ARMAN AKBARIAN, PH.D.

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PROFESSIONAL EXPERIENCE

Data Scientist — *Qi-Leap Analytics Inc.* 2016-2016

○ Developed the core recommender engine (collaborative filtering: user-user, item-item and NNMF) for company's data collecting platform, and built simplified APIs for the library for further usability by the engineering team.

○ Optimized the recommender engine to scale up-to $\sim 100K \times 100K$ user-item utility matrix and provided the guidelines for the company for future use of the library for further scaling on a distributed platform.

○ Performed a series of experiments using publicly available transaction/purchase data ($300M$ consumer purchase transaction) and showed that the collaborative filtering has significant ($\sim$ up-to 300% improvement in top10 precision) personalization over baselines (non-personalized recommender based on item popularity).

○ Helped the engineering and app dev team in integrating the recommender engine into the data pipeline and deploying it on a GCE instance on Google Cloud.

Machine Learning Consultant — *Freelance consultant* 2015-2016

○ Consulted 2 early stage startups in Vancouver with data products, including design of statistical analysis dashboard, experimental design and hypothesis testing, visualization and consumer segmentation.

○ Built several machine learning pipelines in NLP, predictive analytics and forecasting using publicly available data provided by companies for Kaggle competitions (see below).

R&D in Large Scale Computing & Analytics (M.Sc., Ph.D.) — *University of British Columbia*, 2008-2015

○ Established the first successful numerical method for critical phenomena by solving the Einstein's GR system in a fully evolutionary scheme. The method extends the research in numerical relativity toward new discoveries.

○ Resolved a debate (since 1998) in phase transition of collapsing galaxies using computational methods.

○ Developed *FD: Finite Difference Toolkit*—an open-source high-level markup language for solving PDEs, see below.

○ Developed parallel and optimized scientific computing codes to speed-up computations by factors of 100-1000x, and performed several large scale simulations (order of million CPUxHour).

○ Analyzed scientific results using statistical methods and visualization tools. Collaborated in presentation and publication of results in peer-reviewed journals (2 American Physics Society, *Phys. Rev. D.* publications).

TECHNICAL EXPERTISE & SKILLS

Skills: statistical modeling and inference (Bayesian & frequentist), regression, hypothesis testing, Monte Carlo simulations, classification (logistic reg., neural networks, SVM, decision trees), text mining, natural language processing, clustering, recommendation systems.

Languages and Tools: Python, R, SQL, C/C++, Matlab, Maple, shell scripting (Perl, Bash), familiar with data-intensive frameworks (Hadoop, MapReduce), Google Cloud, MPI & OpenACC parallel computing API's, git.

SELECTED PROJECTS IN DATA SCIENCE — OPEN SOURCE SOFTWARE DEVELOPMENT

HomeDepot Product Search Relevance, (NLP & Text Mining, Kaggle Data Science Challenge, Top 3.5%)

○ Analyzed 200K+ documents (product description) and built a machine learning pipeline to score the relevance of customers' search queries to the products. Using several NLP and text mining techniques combined with gradient boosted regression trees and ensembling, achieved a far better accuracy (60% improvement in RMSE toward the top benchmark, i.e. human rating of relevance) than standard techniques in text relevance—*tf-idf* algorithm for instance—(Python Code, https://github.com/rmanak/search_relevance)

FD: Finite Difference Simulations Toolkit

○ Designed a high-level programming language to pose, test and solve complex sets of PDEs using finite difference techniques on computer clusters (C, Maple and FORTRAN Code, with MPI interface for parallelization). Software homepage: http://rmanak.github.io/FD

EDUCATION

Data Science Specialization — *Johns Hopkins University*, 07/2015–01/2016
PhD, Physics (Numerical Relativity, Computational Physics), — *University of British Columbia*, 2015
MSc, Computational Physics, — *University of British Columbia*, 2010
BSc, (double major), Mathematics & Physics, — *Sharif University of Technology*, 2008

HONORS & AWARDS

Gold Medal, 34th *International Physics Olympiad*, — Taiwan (2003)
FYF Doctoral Fellowship, Faculty of Science Award, Physics Grad. Scholarship, — UBC (2010, 2009, 2008)