rejecting prescribed labs for patients with arbitrary confidence in matlab and R. The tool is operational and has saved ~$1.5 million in savings on prescribed labs+manhours.
- ✓ Deployed Hadoop 2.0 (YARN), Apache Storm and Spark products on IAA's HPC cluster. Involved in designing map-reduce jobs for analytical workflows for clinical/operational analytics.

Optimal Solutions Inc., Bridgewater, New Jersey, USA (**www.osiopt.com**)

Operations Research Analyst I, September 2012 – November 2013.

- ✓ Designed Hadoop/Map-Reduce based analytics platform for online/offline data for travel time prediction using k-means clustering, Support Vector Regression and data cleansing.
- ✓ Developed data acquisition programs leveraging RESTful services to receive JSON data from Google Maps, Bing Traffic API and Forecast.io and created document datastores in MongoDB for the same.
- ✓ Created HBase datastore for semi-structured column based data from TxDoT

archives.

- ✓ Deployed Linux and MS Windows server 2012 HPC clusters on Amazon's EC-2 cloud for benchmarking and testing parallel Mixed Integer Program models and running mapreduce jobs for data analytics.
- ✓ Principal Investigator for NSF STTR Phase I proposal with Rutgers University titled: Using Big Data to Support Supply Chain Analytics and Optimization.

- ✓ Developed a Transportation Optimization Demo model using Gurobi .Net API and ASP.Net hosted on IIS Web Server on Amazon's EC2 cloud instance (http://ec2-54-224-45-165.compute-1.amazonaws.com/TransportDemo/Default.aspx) resulting in OSI becoming a consulting partner for Gurobi Optimization Inc. (www.gurobi.com)
- ✓ Developed a Cruise Recommender tool for a major Cruise Liner in Java, CPLEX Concert technology and IBM ODM Enterprise.
- ✓ Implemented full sales lifecycle for IBM Optimization and SCM products like CPLEX Optimization studio and LogicNet Plus XE.
- ✓ Developed a Natural History Model and Treatment Models using Markov chains in VBA and MS Access for a reputed pharmaceutical company.
- ✓ Developed Constraint Programming (CP), Linear Programming (LP) and Mixed Integer Programming (MIP) models in OPL w/ CPLEX solvers.
- ✓ Helped writing DoE and NSF SBIR grant proposals for energy efficiency and operations optimization for supply chain and manufacturing operations.

WS Atkins plc, Bangalore, Karnataka, India (http://www.atkinsglobal.com/)

Graduate Engineer, June 2007 – July 2008

- ✓ Worked on developing numerical hydraulic and hydrologic models of sewer networks using GIS software like MapInfo and Info-Works suite.
- ✓ Lead a team of 5 hydraulic modelers for the PR-09 "Growth Studies" project which involved simulations of hydraulic structures in 65 cities of UK for assessment of impact due to population growth.

Tata Consultancy Services, Hyderabad, Andhra Pradesh, India (http://www.tcs.com/)

Assistant Systems Engineer, April 2006 – June 2007

- ✓ Programmed expert error handling block for the APZ-Blade Cluster operating system.
- ✓ Programmed data structures like doubly linked lists and binary trees in C and Plex-C.
- ✓ Worked on unit testing and maintenance of some older versions.

SKILLS

- ✓ Programming: Java, R, SQL, MATLAB, Python
- ✓ Languages: English, Telugu, Hindi

- ✓ OS: Linux, Windows 7, Windows Server 2012 (w/ HPC pack)
- ✓ S/W tools: K N I M E , HDP 2.3, Hive, Pig, Mahout, MongoDB, AWS-SDK for Java, CPLEX Concert technology, Gurobi Solver with Java and .Net APIs, Google OR Tools, Ant, Maven, Teradata, IBM CPLEX Optimization Studio, IBM ODM Enterprise, IBM-ILOG SCM suite, Tableau.
- ✓ Other: Distributed Computing, Machine Learning (Neural Networks, Random Forests, Support Vector Machines, Clustering), Large Datasets, Heuristics, Linear and Mixed Integer Programming, genetic algorithms, swarm optimization algorithms, Monte Carlo Methods, Statistics.

EDUCATION

Texas A&M University, College Station,

Texas *Master of Science in Physics*, August

2012 Cumulative GPR: 3.63

- ✓ Worked with Cryogenic Dark Matter Search (CDMS- http://cdms.berkeley.edu/) data analysis group. Implemented principle component analysis (PCA), artificial neural networks (ANNs), multivariable chi square tests and information theoretical methods to discriminate between signal and background for multiple datasets of >50 million data-points and >20 parameters. Identifying various machine learning algorithms to be used in the context of identifying different species of particles through data observed in the cryogenic detectors made for Dark Matter detection.
- ✓ Created web services for CDMS data which involved creating relational databases, querying data using t-SQL, created java classes for managing secure database connections using JDBC and services using JavaScript, JSON and JSPs.
- ✓ Worked on thin film deposition on germanium and silicon substrate and PCB fabrication for semiconductor based cryogenic dark matter detectors for the CDMS collaboration.

Master of Engineering in Civil Engineering, December

2009 Cumulative GPR: 3.40

- ✓ Developed Hybrid Genetic algorithm + Ant colony algorithm for optimizing ice roads routes for oil and gas exploration in Alaska. This required a non-dominated sorting and genetic algorithm guided ant colony algorithm which optimized a multi-objective problem. (http://nsdss.ine.uaf.edu/)
- ✓ Used ARMA and ARIMA time series analysis and wavelets to predict the trends of the annual flow in Brazos River in the last five decades.

College of Engineering, Andhra University, India

Bachelor of Engineering in Civil & Environmental Engineering, April

2006 Cumulative GPR: 77%

- ✓ Studied the effects of extended aeration (continuous and bubble) on the pH, BoD and CoD of the raw effluent from a soft-drink bottling plant. Made recommendations on reducing the use of conc. HCL for neutralization which resulted in a RoI of 23% on raw materials.

PUBLICATIONS

- ✓ Dark Matter Search Results Using the Silicon Detectors of CDMS II-CDMS Collaboration (2013), http://arxiv.org/abs/1304.4279
- ✓ Silicon Detector Results from the First Five-Tower Run of CDMS II- CDMS Collaboration (2013), http://arxiv.org/abs/1304.3706.
- ✓ Multi-Objective Planning for Ice Road Routes on Alaska's North Slope: Algorithms and Technology Development - Kelly Brumbelow1; Arun K. Aryasomayaula2; Stephen F. Bourne3; and Amy C. Tidwell4 http://dx.doi.org/10.1061/41114(371)278
- ✓ Brumbelow, K., A.C. Tidwell, S.F. Bourne, W.F. Schnabel, J. Haleblian, and A.K. Aryasomayajula*. 2010. North Slope Decision Support System: Water resources management in support of oil and gas exploration in Alaska. Proc. of AWRA 2010 Spring Specialty Conference:GIS&WaterResources,AWRA. http://www.awra.org/meetings/Florida2010/abs/Sess%2026%20abs.pdf

PROFESSIONAL ORGANIZATIONS & ACTIVITIES

- ✓ American Physical Society, Student Member, January 2010 – August 2012
- ✓ Society of Industrial and Applied Mathematics, Student Member, January 2009-August 2012
- ✓ INFORMS – Member, Jan'2013- present.

HONORS

- ✓ $1000 Department of Physics & Astronomy Scholarship, January 2010
- ✓ $2000 Zachry Department of Civil Engineering Scholarship, January 2009
- ✓ Nationally ranked 7/15000 in Graduate Aptitude Test in Engineering (GATE) 2005

CERTIFICATIONS

- ✓ IBM Optimization Supply Chain Management Technical Professional
- ✓ IBM Optimization Supply Chain Management Sales Professional
- ✓ IBM Optimization Sales Professional
- ✓ IBM Optimization Technical Professional
- ✓ IBM trained GPFS Administrator

WORK AUTHORIZATION/VISA

- ✓ H1-B specialty worker visa. Can work for any employer with sponsorship.