Sarah Alnegheimish

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Profile

I am a master student working at the Data to AI Lab, at Massachusetts Institute of Technology (MIT). My research interests lie within the application of artificial intelligence, machine learning, and network analysis on novel problems. In addition, I am interested in automating AI by relying on abstraction methods.

Education

2019 - Present | S.M. in Computational Science and Engineering
Center for Computational Science and Engineering
MIT, Cambridge | **G**PA: 5.0/5.0

2013 - 2017 | B.Sc. in Computer Science
Valedictorian
Computer Science Department
College of Computer and Information Sciences
King Saud University, Riyadh | **G**PA: 5.0/5.0

Experience

Dec 2017 - Aug 2019 | Research Affiliate
Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA.

Dec 2017 - Aug 2019 | Research Specialist
Center for Complex Engineering Systems at KACST and MIT (CCES)
Riyadh, Saudi Arabia.

May 2017 - Dec 2017 | Data Analyst
Mozn
Riyadh, Saudi Arabia.

Sep 2016 - Feb 2017 | Junior Teaching Assistant
Programming I, College of Computer and Information Sciences
King Saud University, Riyadh, Saudi Arabia.

May 2016 - July 2016 | Internship
Healthcare Information Technology Affairs
King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia.

Research Projects

Orion September 2019 - Present
MIT
Supervised by Dr. Kalyan Veeramachaneni

- Built a generative model to reconstruct time series data.
- Designed an anomaly score method to classify if a segment of time series is considered anomalous.
- Gauged the parameters of the model using signal-specific approaches.

Programming Languages & Tools: Python.

Cardea Sept 2018 - Present

Center for Complex Engineering Systems

Supervised by Dr. Kalyan Veeramachaneni & Dr. Mansour Alsaleh

- Developed an automated machine learning library that operates as an end-to-end system that enable users to solve prediction problems in regards to the health domain.
- Integrated Hl7's *Fast Healthcare Interoperability Resources* standard as a representation for electronic health records and hospital data.
- Manipulated data representation with the implementation of graph theory to eliminate relationship complexities.
- Automated the data ingestion, organization, and featurization components of the framework.

Programming Languages & Tools: Python.

Job & Skill Space Dec 2017 - May 2019

Center for Complex Engineering Systems

Supervised by Dr. Ahmad Alabdulkareem, Dr. Hotham Altwaijry, and Dr. Iyad Rahwan

- Analyzed national data to understand the relationship between skills by relying on their co-occurance within occupations.
- Developed a network that represents the relationship between occupations by adhering to their underlying skills, duties, work nature, and experience.
- Tested the functionality of traversing the constructed graph by comparing it to real-life job transitions of employees within the private sector.
- Analyzed the dynamics between various cities from an occupation perspective in terms of their corresponding wage, experience, specialization, and set of skills.

Programming Languages & Tools: Python, Matlab, & JavaScript.

Optimizing Faculty Schedules Sep 2016 - May, 2017

King Saud University

Bachelor's graduation project supervised by Dr. Manar Hosny

- Designed an algorithm to schedule courses and course sections to faculty members to obtain the most optimal solution.
- Formulated an objective function that takes faculty preference, variation in subjects, and minimizing gaps into account.
- Proposed the hybridization of the bees' algorithm with the demon algorithm & hill climbing.
- Tested the feasibility of the algorithm and verified its ability to be deployed.

Programming Languages & Tools: Python.

Professional Projects

Fraud and Anomoly Detection Oct, 2017 - Dec, 2017

Mozn

- Developed a model to detect fraud within transactions and imports for a governmental entity.
- Deployed the product to enhance fraud detection methods and improve inspection speed.

Programming Languages & Tools: Python & Spark.

Optical Character Recognition Aug, 2017 - Oct, 2017

Mozn

- Developed a model for Arabic and English character recognition within street images.
- Trained and tuned CNN, R-CNN, and faster R-CNN models and compared the results.
- Integrated the model to obtain vehicle number plates in real-time.

Programming Languages & Tools: Tensorflow.

Public Policy Analysis May, 2017 - June, 2017
Mozn

- Audited the application of policies for Citizen's Account, a national governmental product.
- Analyzed national data to recommend proper changes to the business requirements of product.
- Tested the validity of their current implementation of the product.

Programming Languages & Tools: Python, Tableau, & Alteryx.

Publications

- Geiger, A., Liu, D., **Alnegheimish, S.**, Cuesta-Infante, A., Veeramachaneni, K., TadGAN: Time Series Anomaly Detection Using Generative Adversarial Networks. *2020 IEEE International Conference on Big Data*. IEEE, 2020.
- **Al-Negheimish, S.**, Alrashed, N., Aleissa, F., Althobaiti, S., Liu, D., Alsaleh, M., Veeramachaneni, K., Cardea: An Open Automated Machine Learning Framework for Electronic Health Records. *2020 IEEE 7th International Conference on Data Science and Advanced Analytics (DSAA)*. IEEE, 2020.
- **Al-Negheimish, S.**, Alnuhait, F., Albrahim, H., Al-Mogherah, S., Alrajhi, M. and Hosny, M. (2018). An Intelligent Bio-Inspired Algorithm for the Faculty Scheduling Problem. *International Journal of Advanced Computer Science and Applications*, 9(5).

Presentations & Workshops

- **Cadea Platform for Smart Health Analytics** 30th Nov, 2018
  MIT Hacking Medicine, Riyadh, Saudi Arabia.
- **S^3: Saudi Skill Space** 14th Nov, 2018
  Misk Global Forum, Riyadh, Saudi Arabia.
- **Deep Learning for Image Recognition Workshop** 5th Mar, 2018
  Women in Data Science (WIDS), Riyadh, Saudi Arabia.

Courses

2017 | Data Analyst, *Udacity*

2016 | Machine Learning, *Coursera*

2012 | Exploring Engineering, *Brown University*

Honors & Awards

- Graduate Scholarship, King Abdulaziz City for Science and Technology (KACST).
- Graduated with a B.Sc. with First Class Honors, 2017.
- Valedictorian of College of Computer and Information Sciences, 2017.
- Best Capstone Project in College of Computer and Information Sciences, 2017.
- Dean's list for outstanding students at KSU during the academic year of 2015 & 2016.
- Qualified to the final stage of the International Mathematical Olympiad in 2012.

Skills

Programming | Python, R, Java, C, SQL, MATLAB, HTML, JavaScript, and LaTeX

Languages | Arabic, English