

Rakan A. Alseghayer

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EDUCATION

- **University of Pittsburgh** Pittsburgh, PA, USA
Ph.D. in Computer Science
Aug. 2014 - present
Thesis: Optimizing Operators for Temporal and Spatiotemporal Data
Advisor: Prof. Panos K. Chrysanthis (panos@cs.pitt.edu)
- **University of Pittsburgh** Pittsburgh, PA, USA
M.Sc. in Information Sciences; GPA: 3.98/4
May 2011 - Apr. 2013
Specialization: Information Security and Networking
- **King Saud University** Riyadh, KSA
B.Sc. in Computer Science; GPA: 4.68/5
Aug. 2004 - Jun. 2008

WORK EXPERIENCE

- **University of Pittsburgh** Pittsburgh, PA
Graduate Student Researcher (GSR)
May 2022 - present
- **University of Pittsburgh** Pittsburgh, PA
Teaching Assistants Mentor
Aug. 2022 - present
- **Advanced Electronics Company Ltd. (AEC)** Riyadh, KSA
Associate Software Engineer, Systems Development, R&D Department
Oct. 2008 - Jul. 2009
 - **Industrial Business Unit:** Developed parts of the DCU "Data Collection Unit" as well as the communication part "TCP/IP" under the .Net environment for the project (ADDAD4), which is a smart energy meter system.
 - **Military Business Unit:** Developed parts of a military encrypted communication system.

TEACHING EXPERIENCE

- **University of Pittsburgh** Pittsburgh, PA
Lecturing Teaching Assistant
2015 - Apr. 2022
 - **CS1555/2055 Database Management Systems:** Spring '20, Fall '20, Spring '21, Fall '21, Spring '22.
 - **CS1501 Algorithm Implementation:** Spring '20, Fall '20, Spring '21, Fall '21, Spring '22.
 - **CS0011 Introduction to Computing for Scientists:** Summer '21.
- **University of Pittsburgh** Pittsburgh, PA
Teaching Assistant
2015 - Apr. 2022
 - **CS2550 Principles of Database Systems:** Spring '21, Spring '22.
 - **CS1645/2045 Introduction to High Performance Computing:** Fall '15, Fall '16.
- **King Saud University** Riyadh, KSA
Lecturing Teaching Assistant
Aug. 2013 - Jul. 2014
 - **CS311 Design and Analysis of Algorithms:** Spring '14.
 - **CS113 programming -2-:** Spring '14.
 - **CS215 Procedural Programming using C Language:** Fall '13.
 - **CS111 programming -1-:** Fall '13.

SELECTED COURSE WORK PROJECTS

- **Simple Remote Procedure Call System:** We implemented a client, server, and a port-mapper. We addressed issues related to parameter passing, binding, exception handling, call semantics, performance and data representation. We achieved server high availability and load balancing through replication and name resolution respectively.
- **MiniGoogle: Document Indexing and Querying:** We implemented a basic data-intensive application to index and search large documents. The goal is to design a simple search engine, referred to as tiny-Google, to retrieve documents relevant to simple search queries submitted by users. We did implement a replicated and reliable client/server model that consists of: the client, the server (has the indexing and querying masters), the helpers (for the mapping and reducing), and the name-server (for name resolution).
- **Simplified File Transfer Protocol System:** The purpose of a file transfer protocol is to enable the transfer of files between machines, typically under the command of a user. We addressed several issues in the design including dealing with differences in file name conventions, text and data representation, and directory structure. Furthermore, the protocol ensured reliable transfer of files from one system to another. We did implement the system in a layered fashion with a replicated and load balanced servers and name-servers. Also, we did implement an error simulation module to introduce unreliability to the medium. We used the Go-Back-N as a sliding window protocol. Consequently, we did conduct a thorough analysis of the performance of the system with multiple experiments. Those involved different packet error rates, different packet drop rates, and different retransmission timeouts.
- **myTRC: my Transactional Row Column store DBMS:** The objective of the project is to develop the Transactional Row Column store (myTRC) that efficiently supports concurrent execution of OLTP (i.e., transactions) and OLAP (i.e., aggregate queries) workloads. myTRC provides limited transactional support. Limited support means that it does not support full durability. In addition to serializable and atomic access, it also provides the standard uncontrolled access to files.

SELECTED PUBLICATIONS

- Alseghayer R., Petrov D., Chrysanthos 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. Chrysanthos, “Efficient Detection of COVID-19 Exposure Risk.” [**IEEE MDM ‘22**].
- Rakan Alseghayer. “Racoon: Rapid Contact Tracing of Moving Objects Using Smart Indexes.” [**IEEE MDM ‘21**].
- Daniel Petrov, Rakan Alseghayer, Panos K. Chrysanthos, Daniel Mosse. “Smart Room-by-Room HVAC Scheduling for Residential Savings and Comfort.” [**IGSC ‘19**].
- Daniel Petrov, Rakan Alseghayer, Daniel Mosse, Panos K. Chrysanthos. “Data-Driven User-Aware HVAC Scheduling.” [**IGSC ‘18**].

TRAINING

- **University of Washington** Seattle, USA
Educational Outreach Program *Jan. 2010 - Mar. 2011*
 - **Certificate:** Business for International Professionals
 - **Certificate:** Fundamentals of Project Management
 - **Certificate:** ELP Campus Intensive English Program (IEP)
- **Etihad Etisalat “Mobily”** Riyadh, KSA
Trainee, Enterprise Resource Planning (ERP) Department *Oct. 2008 - Jul. 2009*
 - **Developed a knowledge base application under the .Net environment where the ERP team can log their day-to-day problems and challenges with their resolutions.**

AWARDS, SCHOLARSHIPS & HONORS

- Student scholarship winner for the cybersecurity event Black Hat ‘22.
- Awarded the Diversity and Inclusion Award at the Ph.D. forum of the 22nd IEEE International Conference on Mobile Data Management (MDM ‘21).
- Awarded the People’s Choice of Best Pitch Video at the 22nd IEEE International Conference on Mobile Data Management (MDM ‘21).
- PITT CS Department Orrin E. and Margaret M. Taulbee Award runner-up (2021).
- Student travel grant winner for the 11th International Workshop on Real-Time Business Intelligence & Analytics (BIRTE ‘18).
- King Saud University Scholarship for a PhD in Computer Science (2014 - present).
- Saudi Arabian Cultural Mission Scholarship for a MS in Information Science (2010 - 2012).
- Graduated undergrad with Second Class Honors from King Saud University (2008).

PROFESSIONAL SERVICE & MEMBERSHIPS

- **Committee Member:** Diversity and Inclusion (D&I) compliance committee in The 16th ACM International Conference on Distributed and Event-based Systems (DEBS ‘22).
- **Student Volunteer:** The International Workshop on Self-Managing Database Systems (SMDB ‘21, SMDB ‘22).
- **Conference External Referee:** (VLDB ‘17, ‘21, ‘22), (ACM SIGMOD ‘17), (ACM CIKM ‘19), (IEEE MDM ‘18, ‘19), (ACM/IEEE IoTDI ‘17), (IEEE ICDE ‘17, ‘19, ‘20, ‘21), (DASFAA ‘21).

SKILLS SUMMARY

- **Prog. Languages:** Python, C++, JAVA, SQL
- **DBMSs:** PostgreSQL, Oracle, MySQL, SQLite
- **Frameworks:** Scikit-learn, TensorFlow, NumPy, Scipy, Matplotlib
- **Tools:** Git, Docker
- **Security:** Secured Java, Cryptography
- **Computer Networks:** TCP/IP programming, Traffic and Packet Monitoring (Wireshark, IPTraf), Performance Analysis, Routing Protocols
- **Natural Languages:** Arabic (Native), English (Bilingual Proficiency), Spanish (Beginner)

VOLUNTEERING

- Food distribution for the Greater Pittsburgh Community Food Bank.
- Web developer for NephroTalk Conservative Care Curriculum.
- IT support for MusiCare Connections.