Roozbeh Ketabi

Computer and Information Science and Engineering
Herbert Wertheim College of Engineering
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RESEARCH
INTERESTS

◇ Mobility Modeling, Vehicular Mobility, Smart Cities and Transportation

◇ Computer Simulation, Scenario Generation, Trace Generation and Generative Modeling

◇ Data Science and Applied Machine Learning, Deep Learning for Mobility Modeling

◇ Vehicular and Mobile Adhoc Computing/Networking, Connected Vehicles

EDUCATION

Ph.D. in Computer Science — Aug. 2020
CISE, University of Florida, Gainesville, Florida — GPA: 3.94/4.00
Written Qualification Exams passed — 2015
Oral Qualification Exam passed and Candidacy Achieved — 2018
Dissertation: Enabling Urban-Scale Simulation, Similarity, Matching and Forecasting Applications Using Spatio-Temporal Analysis of Vehicular Mobility
ADVISOR: Dr. Ahmed Helmy

M.Sc. in Computer Science — May 2019
CISE, University of Florida, Gainesville, Florida — GPA: 3.94/4.00

B.Sc. in Information Technology Engineering — July 2013
Department of Computer Engineering — GPA: 17.26/20.00
Sharif University of Technology, Tehran, Iran
Project: Android App for video content delivery/streaming
SUPERVISOR: Dr. Abbas Heydarnoori

PUBLICATIONS

◇ Buildings' Density Data Distributions and Ensemble Prediction Models Architecture: Seasonal and Deep Learning
Al-Qathrady, M., **Ketabi, R.**,& Helmy, A. IEEE TNSM special issue on Data Analytics and Machine Learning for Network and Service Management 2020. [Final Preparations]

◇ On Spatio-Temporal Similarity of Trips, and its Applications
Ketabi, R., Alipour, B., & Helmy, A. ACM TSAS 2020. [Under Revision]

◇ Vehicular Traffic Density Forecasting through *the Eyes of Traffic Cameras*; a Spatio-Temporal Machine Learning Study.
Ketabi, R., Al-Qathrady, M., Alipour, B., & Helmy, A. ACM DIVANet 2019.

◇ Where Are You Going Next? A Practical Multi-dimensional Look at Mobility Prediction
Alipour, B., Tonetto, L., **Ketabi, R.**, Ding, A. Y., Ott, J., & Helmy, A . ACM MSWiM 2019.

[PREPRINT] Practical Prediction of Human Movements Across Device Types and Spatiotemporal Granularities. arXiv:1903.00951.

◇ *Playing with Matches*: Vehicular Mobility through Analysis of Trip Similarity and Matching.
Ketabi, R., Alipour, B., & Helmy, A. ACM SIGSPATIAL 2018.
[EXTENDED PAPER] arXiv:1809.02298
Poster presented at UF Informatics Institute's Annual Symposium 2018.

◇ *Flutes vs. cellos*: Analyzing mobility-traffic correlations in large wlan traces. Alipour, B., Tonetto, L., Ding, A. Y., **Ketabi, R.**, Ott, J., & Helmy, A. IEEE INFOCOM 2018.

[EXTENDED PAPER] Analyzing Mobility-Traffic Correlations in Large WLAN Traces: Flutes vs. Cellos. arXiv:1801.02705

◇ *En route:* Towards Vehicular Mobility Scenario Generation at Scale.
Ketabi, R., Alipour, B., & Helmy, A. IEEE INFOCOM SmartCities 2017.

Poster abstract: En route towards trace-based simulation of vehicular mobility.
Ketabi, R., Alipour, B., & Helmy, A. IEEE INFOCOM 2017 [**Best Poster Award**]

◇ A Study of Diffusivity in Concert Halls Using Large Scale Acoustic Wave-Based Modeling and Simulation
Azad, H., **Ketabi, R.**, Siebein, G., Inter-Noise 2018.

◇ Enabling a circular economy in the built environment sector through blockchain technology.
Shojaei, A., **Ketabi, R.**, Hakim, H., Wang, J. Journal of Cleaner Production, Volume 294, 2021.

HONORS AND AWARDS	
◇ **UF Office of Research Travel Award**	2019

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To attend and present my research at ACM MSWIM/DIVANET conference.

◇ **UF Informatics Institute Fellowship Award**   2018-2019
Awarded to select PhD candidates in interdisciplinary information research ($16.5k value).

◇ **Best Poster Award**   2017
For our *En Route* work presented at IEEE Infocom 2017.
Related published article received all 5/5 reviews.

◇ **2nd place in Microsoft Coding Competition**   2015
Held at UF Campus. Team of three.

◇ **University of Florida Graduate School Fellowship Award**   2013
Recipient of the prestigious fellowship award (value of $150K) in support of graduate studies.

◇ **Elected Vice President of Iranian Student Association**   2014 - 2015
Elected in a landslide victory for the Vice President of Iranian Students Association; a University of Florida Student Government funded cultural organization.

◇ **Ranked 3rd in Information Technology**   2009 - 2013
By Cumulative GPA in Computer Engineering - Information Technology class of 2013.

◇ **Ranked among top 0.01% nationwide university applicants**   2009
Placed 256th out of 300K applicants which allowed admission into the most prestigious engineering school of the country.

PEDAGOGICAL EXPERIENCES

◇ Instructor of COP3275: Programming using C   UF — FA 2018, SP 2019, FA 2019
Holding the lectures and [re]designing the curriculum.

◇ Teaching TA in CDA3101: Introduction to Computer Organization   UF — SU 2019
Holding discussion lectures and assistance in design of quizzes, exams and ARM assembly projects in addition to student evaluation.

◇ TA in CNT4007C and CNT5106C: Computer Networks   UF — SP 2014, FA 2017, SP 2018
Assisted with grading and the semester-long project for both undergraduate and graduate sections.

◇ Course Assistant in Computer Networks Sharif — FA 2012, SP 2013
Design and implementation as proof of concept of multiple programming projects and guide students through.

◇ Course Assistant in System Analysis and Design Sharif — FA 2012, SP 2013
Carried a group of students through their project's life-cycle. Project titles included Auto Insurance Information System, Paper Evaluation Information System and Inventory Management Information System.

◇ Miscellaneous: Assisted professors and students, in various degrees, in Computer Simulation, Database Design, Applications of Discrete Structures, Computer Structure and Language, and Introduction to Information Technology.

Freelance teacher of C programming to non-computer science majors.

RESEARCH EXPERIENCE

◇ **Research Assistant** on NSF 1320694 [MobiBench] UF — 2014 - 2020
Contributions:

· Designed, implemented and evaluated *en route*; a framework for traffic demand modeling and scenario generation based on traffic camera data.

· Proposed a measure of spatio-temporal trajectory similarity. Formulated trip matching problems for ride sharing applications using algorithms and graph theory.

· Assisted analysis of terabytes of network data for device-type aware mobility-traffic integrated modeling as part of a collaboration with Technical University of Munich, Germany.

· Designed ML and deep neural network architectures for prediction and forecasting of traffic density and location visitation in vehicular and pedestrian settings.

◇ **Independent Research Partner** 2017-2019

· Collaboration on GPU based wave based acoustic simulation.

· Collaboration on application of blockchain in circular economy in built environments.

INDUSTRY EXPERIENCE

◇ **Software Eng./Data Scientist Intern**, *GoDaddy Inc. - Sunnyvale, CA* Summer 2018
Supervisor: Wai-Kin Lau, Mentors: Jason Mackay, Nathan Howell

· Studied predictive text embeddings.

· Learned Tensorflow estimator API.

· Modeled and implemented (in Tensorflow as proof of concept) a portfolio based domain recommendation system based on seq2seq model with dynamic number of encoders.

◇ **Software Eng./Data Scientist Intern**, *GoDaddy Inc. - Sunnyvale, CA* Summer 2017
Supervisor: Wai-Kin Lau, Mentor: Siji Ambalathingal

· Design, implementation, and deployment of data anomaly framework (in R) with a focus on timeseries ARIMA model and Twitter-developed SH-ESD algorithm.

· Visualization in Tableau, with Rserve providing anomaly detection services.

· A brief machine learning analysis of bot generated web traffic flows.

PROFESSIONAL SERVICES

Reviewer for IEEE Intelligent Transportation Systems (ITS)

Reviewer for IEEE INFOCOM 2021

Reviewer for Elsevier Computer Communication

Reviewer for IEEE Access Magazine

Reviewer for IEEE INFOCOM 2020

Reviewer for Elsevier MICRO

Reviewer for Ad Hoc & Sensor Wireless Networks

Reviewer for ACM MSWiM 2019

Reviewer for IWCMC 2019

Reviewer for IEEE Transactions on Mobile Computing (TMC)

Advisor to Board of Iranian Student Association

TECHNICAL
SKILLS

Programming: C/C++, Python, R, comfortable with Java.

Machine Learning: SciPy (pandas, numpy, etc.), scikit-learn, Tensorflow, Keras, MS NNI, Weka, exposed to Apache ecosystem (MR, Hive, Spark), SQL.

Tools: SUMO Simulator, OpenStreet Maps, OMNeT++, NS-2, ONE Sim., Unix CLI, MS Office (+ Visio), Adobe Photoshop, LaTeX

Web: html, css, javascript (and jquery), PHP (symfony), Python (Django), C# (.Net).

Dev. Env.: Visual Studio, VS Code, Jetbrains IDEs (IntelliJ, Pycharm, and CLion).

Hardware: Verilog, ARM aarch64 assembly, MIPS assembly.

OS platforms: Windows, Linux and some experience on MacOS

SELECT
PROJECTS

◇ **Data Science**

· Map Reduce implementation of **PageRank** algorithm in Java on Amazon AWS EB2.

· **NIST 2015 pre-pilot evaluation.** Data cleaning, outlier detection, regression and event prediction on traffic data of DC. tri-state area (3 student team).

· Analysis of **health status of elderly community**. [Poster presented at UFII]

◇ **Mobile Computing**

· **BerryDroid:** a smart physical shopping cart system based on Raspberry Pi, RFID, smartphone apps and a Google App Engine hosted server (with a group of 7 graduate students).

· **MobiTrace:** an Android app to collect mobility traces and activities.

◇ **Operating Systems/Networks**

· Multi threaded (parallel) problem solving on C and Java and modification of freeBSD Kernel (process scheduler).

· Socket programming simplified Bittorrent client (Java) and turn-based terminal-based online game (C/C++).

· Raw socket programming (bit level) on PARTOV framework including OSPF router, Rule based firewall, Bandwidth controller with NAT gateway, and IPv4 Tunneling gateway.

· Design and implementation of a dual mode (p2p and server based) secure messenger protocol and application. [SHARK Messenger]

◇ **Others** including 2D Chess, 3D Checkers, Museum Management IS (Web-based .Net platform), various simulation problems (agent based workshop with MATLAB, vehicular mobility with SUMO and OSM, ad hoc network mobility with ONE Simulator).

SELECT COURSES	◇ Machine Learning, Math. for Intelligence Systems, Analysis of Multivariate Data, Intro to Data Science, Probability and Statistics.
	◇ Analysis of Algorithms, Advanced Data Structures, Database Management Systems.
	◇ Computer Networks, Advanced Computer Networks, Mobile Computing, Mobile Networking.
	◇ Computer Architecture, Adv. Computer Architecture, Computer structure and Language, Digital System Design
LANGUAGES	English (fluent), Persian/Farsi (native), Spanish (beginner)