Alaa Alghwiri, Ph.D.

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Portfolio | LinkedIn Account | ResearchGate | GitHub

Professional Summary

Results-driven Data Scientist with a Ph.D. in Industrial Engineering and around a decade of impactful experience delivering data-driven insights and innovative solutions. Proven expertise across the entire data science life cycle, from data acquisition to solutions deployment using both R and Python. Strong background in cutting-edge machine and deep learning algorithms and statistical modeling at scale. Applied expertise in Healthcare, Energy, Higher Education, and Transportation industries, leveraging data science for real-world impact. Entrepreneur, teacher, researcher, effective communicator, and collaborative team player.

Education

- M.Sc. in Health Data Science, University of Pittsburgh, 2024 - 2026
- Ph.D. in Industrial Engineering, University of Akron, 2014 – 2017, GPA: (3.83/4.0)
- M.Sc. in Industrial Engineering, University of Akron, 2012 – 2014, GPA: (3.91/4.0)
- B.Sc. in Mechanical Engineering, Jordan University of Science and Technology, 2002 – 2007, GPA: (Good)

Teaching Experience

Adjunct Assistant Professor at TrineOnline University, Part Time, April 2024 – Current

- **Courses Taught**: Computer Science with Python, Research Statistics, Data Science and Big Data
  - Delivered course materials focused on statistical methods and analysis techniques pertinent to IT research. Guided students in applying statistical tools to real-world IT problems and projects
  - Taught fundamental and advanced concepts of computer science using Python. Created hands-on projects to reinforce learning and encourage practical application of programming skills
  - Instructed students on the principles and practices of data science and big data analytics

Data Science Instructor at Simplilearn, Part Time, April 2023- Current (Rating: 4.72/5.0)

- **Courses Taught**: Programming using Python, Applied Data Science with Python, Machine Learning, Deep Learning, Essentials of Generative AI
  - Instructed comprehensive courses on Data Science, covering a spectrum from foundational mathematical and statistical concepts to advanced topics
  - Designed and delivered engaging modules on data exploration, visualization techniques, and best practices, fostering a deep understanding among students
  - Equipped learners with practical skills in applied Data Science and Machine Learning, utilizing both R and Python programming languages
  - Received consistently positive feedback for adeptly balancing theoretical knowledge with hands-on learning experiences, ensuring students grasp concepts effectively and confidently apply them in real-world scenarios
  - Demonstrated expertise in simplifying complex concepts, fostering a dynamic and inclusive learning environment, and providing personalized guidance to students of varying skill levels, contributing to high course completion rates and student satisfaction

Entrepreneurial Experience

Co-founder and CTO at Algebra Intelligence, Part Time, January 2020 - November 2022

- Led a pioneering team in creating and deploying Taqtak, a groundbreaking mobile/web application that revolutionizes real-time monitoring within energy plants. Successfully secured $1,060,000 in funding in the pre-seed stage
- Spearheaded the development lifecycle from conceptualization to execution, overseeing database architecture, backend infrastructure, and front-end design to ensure seamless integration and optimal performance
- Led the data science team in the conceptualization and development of an energy generation forecasting tool using advanced statistical analysis and machine learning algorithms

Professional Experience

Senior Research/Data Scientist at University of Pittsburgh-Center for Population Health Management, Full Time, July 2022 - Current

- Extensive experience utilizing Electronic Health Records (EHR) for analysis, demonstrating a deep familiarity with preparing and leveraging EHR data for both statistical and predictive purposes
- Utilized causal forest algorithms to evaluate heterogeneity in treatment effects, allowing for a nuanced understanding of how different patient subgroups respond to various interventions
- Spearheaded the development of precise predictive models aimed at identifying patients susceptible to adverse events through the implementation of sophisticated machine learning methodologies
- Tested the effectiveness of a multifaceted Electronic Health Records (EHR)-based Population Health Management (PHM) intervention to improve evidence-based Chronic Kidney Disease care in high-risk patients (Utilized A/B testing, Mixed-effect modeling and Survival Analysis)
- Utilized mixed-effect models, factor and principal component analyses to analyze the impact of various factors on pain, fatigue, and depression
- Designed and implemented a Tkinter application in Python to map addresses into the Area Deprivation Index (ADI), facilitating targeted resource allocation for underserved communities

Data scientist at University of Pittsburgh-Office of the Provost, Full Time, October 2017-June 2022

- Utilized data analytics tools to automate generation of yearly/ad-hoc insights in static and dynamic formats, integrating data from multiple resources for students, faculty, and University data management
- Improved University of Pittsburgh's US News Ranking by 4 steps (between 2020 and 2021) using cutting-edge Machine Learning techniques including SVM, Random Forest, and Gradient Boosting
- Developed highly accurate (96%) predictive models for students' success indicators (retention, dropout, and graduation) across all 3 regional campuses, enabling proactive advising for students in need
- Collaborated with schools' deans to make data-informed investment decisions, optimizing the school's US News and World Report ranking
- Automated recurring reports on gender and ethnic group equity, as well as admission and financial aid reports for the office of the provost and deans

Honors and Awards

- Honored listee in Marquis Who's Who America (2024)
- As a co-founder at Algebra Intelligence, my partner and I successfully secured $750,000 in seed funding in November 2022, led by Ibtikar venture capital (Link)
- As a co-founder at Algebra Intelligence, my partner and I successfully secured $310,000 in pre-seed funding in May 2021, led by Oasis500 venture capital (Link)
- Full scholarship including tuition and salary to pursue M.Sc. and PhD at University of Akron (2012-2017)

Peer-Reviewed Articles (Publications listed below are hyperlinked for easy access)

- **Journals:**
  - **Alaa A Alghwiri,** Melanie R Weltman, Linda-Marie Lavenburg, Han, Zhuoheng, Thomas D. Nolin, Yi-Fan Chen, Jonathan G. Yabes, Manisha Jhamb. **Using Machine learning to predict medication therapy problems among patients with chronic kidney disease.** American Journal of Nephrology.
  - **Alghwiri, Alaa A.,** Kallem, Cramer J., Yabes, Jonathan, Erickson, Sarah, Han, Zhuoheng, Roumelioti, Maria-Eleni, Steel, Jennifer L., Unruh, Mark, Jhamb, Manisha, **Using Ecological Momentary Assessment to Redefine Postdialysis Fatigue in Patients with Kidney Failure**. Journal of the American Society of Nephrology ():10.1681/ASN.0000000650, February 25, 2025. | DOI: 10.1681/ASN.0000000650
  - Melanie R Weltman, Linda-Marie U Lavenburg, Zhuoheng Han, **Alaa A Alghwiri**, Mitra Mosslemi, Bruce L Rollman, Gary S Fischer, Thomas D Nolin, Jonathan G Yabes, Manisha Jhamb. **Population Health Management and Guideline-Concordant Care in CKD: A Secondary Analysis of K-CHAMP.** Journal of the American Society of Nephrology, November 1, 2024. DOI: 10.1681/ASN.0000000544
  - Kallem, Cramer J.; **Alghwiri, Alaa A**.; Yabes, Jonathan; Erickson, Sarah; Han, Zhuoheng; Roumelioti, Maria-Eleni; Steel, Jennifer L.; Jhamb, Manisha,a; Unruh, Mark. **Diurnal and Daily Symptom Variation in Patients with End-Stage Kidney Disease: An Ecological Momentary Assessment Study**. Clinical Journal of the American Society of Nephrology, July 16, 2024. DOI: 10.2215/CJN.0000000000000524
  - Kallem, Cramer J.; **Alghwiri, Alaa A.;** Yabes, Jonathan G.; Roumelioti, Maria-Eleni; Erickson, Sarah; Rollman, Bruce L.; Weisbord, Steven; Unruh, Mark; Vodovotz, Yoram; Jhamb, Manisha,a; Steel, Jennifer L. **Association of Symptoms and Collaborative Care Intervention (TĀCcare) with Systemic Inflammation Biomarkers in End-Stage Kidney Disease**. Kidney360, July 16, 2024. DOI: 10.34067/KID.0000000000000512
  - Jhamb, M., Weltman, M. R., Devaraj, S. M., Lavenburg, L. M. U., Han, Z., **Alghwiri, A. A**., ... & Yabes, J. G. (2024). **Electronic Health Record Population Health Management for Chronic Kidney Disease Care: A Cluster Randomized Clinical Trial**. *JAMA Internal Medicine*.
  - Al-Zaiti, S. S., **Alghwiri, A. A**., Hu, X., Clermont, G., Peace, A., Macfarlane, P., & Bond, R. (2022) **A clinician's guide to understanding and critically appraising machine learning studies: a checklist for Ruling Out Bias Using Standard Tools in Machine Learning (ROBUST-ML)**. *European Heart Journal-Digital Health*, *3*(2), 125-140
  - Alghwiri, A. A., Almomani, F., **Alghwiri, A. A.**, & Whitney, S. L. (2021). Predictors of sleep quality among university students: the use of advanced machine learning techniques. *Sleep and Breathing*, *25*, 1119-1126
- **Published abstracts and proceedings:**
  - M.R. Weltman, **A.A. Alghwiri**, Z. Han, L.U. Lavenburg, T.D. Nolin, J.G. Yabes,, Y. Chen, M. Jhamb. **Prediction of medication therapy problems in patients with moderate- to high-risk chronic kidney disease**: American Society of Nephrology (ASN) 2024
  - Linda-Marie Lavenburg, Zhuoheng Han, Mitra Mosslemi, **Alaa Alghwiri,** Thomas Nolin, Melanie Weltman, Jonathan Yabes, Manisha Jhamb. **Impact of Population Health Management to Modify Disparate Use of SGLT2i/GLP1Ras:** American Society of Nephrology (ASN) 2024
  - Kallem CJ, Roumelioti M, **Alghwiri AA**, Yabes JG, Jhamb M, Unruh M. **Day-to-day and diurnal variations in patient-reported symptoms among patients on dialysis**. Poster presentation at: National Kidney Foundation 2024 Spring Clinical Meetings. May 14-18, 2024; Long Beach, CA. Abstract ID: 4454
  - Kallem CJ, **Alghwiri AA,** Yabes JG, Roumelioti M, Erickson S, Unruh M, Vodovotz Y, Jhamb M, Steel JL. **Associations between pain, depression, fatigue, and cytokines in patients with**

end-stage kidney disease. Poster presentation at: Society of Behavioral Medicine 45th Annual Meeting & Scientific Sessions. March 13-16, 2024; Philadelphia, PA. Abstract ID: 1623084

- Manisha Jhamb, Melanie Weltman, Susan Devaraj, Linda-Marie Lavenburg, Zhuoheng Han, **Alaa Alghwiri**, Gary Fischer, Bruce Rollman, Thomas Nolin, Jonathan Yabes. **Electronic Health Record based Population Health Management to optimize care in CKD: A Cluster Randomized Clinical Trial (Kidney CHAMP)**: American Society of Nephrology (ASN) 2023; Philadelphia, PA
- MR Weltman, Z Han, **AA Alghwiri**, J Yabes, LU Lavenburg, TD Nolin, M Jhamb. **Use of guideline-recommended medication therapy in a high-risk chronic kidney disease population in the Kidney CHAMP trial**: American Society of Nephrology (ASN) 2023; Philadelphia, PA
- Susan M. Devaraj, Jonathan Yabes, **Alaa Alghwiri**, Manqi Cai, Linda-Marie Lavenburg, Khaled Abdel-Kader, Manisha Jhamb. **A demographic and community characteristic comparison of advanced chronic kidney disease patients seeing versus not seeing a nephrologist**: American Society of Nephrology (ASN) 2022; Tampa, FL
- **Alghwiri, A.**, Wang, S., & Coleman, J. D. (2017). **University Parking System Analysis through Discrete Event Simulation**. In *IIE Annual Conference. Proceedings* (pp. 2039-2044). Institute of Industrial and Systems Engineers (IISE)
- **Alghwiri, A.**, Wang, S., & Coleman, J. D. (2017). **Modeling and Optimizing University Shuttle Bus System through Bus Diversions**. In *IIE Annual Conference. Proceedings* (pp. 2045-2050). Institute of Industrial and Systems Engineers (IISE)

Talks and Presentations (** denotes my role as a main presenter)

- ****Alghwiri, A.**, Monica Rattigan, Nancy Tannery, **Evaluating the Impact of Digital Content on Student Course Outcomes,** Advanced Analytics Summit- University of Pittsburgh, 2021
- Won Kaggle competition arranged by Microsoft Company, Pittsburgh-PA (2021), **Using Advanced Machine Learning Approaches to Predict Crime in California**
- ****Alghwiri, A.**, Amanda Brodish, Steven Wisniewski, **Viewbook Analyses Using Data-Driven Decision-Making Approaches.** Cornell University Forum- University of Pittsburgh, 2019
- ****Alghwiri, A.**, Wang, S., & Coleman, J. D. (2017). **University Parking System Analysis through Discrete Event Simulation**. In *IIE Annual Conference. Proceedings* (pp. 2039-2044). Institute of Industrial and Systems Engineers (IISE)
- ****Alghwiri, A.**, Wang, S., & Coleman, J. D. (2017). **Modeling and Optimizing University Shuttle Bus System through Bus Diversions**. In *IIE Annual Conference. Proceedings* (pp. 2045-2050). Institute of Industrial and Systems Engineers (IISE)

Guest Speaking

- **Invited Speaker, "Decision Making Under Uncertainty Using Reinforcement Learning"** University of Pittsburgh- School of Nursing, 2020.
- **Invited Speaker, "Introduction to Big Data Analytics in The Healthcare Industry"** University of Pittsburgh- School of Nursing, 2019.

Editorial and Media Reports About my Achievements

- 10 sustainable startups in Middle East North Africa (MENA) (Link)
- Who's who Energy, Water and Environment (Link)
- Digitizing the energy sector in Jordan (Link)

Committees

- Advisory board member at Yarmouk University- Computer Science Department (2022 – Present)
- Advisory board lead at Algebra Intelligence (2022 – Present)

Membership in Professional and Scientific Societies

- American Society for Quality (ASQ)
- Institute of Industrial and System Engineering (IISE)
- American Society of Nephrology (ASN)

Training & Certificates

- Computational thinking using Python- 2022 (MITx)
- Introduction to Computer Science and Programming Using Python- 2020 (MITx)
- SQL Tips, Tricks, & Techniques- 2019 (LinkedIn Learning)
- Git Branches, Merges, and Remotes- 2019 (LinkedIn Learning)
- Python for Data Science- 2018 (Udemy)
- Extending Hadoop for Data Science- 2018 (LinkedIn Learning)
- Machine Learning A-Z: Hands on Using R and Python- 2018 (Udemy)
- Learning Git and GitHub- 2018 (LinkedIn Learning)
- Mastering Tableau for Visualization- 2018 (LinkedIn Learning)
- Advanced SQL for Data Scientists- 2017 (LinkedIn Learning)
- Apache Spark for Big Data Applications- 2017 (LinkedIn Learning)
- Machine Learning and AI foundation- 2017 (LinkedIn Learning)
- Practical Data Science in R- Certificate, 2017 (Udemy)
- Advanced Analytics in R for Data Science- 2017 (Udemy)
- R Programming A-Z- 2017 (Udemy)
- AWS Big Data- 2017 (LinkedIn Learning)
- Certified Six Sigma Green Belt, American Society for Quality (ASQ)- 2017
- Rapid Modeling with Simio Intelligent Objects- 2016

Computer Skills

- Programming/Scripting: Python, R, Julia, SQL, VBA, Unix/Linux, Git
- Databases: Hadoop, Spark, PostgreSQL, MySQL, Oracle, Apache Cassandra, Mongo DB
- Cloud Services: Digital Ocean, Amazon Web Services, Google Cloud, and Microsoft Azure
- Other Tools: Tableau, Jupyter Notebook, Toad, Ubuntu VM, MS Office, Simio, Jira and Docker

Soft Skills

- Critical Thinking, Curiosity, Problem Solving, Professional Communication, Creativity, Lifetime Learning, Professional Presentations, Public Speaking, Multi-domain Knowledge and Story Telling