Masood Krohy

Lead Data Scientist (Big Data | Deep Learning)

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Summary

Hi there, I am Masood Krohy (Khosroshahy). Big Data Analytics, including AI / Machine Learning / Deep Learning, is extremely fascinating and I find it very rewarding to take up new hard technical challenges in this field and deliver operationalized solutions typically in short order. I have the scientific background to design mathematical algorithms and the software development expertise to turn those algorithms into scalable, production-quality code on the Hadoop and Spark platforms. I have more than 6 years of experience in Data Scientist tasks obtained during the past 4 roles, spanning several industries:

– CN (transportation): built an AI-powered product to detect defective railroad components
– Intact (insurance): driving behavior detection from the 80-billion-datapoint telematics data as well as working on the optimization of their Hadoop/Spark platform
– Rogers (telecom): network performance benchmarking using multi-terabyte telecom data
– Concordia (academia/computer security): analytical modeling during Ph.D. work

Here are few more things about my technical profile:

• Experience working with relational databases through my recent work with Postgres/PostGIS, through work on SwissQual's SQL Server-based NQDI database, and with Joomla's MySQL database in the context of several web development projects
• Expertise in Machine Learning and Data Mining (implemented a large number of algorithms)
• Equivalent to 6 years of full-time experience in software development (inc. Python, SQL, Java and C++)
• Authored/Co-authored several peer-reviewed papers: 2 ISI journal papers and 6 conference papers
• Certified Associate in Project Management (PMI's CAPM certificate 2012-2017)
• Excellent communication skills with full proficiency in English and French (multiple certificates)

Experience

Lead Data Scientist at CN

April 2017 - October 2017 (7 months)

– Member of Operational Technology Data Services (OTDS) team
– Designed and built an AI-powered product: automatic, Deep Learning-based, recognition of defective railroad components from images taken by specialized test trains. Two complex, ConvNet/TensorFlow models working in tandem (object within object detection)
– Proposed solution architectures for enriching geospatial data (EFDM project)

Data Scientist at Intact Financial Corporation

May 2015 - March 2017 (1 year 11 months)

– Member of Intact Lab R&D team
– Working on the firm's usage-based insurance (UBI) project, involving telematics data analytics (80 billion records/year)
– Utilizing Postgres/PostGIS and several components from the Hadoop/Spark ecosystems

Technical Highlights:
– Architected, implemented, and operationalized a Big Data Mining application on Hadoop (pattern recognition in telematics data)
– Geospatial filtering and analysis of Big Data, implemented using Hive UDFs
– Designed and deployed a distributed, TensorFlow-based infrastructure to enable Deep Learning on Big Data projects
– Designed several Deep Learning models using TensorFlow to pump more intelligence into Intact's telematics program

Management and Coaching:
– Transformed business requirements from the telematics/R&D directors to technical solutions
– Helped the project managers with scoping & tasks assignment during the implementations
– Coached IT specialists during delegation of some operationalized/implemented solutions
– Advised C/D-level executives during several RFI processes with IT/infrastructure vendors
– Organized and delivered an Advanced Data Analytics training to 20+ analysts, senior analysts, and directors in the company (data mining/machine learning with Python/Hive/Spark)

Senior Analyst at Rogers Communications

August 2013 - August 2014 (1 year 1 month)

– Member of OSS Benchmarking team / Service Quality Assurance program
– Refined the multi-carrier wireless network drive testing (benchmarking) program

Technical Highlights:
– Developed a reporting/analytics system to gain insights from multi-terabyte SQL databases
– Used R to run statistical tests on benchmarking data collected from the 3 main cellular network operators in order to identify trends, support marketing claims, etc.
– Conducted root cause analysis of network events to help optimize Rogers' UMTS/LTE networks: voice call drops, coverage issues, low data throughput on LTE/HSPA networks, etc.
– Developed expertise of SwissQual's NQDI, NQWeb, NQView & Diversity Benchmarker

Management and Coaching:
– Transformed business requirements from OSS Benchmarking manager to technical solutions
– Remotely worked with and monitored a national team for data collection (drive tests)

– Provided expert opinion to the legal department in defending Rogers' marketing claims during occasional arbitration processes with its competitors
– Coached marketing executives on how to best utilize the network performance results to craft new marketing messages to the consumers in the Canadian market
– Created various charts/graphs to highlight and communicate potential improvements to the performance of the cellular network to the executives

Ph.D. Candidate at Concordia University

January 2010 - April 2013 (3 years 4 months)

– Developed several Continuous-Time Markov Chain (CTMC) models to predict and estimate botnet size (a Predictive Analytics type analysis using probability theory concepts)
– Wrote numerous scripts in Mathematica and Matlab for computing and analyzing the data
– Compared the results predicted by the developed analytical models with botnet measurement results reported by the Internet security industry (Damballa corporation's data)
– Analyzed the 4G cellular networks and determined a vulnerability in the LTE air interface
– Customized LTE-Sim, a C++-based 4G/LTE simulator, to conduct a simulation to determine the number of botnet nodes needed for a DDoS attack against the cellular network
– PhD Thesis containing analysis and data visualizations: www.masoodkh.com/PhD

High-level experience obtained:
– Gained a great insight into network security issues affecting communication networks
– Developed the capacity to devise solutions to predict and mitigate network security threats
– Enhanced project and time management skills while working on the phases of the project

Produced publications:
– "SComF and SComI Botnet Models: The Cases of Initial Unhindered Botnet Expansion", 25th Annual Canadian Conference on Electrical and Computer Engineering (CCECE12), April 29-May 2, 2012, Montreal, Canada, DOI: 10.1109/CCECE.2012.6334871
– "The SIC Botnet Lifecycle Model: A Step Beyond Traditional Epidemiological Models", Computer Networks (Elsevier), Special Issue on Botnet Activity: Analysis, Detection and Shutdown, Volume 57 (2013), Issue 2, pp. 404–421, DOI: 10.1016/j.comnet.2012.07.020
– "Botnets in 4G Cellular Networks: Platforms to Launch DDoS Attacks Against the Air Interface", 2013 International Conference on Selected Topics in Mobile and Wireless Networking (MoWNeT), 19-21 August 2013, Montréal, Canada.

Researcher/Programmer at Concordia University

September 2009 - December 2009 (4 months)

– Designed and developed a presence-based messaging application in Java (NetBeans IDE)
– Developed a graphical user interface for the client software using the IDE tools
– Project conducted as part of a Ph.D. program course

Lab Instructor/Researcher at ÉCOLE POLYTECHNIQUE DE MONTRÉAL

September 2007 - June 2009 (1 year 10 months)

– Served as lab instructor and teaching assistant for the course “Data transmission and digital communication networks” (ele4704)

– Conducted experiments with network equipments and supervised students’ experiments

– Graded assignments and conducted exercise sessions for computer network problems

– Worked on a research project regarding the problems of P2P traffic in the access network reported by Bell Canada engineers

– Using the Eclipse IDE, customized and programmed in NS-2, a C++/TCL-based network simulator, to conduct a simulation studying the P2P traffic

–Wrote numerous scripts in Python for parsing, computing and graphing the data/trace files

– Proposed a model to help with the P2P traffic problems and presented it in the following paper: “UARA in Edge Routers: An Effective Approach to User Fairness and Traffic Shaping”, International Journal of Communication Systems (Wiley), 25: 169–184. DOI: 10.1002/dac.1262

Intern

July 2006 - January 2007 (7 months)

– Designed the architecture and determined the necessary parameters of an IEEE 802.11 physical layer and propagation models in a prototype event-based network simulator

– Implemented the designed architecture using C++ in the network simulator

– Documented the project results for integration in the NS-3 network simulator project

– Gained experience in working with and integrating various telecom C++ libraries

– Project conducted for the M.Sc. thesis

Researcher/Programmer at Télécom ParisTech

January 2006 - June 2006 (6 months)

– Modeled Session Initiation Protocol (SIP) and Routing Information Protocol (RIP) using UML in Rhapsody (inc. partial C++ implementation of the protocol logic for code generation)

– Investigated IP Multimedia Subsystem (IMS), and its application servers, for advanced telecom service delivery; the prepared report on IMS helped with the securing of a grant from a major telecom company

– Projects carried out as part of the M.Sc. program

Researcher/Programmer at Iran University of Science and Technology

February 2004 - September 2004 (8 months)

– Implemented the Session Initiation Protocol (SIP) in the J-Sim network simulator

– Investigated the feasibility of using SIP, SDP, and T.38 protocols for real-time fax transmission on the Internet (Fax over Internet Protocol – FoIP)

– Conducted for the B.Sc. final project

– Presented the results in the following paper: “Utilizing DiffServ and SIP Contact Header for

Real-time Fax Traffic Engineering", 18th Annual Canadian Conference on Electrical and Computer Engineering (CCECE05), May 1-4, 2005, Saskatoon, Saskatchewan, Canada

Researcher/Programmer at Iran University of Science and Technology
October 2003 - January 2004 (4 months)

– Analyzed the performance of antenna structures using the HP HFSS software
– Supervised the construction of the antenna having the optimal performance
– Helped with the documentation of the results in three conference papers
– Project carried out as an extension of the work done during Antenna lab in the B.Sc. program

Intern
July 2003 - September 2003 (3 months)

– Developed a simulator in C++ for a novel approach in matrix inversion calculation
– Internship done as part of the B.Sc. program

Education

Concordia University
Ph.D., Electrical and Computer Engineering (Computer and Telecom Networks), 2013
Télécom ParisTech (ENST)
M.Sc., Networked Computer Systems, 2007
Iran University of Science and Technology
B.Sc., Electrical Eng. - Telecommunications, 2004

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Contact Masood on LinkedIn