Rakan A. Alseghayer

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OBJECTIVE

- Work in a challenging, dynamic, and modern environment where I could apply my scientific research, problem solving, and mentoring skills to solve complex and challenging technical and business work-flow related problems, such as storage systems, data intensive systems, and process optimization problems. Moreover, the ability to mentor co-workers, leverage my social skills, and embrace my outgoing personality for the purpose of helping teams to thrive and succeed is a corner stone of my value system.

EDUCATION

- **University of Pittsburgh** — Pittsburgh, PA, USA
  Ph.D. in Computer Science — *August 2023*
  Thesis Title: *Optimizing Operators for Temporal and Spatiotemporal Data*
  Academic Advisor: *Dr. Panos K. Chrysanthis (panos@cs.pitt.edu)*

- **University of Pittsburgh** — Pittsburgh, PA, USA
  M.Sc. in Information Sciences; GPA: 3.98/4 — *April 2013*
  Specialization: *Information Security and Networking*

- **University of Washington** — Seattle, WA, USA
  Educational Outreach Program — *March 2011*
  - **Certificate**: Business for International Professionals.
  - **Certificate**: Fundamentals of Project Management.
  - **Certificate**: ELP Campus Intensive English Program (IEP).

- **King Saud University** — Riyadh, KSA
  B.Sc. in Computer Science; GPA: 4.68/5 — *June 2008*

WORK EXPERIENCE

- **University of Pittsburgh** — Pittsburgh, PA
  Researcher at the Advanced Data Management Technologies (ADMT) Lab — *May 2022 - Aug. 2023*
  - **Tracking Horizontal Inequalities Across Dimensions to Forecast and Understand Instability (TRIAD) project**: 1) Containerizing (Dockerizing) few Python applications. 2) Transferring few Python modules to C++11 back-end servers.
  - **NIH - Causal MGM (Project ID 0136449)**: 1) Developed modules in Python that incorporates R codes for a web interface. 2) Extracting visualizations across data pipelines. 3) Researched causality between features.

- **University of Pittsburgh** — Pittsburgh, PA
  Teaching Assistants Mentor — *Aug. 2022 - Dec. 2022*
  - Provided one-to-one support to TAs helping resolving issues that they face on daily basis.
  - Curated a reference of resources for TAs and new TAs at the CS department.
  - Formed guides and procedures that help managing the TA-instructor relationship and increase the chances of successful collaboration.

- **Saee** — Riyadh, KSA
  Project Coordinator — *Jul. 2019 - Nov. 2019*
  - Developed an algorithm to optimize the delivery of lunch meals during lunch rush hour.
  - Developed and implemented an incentive based module to captains (freelancers) to insure high availability of captains during lunch hour.
  - Came up with complete business requirements specifications document that covered supporting two food business models: (application, webApp, etc).

- **University of Pittsburgh** — Pittsburgh, PA
  Lecturing Teaching Assistant — *2017 - 2022*
  - **CS1555/2055 Database Management Systems (6 semesters)**: Provides an in-depth knowledge of database systems design through modeling and using existing DBMSs. The relational model is discussed in great detail, while the NoSQL model is briefly discussed.

- **CS1501 Algorithms & Data Structures 2 (2 semesters)**: A programming intensive course that covers a broad range of the most commonly used algorithms, such as searching, encryption, compression, graphs, and dynamic programming.
- **CS0011 Introduction to Computing for Scientists**: Covers how a computer works and how to write programs in Python in order to use the computer as a problem solving tool. Problems discussed are related to the natural sciences with an emphasis on computational biology.

- **University of Pittsburgh**   Pittsburgh, PA
  Teaching Assistant   *2015 - 2023*
  - **CS2550 Principles of Database Systems (3 semesters)**: Covers in-depth knowledge of DBMSs design including detailed coverage of internal structures, physical storage models, concurrency control, recovery, query optimization, distributed databases, distributed concurrency control, and fault tolerance.
  - **CS1645/2045 Introduction to High Performance Computing (2 semesters)**: Introduction to the architecture of and software techniques for parallel and high performance computing systems, such as vector processing, shared-memory, and distributed-memory systems.

- **King Saud University**   Riyadh, KSA
  Lecturing Teaching Assistant   *Aug. 2013 - Jul. 2014*
  - **CSC311 Design and Analysis of Algorithms**: Covers mathematical essentials; sorting; space and time complexity theory; algorithm design methods: greedy algorithms, divide and conquer, and dynamic programming; introduction to graph theory; and NP-completeness.
  - **CSC113 programming -2-**: Advanced concepts and topics such as relationships between classes, inheritance, polymorphism, abstract classes, error handling, interfaces, generics, and data structures (e.g., linked lists, stacks and queues).
  - **CSC215 Procedural Programming using C Language**: Introduction to the procedural programming paradigm that covers a brief history of C, C primitive data types, variables and constants, operators (arithmetic operators, logical operators, etc.), control structures, procedures and parameter passing, user defined types, and pointers.
  - **CSC111 programming -1-**: Covers the basic concepts of Object Oriented programming approach such as abstraction and encapsulation principles, classes, objects, constructor concepts, information hiding principle and setters and getters, methods, message passing and overloading principle.

- **Advanced Electronics Company Ltd. (AEC)**   Riyadh, KSA
  Associate Software Engineer, Systems Development, R&D Department   *Oct. 2008 - Jul. 2009*
  - **Industrial Business Unit**: Under the smart energy meter system project (ADDAD4), I developed parts of the Data Collection Unit (DCU), and the communication protocol (using TCP/IP) under the .Net environment.
  - **Military Business Unit**: I developed parts of a military encrypted data communication system over tactical radios.

Summary of Skills

- **Programming languages**: C++ ($\sim$ 40k LOC), JAVA ($\sim$20k LOC), Python ($\sim$25k LOC), SQL ($\sim$30k LOC).
- **Strong code debugging and profiling skills**: JetBrains IDEs (CLion, IntilliJ, PyCharm, DataGrip), Valgrind, cProfile.
- **DBMSs**: PostgreSQL, Oracle, MySQL, SQLite.
- **Programming libraries**: Scikit-learn, TensorFlow, NumPy, Scipy, Matplotli.
- **Strong software design, software patterns, and solutions architecture background.**

- **Tools**: LaTeX, Git, Docker, Kubernetes.
- **Security**: Secured Java, Cryptography.
- **Computer networks**: gRPC, TCP/IP programming, Traffic and Packet Monitoring (Wireshark, IPTraf), Network performance analysis, Routing Protocols.
- **Outstanding writing skills**: Published in journals, conferences proceedings, technical reports, and proposals.
- **Outstanding presentation skills**: Presented in scientific conferences, gave regular talks at the department of computer science.
- **Natural languages**: Arabic (Native), English (Bilingual Proficiency), Spanish (Beginner).
- **Outstanding problem solving, strategic thinking, mentoring, communication, and social skills.**

Publications & Presentations

- R. Alseghayer, Panos K. Chrysanthis, C. Costa. "Duration Constrained Temporal Aggregation Query Processing for Contact Tracing in Indoor Spaces." [**Manuscript Submitted**].

- Alseghayer R., Petrov D., Chrysanthis P.K., Sharaf M., Labrinidis A. "DCS: A Policy Framework for the Detection of Correlated Data Streams." [**Lecture Notes in Business Information Processing, vol 337. Springer**].

- B. Nixon, R. Alseghayer, C. Costa, B. Graybill, X. Zhang, and P. K. Chrysanthis, "Efficient Detection of COVID-19 Exposure Risk." [**IEEE MDM '22**].

- *Presented* – Rakan Alseghayer. "Racoon: Rapid Contact Tracing of Moving Objects Using Smart Indexes." [**IEEE MDM '21**].

- Daniel Petrov, Rakan Alseghayer, Panos K. Chrysanthis, Daniel Mosse. "Smart Room-by-Room HVAC Scheduling for Residential Savings and Comfort." [**IGSC '19**].

- D. Petrov, R. Alseghayer, P. K. Chrysanthis. "Mitigating Congestion Using Environment Protective Dynamic Traffic Orchestration." [**MDASC '19 - Colocated with IEEE MDM '19**].

- *Presented* – Rakan Alseghayer, Panos K. Chrysanthis, Bruce R. Childers. "Reproducibility Score for Computational Artifacts." [**MWS '19**].

- Daniel Petrov, Rakan Alseghayer, Daniel Mosse, Panos K. Chrysanthis. "Data-Driven User-Aware HVAC Scheduling." [**IGSC '18**].

- *Presented* – Rakan Alseghayer, Daniel Petrov, Panos K. Chrysanthis. "Strategies for Detection of Correlated Data Streams." [**ExploreDB '18 - Colocated with ACM SIGMOD '18**].

- R. Alseghayer, D. Petrov, P. K. Chrysanthis, M. Sharaf, A. Labrinidis. "Detection of Highly Correlated Live Data Streams." [**BIRTE '17 - Colocated with VLDB '17**].

- *Presented* – D. Petrov, R. Alseghayer, M. Sharaf, P. K. Chrysanthis, A. Labrinidis. "Interactive Exploration of Correlated Time Series." [**ExploreDB '17 - Colocated with ACM SIGMOD '17**].

SERVICE & MEMBERSHIPS

- **Grand Awards Judge – Embeded Systems Track**: The Regeneron International Science and Engineering Fair (ISEF 2023).

- **Website Management & Online Arrangements**: The International Workshop on Self-Managing Database Systems (SMDB '23).

- **Committee Member**: Diversity and Inclusion (D&I) compliance committee in The 16th ACM International Conference on Distributed and Event-based Systems (ACM DEBS '22).

- **Student Volunteer**: The International Workshop on Self-Managing Database Systems (SMDB '21, SMDB '22).

- **External Reviewer**: The International Conference on Very Large Data Bases (VLDB '17, '21, '22).

- **External Reviewer**: The International Conference on Database Systems for Advanced Applications (DASFAA '21).

- **External Reviewer**: The annual IEEE International Conference on Data Engineering (IEEE ICDE '17, '19, '20, '21).

- **External Reviewer**: The ACM Special Interest Group on Management of Data (ACM SIGMOD '17).

- **External Reviewer**: The IEEE International Conference on Mobile Data Management (IEEE MDM '18, '19).

- **External Reviewer**: The Conference on Information and Knowledge Management (ACM CIKM '19).

- **External Reviewer**: The ACM/IEEE Conference on Internet of Things Design and Implementation (IoTDI '17).

AWARDS, SCHOLARSHIPS & HONORS

- Recipient of the student scholarship for the cybersecurity event Black Hat (2022).

- Recipient of the Diversity and Inclusion Award at the Ph.D. forum of the 22nd IEEE International Conference on Mobile Data Management (MDM 2021).

- Recipient of the People's Choice of Best Pitch Video at the 22nd IEEE International Conference on Mobile Data Management (MDM 2021).

- PITT CS Department Orrin E. and Margaret M. Taulbee Award runner-up (2021).

- Recipient of the student travel grant for the 11th International Workshop on Real-Time Business Intelligence & Analytics (BIRTE 2018).

- Recipient of the King Saud University scholarship for a PhD in Computer Science (2014 - 2020).

- Recipient of the Saudi Arabian Cultural Mission Scholarship for a MS in Information Science (2010 - 2012).

- Undergrad Second Class Honors from King Saud University (2008).

VOLUNTEERING

- Food distribution for the Greater Pittsburgh Community Food Bank.

- Web developer for NephroTalk Conservative Care Curriculum website http://nephro-talk.com/).

- Web developer for the Pittsburgh Squash Federation website (https://pitt-squash-fed.github.io).

- IT support for the YouTube channel MusiCare Connections.