

# Haluk Dogan

## Research Interest

My general areas of interest include machine learning, big data, artificial intelligence, and Bayesian model optimization. I have experience in building various models using decision trees, random forests, SVM, CRF, Naive Bayes, Bayesian Network, and deep learning architectures including but not limited to CNN, Bi-LSTM with Attention, Seq2Seq models, and VAE/CVAE for big data problems. Data grows rapidly and the need for efficient data processing and modeling increases. I am planning to direct my research toward building efficient systems that can deal with large volumes of data.

## Education

PhD	Computer Science	University of Nebraska-Lincoln, NE, USA	2018 - 2021
MS	Computer Engineering	Bogazici University, Istanbul, Turkey	2011 - 2013
BS	Computer Science	Istanbul Bilgi University, Istanbul, Turkey	2006 - 2010

## Experience

- Research Assistant** **University of Nebraska-Lincoln, NE, USA** **Aug 2018 - Current**
  - Built machine learning models with a focus on graphical models and Bayesian statistics
  - Built discriminative and generative deep learning architectures
  - Research resulted in 6 journal/conference publications
  - Technologies
    - Programming Languages: Python, R, Java, Bash, Anglican, Pyro
    - Deep Learning Frameworks: Tensorflow, PyTorch
    - Machine Learning Libraries: Numpy, Scipy, Scikit-learn, pyAgrum, Orange
    - Data Visualization: Matplotlib, ggplot2, Seaborn
    - Version Control: Git
    - Virtualization: Docker, Google Cloud Platform
    - Development and Runtime Environment: Linux, Emacs, Open Science Grid
- Co-founder/Python Developer** **Roomkita, Istanbul, Turkey** **Aug 2013 - Aug 2019**
  - Backend development for a travel agency website using Model-View-Controller (MVC) design pattern
  - Developed machine learning models to improve search results that prioritize user preferences based on user clicks
  - The company was featured in tnooz, a global provider of news related to travel technology
  - Technologies
    - Programming Languages: Python
    - Database: PostgreSQL
    - Version Control: Git, Subversion
    - Web Server: NGINX
    - Development and Runtime Environment: Linux, Emacs
- Teaching and Research Assistant** **Istanbul Bilgi University, Istanbul, Turkey** **Nov 2010 - Aug 2013**
  - Lead recitation/lab hours for "Introduction to Programming", "Probability and Statistics", "Bioinformatics" courses
  - Developed software for research activities in the department
  - Participated in the development and maintenance of college website

- **Java Software Developer** **i2i Systems, Istanbul, Turkey** **Mar 2010 – June 2010**
- Converted billing rules defined by analysts in plain text to LL grammars
  - Developed a program that parses plain text using defined grammars and update billing database
  - Software was incorporated into routine operations of the billing department to facilitate billing
  - Technologies
    - Programming Languages: Java
    - Libraries: Spring Framework, Hibernate ORM
    - Database: Oracle
    - Version Control: Subversion
    - Build System: Maven
    - Development and Runtime Environment: Linux, Eclipse, cron
- **Data Scientist** **GNA, Istanbul, Turkey** **Aug 2009 – Mar 2010**
- Performed Extract, Load, Transfer operations
  - Built data warehouse to prepare weekly business reports
  - Added custom features to an open source business intelligence tool
    - Programming Languages: Java
    - Business Intelligence Tool: Pentaho
    - Database: Oracle
    - Build System: Maven
    - Development and Runtime Environment: Linux, Oracle Software Developer
- **Java Developer** **Aradiom, Istanbul, Turkey** **Mar 2008 – Jun 2008**
- Developed backend/frontend of a regex editor to create cron jobs
    - Programming Languages: Java
    - Libraries: JBoss Seam Framework
    - Version Control: Subversion
    - Development and Runtime Environment: Linux, Eclipse

## Publications

1. Cui, J, J Shu, T Gao, and H Dogan (July 2019). Unraveling exosome-enabled cancer signaling: An integrated genomic approach. In: *Molecular and Cellular Biology / Genetics*. American Association for Cancer Research.
2. Dogan, H, Z Hakguder, S Scott, and J Cui (Nov. 2019). Elucidation of MicroRNA-Gene Regulation in Human Cancer with Integrative Network Models. In: *2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. IEEE.
3. Li, H, H Dogan, and J Cui (Nov. 2019). A New Approach to Batch Effect Removal Based on Distribution Matching in Latent Space. In: *2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. IEEE.
4. Quint, E, D Xu, H Dogan, Z Hakguder, S Scott, and M Dwyer (2019). Formal language constraints for markov decision processes. *arXiv preprint arXiv:1910.01074*.
5. Xu, D, E Quint, Z Hakguder, H Dogan, S Scott, and M Dwyer (2018). Constraining Action Sequences with Formal Languages for Deep Reinforcement Learning.
6. Tomov, ML, ZT Olmsted, H Dogan, E Gongorurler, M Tsompana, HH Otu, M Buck, EA Chang, J Cibelli, and JL Paluh (Dec. 2016). Distinct and Shared Determinants of Cardiomyocyte Contractility in Multi-Lineage Competent Ethnically Diverse Human iPSCs. *Scientific Reports* **6**(1).
7. Wang, F et al. (Feb. 2016). Detecting Microbial Dysbiosis Associated with Pediatric Crohn Disease Despite the High Variability of the Gut Microbiota. *Cell Reports* **14**(4), 945–955.
8. Dogan, H, H Can, and HH Otu (Jan. 2014). Whole Genome Sequence of a Turkish Individual. *PLoS ONE* **9**(1), e85233.

9. Nalbantoglu, U, A Cakar, H Dogan, N Abaci, D Ustek, K Sayood, and H Can (Aug. 2014). Metagenomic analysis of the microbial community in kefir grains. *Food Microbiology* **41**, 42–51.
10. Dogan, H and HH Otu (Aug. 2013). “Objective Functions”. In: *Methods in Molecular Biology*. Humana Press, pp.45–58.
11. Isci, S, H Dogan, C Ozturk, and HH Otu (Nov. 2013). Bayesian network prior: network analysis of biological data using external knowledge. *Bioinformatics* **30**(6), 860–867.