Dr. Hamoud Aljamaan

Personal Data

Place and Date of Birth:	Kuwait, 1985
Address:	KFUPM, ICS dept. Building: 22, Room: 323
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email:	hjamaan AT kfupm DOT edu DOT sa

Education

Dec 2015 | **Doctor of Philosophy** in Computer Science | Emphasis: Software Engineering
University of Ottawa, Ottawa, Canada
Academic supervisor: Prof. Timothy Lethbridge
Dissertation: *"Model-Oriented Tracing Language*: Producing Execution Traces from Tracepoints Injected into Code Generated from UML Models" [pdf]

June 2009 | **Master of science** in Computer Science | Emphasis: Software Engineering
King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
Academic supervisor: Dr. Mahmoud Elish
Thesis: "Software Quality Assessment using Ensemble Models" [pdf]

June 2006 | **Bachelor of science** in Computer Science
King Saud University, Riyadh, Saudi Arabia.
Graduation project supervisor: Dr. Mohsen Denguir
Graduation Project: "Electronic Ordering System Using Hand-held Devices"

Work Experience

Chairman

Jan 2019 – Aug 2023 | **King Fahd University of Petroleum and Minerals**, Saudi Arabia.
Information and Computer Science department
Key accomplishments
+ Establishment of the Artificial Intelligence and Machine Learning undergraduate concentration
+ Establishment of the Master of Artificial Intelligence program
+ Establishment of the Cybersecurity and Blockchains undergraduate concentration
+ Establishment of the Master of Cybersecurity programm
+ Establishment of the annual "4IR Data Science Summer School" for Aramco employees since 2019
+ Establishment of the joint Aramco-KFUPM Cybersecurity Chair agreement
+ Establishment of the department female undergraduate and graduate programs
+ Major Revision for the Computer Science undergraduate program
+ Major Revision for the Software Engineering undergraduate program
+ Awarded the ABET re-accreditation for Computer Science undergraduate program
+ Awarded the ABET re-accreditation for Software Engineering undergraduate program
+ Awarded the National Cybersecurity Authority education alignment certificate for the department Cybersecurity masters programs
+ Managed Projects with a total budget exceeding 4 Millions SAR.
+ Recruiting world class new faculty members (8 Graduate Assistants, 8 Assistant Professors, 4 Associate Professors, and 2 Professors)

Assistant Professor

Jan 2016 — Present	**King Fahd University of Petroleum and Minerals**, Saudi Arabia. *Information and Computer Science department* + ICS 103 Computer Programming in C + SWE 206 Introduction to Software Engineering + SWE 311 Principles of Software Engineering + SWE 316 Software Design and Architecture + SWE 411 Software Engineering Project I + SWE 412 Software Engineering Project II + ICS 500 Research Methods and Experiment Design in Computing + ICS 574 Big Data Analytics + ICS 557 Advanced Machine Learning

Judge

2019 - Now	**Mawhiba**, Riyadh, Saudi Arabia. Member of the judging committee for the National Olympiad for Scientific Creativity "Ibda'a". Area of specialization: Software and Robotics.

Summer Consultant

Summer 2018	**Saudi Aramco**, Dhahran, Saudi Arabia. *EXPEC Computer Center / Exploration Applications Services Dept / Applications Technology Division* Review current software development approach and methodology for software development for Exploration, and recommend improvements and best practices in quality, automation, integration and delivery.
Summer 2017	**Saudi Aramco**, Dhahran, Saudi Arabia. *Loss Prevention Department / Risk Assessment Group* SAP Environment, Health, Safety Management (EHSM) module upgrade for the Safety Recommendations System
Summer 2016	**Saudi Aramco**, Dhahran, Saudi Arabia. *EXPEC Computer Center/ Upstream Database Services Division* Predicting Electrical submersible pumps (ESP) failure using machine learning techniques

Teaching Assistant

Sept 2012 — Dec 2014	**University of Ottawa**, Canada. *School of Electrical Engineering and Computer Science* Prepared and Supervised laboratories. Marked quizzes and assignments. Provided feedback on students projects. Proctored exams. + ITI1120 Introduction to Computing I - Fall 2012 / Fall 2013 + ITI1121 Introduction to Computing II - Winter 2013 / Summer 2014 + SEG2105 Introduction to Software Engineering - Fall 2014 + SEG2106 Software Construction - Winter 2013 / Summer 2014

Full-Time Researcher

Jan 2010 – Dec 2015	**University of Ottawa**, Canada. *Complexity Reduction in Software Engineering (CRuiSE) group* Member of the CRuiSE research group under the supervision of Prof. Timothy Lethbridge. Conducted research on textual modeling languages and contributed to the development on the Umple language adopting these key practises: + Model-Driven Development (MDD) + Test-Driven Development (TDD) + Agile Development + Open source using svn/git + Documentation

Lecturer

July 2009 – Dec 2015	**King Fahd University of Petroleum and Minerals**, Saudi Arabia. *Information and Computer Science department* Prepared and given Lectures to undergraduate students on programming principles using Java. + ICS 102 Introduction to Computing I

Graduate Assistant

Nov 2006 – June 2009	**King Fahd University of Petroleum and Minerals**, Saudi Arabia. *Information and Computer Science department* Prepared and Supervised laboratories. Marked quizzes and assignments. Provided feedback on students projects. Proctored exams. + ICS 102 Introduction to Computing I + ICS 103 Computer Programming in C

Summer Intern

Summer 2005	**Saudi Aramco**, Dhahran, Saudi Arabia. *Integrated Solution Service Department (ISSD)* Developed and enhanced an image processing program in the ISSD.

Publications

Journals

[J14] S. Alsunaidi, **Hamoud Aljamaan**, and M. Hammoudeh, *"MultiTagging: A Vulnerable Smart Contract Labeling and Evaluation Framework"*, Electronics, 13.23 (2024): 4616.

[J13] **Hamoud Aljamaan**, *"Dynamic stacking ensemble for cross-language code smell detection"*, PeerJ Computer Science, 10:e2254, 2024.

[J12] A. Alazba, **Hamoud Aljamaan**, M. Alshayeb, *"CoRT: transformer-based code representations with self-supervision by predicting reserved words for code smell detection"* Empirical Software Engineering 29.3 (2024): 59.

[J11] A. Alazba, **Hamoud Aljamaan**, M. Alshayeb, *"Automated detection of class diagram smells using self-supervised learning"* Automated Software Engineering 31.1 (2024): 29.

[J10] A. Alqarni, **Hamoud Aljamaan**. *"Leveraging Ensemble Learning with Generative Adversarial Networks for Imbalanced Software Defects Prediction"* Applied Sciences 13.24 (2023): 13319.

[J9] N. Alturayeif, **Hamoud Aljamaan**, J. Hassine, *"An automated approach to aspect-based sentiment analysis of apps reviews using machine and deep learning"*. Automated Software Engineering 30(2), p.30, (2023).

[J8] R. Sandouka, **Hamoud Aljamaan**, *"Python code smells detection using conventional machine learning models*. PeerJ Computer Science 9:e1370, 2023.

[J7] A. Alazba, **Hamoud Aljamaan**, M. Alshayeb, *"Deep learning approaches for bad smell detection: a systematic literature review"*. Empirical Software Engineering 28, 77 (2023).

[J6] A. Alazba, **Hamoud Aljamaan**, *""Software Defect Prediction Using Stacking Generalization of Optimized Tree-Based Ensembles"*, Applied Sciences, vol. 12, no. 9, p. 4577, Apr. 2022.

[J5] K. E. Hoque, **Hamoud Aljamaan**, *"Impact of Hyperparameter Tuning on Machine Learning Models in Stock Price Forecasting"*, IEEE Access, vol. 9, pp. 163815-163830, 2021.

[J4] T. Lethbridge, **Hamoud Aljamaan**, et al. *"Umple: Model-driven development for open source and education"*, Science of Computer Programming, 208 (2021): 102665.

[J3] A. Alazba, **Hamoud Aljamaan**, *"Code Smell Detection using Feature Selection and Stacking Ensemble: An Empirical Investigation"*, Information and Software Technology (2021): 106648.

[J2] A. Al-Shaaby, **Hamoud Aljamaan**, M. Alshayeb, *"Bad Smell Detection Using Machine Learning Techniques: A Systematic Literature Review"*, Arabian Journal for Science and Engineering (2020) 45:2341–2369.

[J1] M. Elish, **Hamoud Aljamaan**, I. Ahmad, *"Three empirical studies on predicting software maintainability using ensemble methods"*, Soft Computing, 19(9): 2511-2524 (2015).

Conferences

[C16] N. Alsunaidi, S. Aljbali, Y. Yasin, **Hamoud Aljamaan**, *"Arabic Cyberbullying Detection Using Machine Learning: State of the Art Survey"*, Proceedings of the 27th International Conference on Evaluation and Assessment in Software Engineering (EASE '23), Oulu, Finland, 2023, pp 499-504.

[C15] D. Alomari, F. Anis, M. Alabdullatif, **Hamoud Aljamaan**, *"A survey on botnets attack detection utilizing machine and deep learning models"*, Proceedings of the 27th International Conference on Evaluation and Assessment in Software Engineering (EASE '23), Oulu, Finland, 2023, pp 493–498.

[C14] S. J. Alsunaidi, R. T. Alraddadi and **Hamoud Aljamaan**, *"Twitter Spam Accounts Detection Using Machine Learning Models,"* 2022 14th International Conference on Computational Intelligence and Communication Networks (CICN), Al-Khobar, Saudi Arabia, 2022, pp. 525-531.

[C13] **Hamoud Aljamaan**, *"Voting Heterogeneous Ensemble for Code Smell Detection"*, 20th IEEE International Conference on Machine Learning and Applications (ICMLA), Pasadena, CA, USA, 2021, pp. 897-902.

[C12] N. Alturaief, **Hamoud Aljamaan**, M. Baslyman, *"AWARE: Aspect-Based Sentiment Analysis Dataset of Apps Reviews for Requirements Elicitation"*, 35th IEEE/ACM International Conference on Automated Software Engineering Workshops (ASEW), Melbourne, Australia, 2021, pp. 211-218.

[C11] **Hamoud Aljamaan**, A. Alazba, *"Software Defect Prediction using Tree-based Ensembles"*, Proceedings of 16th ACM International Conference on Predictive Modeling in Software Engineering (PROMISE 20), Virtual, USA, 2020, pp. 1-10.

[C10] **Hamoud Aljamaan**, M. Garzón, T. C. Lethbridge, *"MOTL: a Textual Language for Trace Specification of State Machines and Associations"*, Proceedings of 25th Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, Canada, 2015, pp. 101–110.

[C9] **Hamoud Aljamaan**, M. Garzón, T. C. Lethbridge, A. Forward, *"UmpleRun: a Dynamic Analysis Tool for Textually Modeled State Machines using Umple"*, EXE@MoDELS, Ottawa, Canada, 2015, pp. 16-20.

[C8] M. Garzón, **Hamoud Aljamaan**, T. C. Lethbridge, *"Umple: A framework for Model Driven Development of Object-Oriented Systems"*, IEEE 22nd International Conference on Software Analysis, Evolution and Reengineering (SANER), Montreal, Canada, 2015, pp. 494-498.

[C7] M. Garzón, T. C. Lethbridge, **Hamoud Aljamaan**, O. Badreddin, *"Reverse engineering of object-*

oriented code into Umple using an incremental and rule-based approach", Proceedings of 24th Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, Canada, 2014, pp. 91-105.

[C6] **Hamoud Aljamaan**, T. C. Lethbridge, O. Badreddin, G. Guest, A. Forward, *"Specifying Trace Directives for UML Attributes and State Machines"*, 2nd International Conference on Model-Driven Engineering and Software Development (MODELSWARD), Lisbon, Portugal, 2014, pp. 79-86.

[C5] O. Badreddin, T. C. Lethbridge, A. Forward, M. Elaasar, **Hamoud Aljamaan**, M. Garzón, *"Enhanced Code Generation from UML Composite State Machines"*, 2nd International Conference on Model-Driven Engineering and Software Development (MODELSWARD), Lisbon, Portugal, 2014, pp. 235-245.

[C4] V. Abdelzad, **Hamoud Aljamaan**, O. Adesina, M. Garzón, T. Lethbridge, *"A Model-Driven Solution for Financial Data Representation Expressed in FIXML"*, TCC@STAF 2014, pp. 65-70.

[C3] **Hamoud Aljamaan**, M. Elish, I. Ahmad, *"An Ensemble of Computational Intelligence Models for Software Maintenance Effort Prediction"*, Advances in Computational Intelligence, IWANN (1) 2013, pp. 592-603.

[C2] **Hamoud Aljamaan**, T. C. Lethbridge, *"Towards Tracing at the Model Level"*, 19th Working Conference on Reverse Engineering (WCRE), Kingston, Canada, 2012, pp. 495-498.

[C1] **Hamoud Aljamaan**, M. Elish, *"An empirical study of bagging and boosting ensembles for identifying faulty classes in object-oriented software"*, IEEE Symposium on Computational Intelligence and Data Mining (CIDM), Nashville, USA, 2009, pp. 187-194.

Projects

Completed | **Umple: a model oriented programming language**
CRuISE, University of Ottawa, Canada
Umple is a technology for adding UML constructs to languages such as Java and PHP. It can also be used for pure modelling, or can be seen as a textual representation of UML in which you can embed code from other languages. It generates state of the art code for state diagrams and class diagrams, and is fully open source.

Completed | **MOTL: a model oriented tracing language**
CRuISE, University of Ottawa, Canada
MOTL is a textual model-level tracing language, implemented as part of Umple, that operates at the model level to allow trace specification of textually modeled UML constructs. MOTL allows tracing of UML associations, attributes and state machines. Constraints can be imposed to limit the scope of tracing.

2008 | **School Information System**
Research Institute, KFUPM, Saudi Arabia
Requested by *Ministry of Education, Saudi Arabia*
Team Member - Developed a Software Requirement Specification (SRS) for an online School Management System and Teacher Affairs System for the Ministry of Education, Saudi Arabia.

Skills

Programming:	Python, Java, C/C++, MATLAB, ASSEMBLY
Machine learning:	Scikit-learn, Weka
Software Development:	UML2, Umple, MDD, TDD, JET, Xtend, Xpand, Junit, ANTLR
Web Development:	PHP, HTML, XML
Tracing Tools:	log4j2, Java Logging framework, LTTng
DataBase:	MySQL, Oracle
Data Analysis:	R language, STATISTICA
Software Version Control:	SVN, GIT
Operating Systems:	LINUX/UNIX, Mac OS, Windows
IDE & Editors:	Google Colab, Jupyter notebook, eclipse 4.x, LaTeX

Research Funding

2020 - 2024 | **Saudi Aramco**
EXTERNAL PROJECT
Project Title: Researching Upstream Challenges through 4IR Summer School
Role: Cost Center Manager, Member
Project number: ICS-2506
Duration: 4 years
Budget: SR 2.5M

2019 | **Saudi Aramco**
EXTERNAL PROJECT
Project Title: Studying the feasibility of establishing 4IR Summer School
Role: Cost Center Manager, Member
Project number: ICS-2468
Duration: 1 year
Budget: SR 560,000

2018 | **King Fahd University of Petroleum and Minerals (KFUPM)**
START UP RESEARCH GRANT
Project Title: Software Maintainability Prediction using Hybrid Data Mining Prediction Models.
Role: PI
Project number: SR 171014
Duration: 11 months
Budget: SR 60,500

2008 | **King Abdulaziz City for Science and Technology (KACST)**
MASTER THESIS FUNDING
Project Title: Software Quality Assessment using Ensemble Models.
Role: PI
Project number: GSP-17-132
Duration: 1 year
Budget: SR 50,000

Thesis Supervision

- **[Ongoing]** Shikah Alsunaidi, PhD in Computer Science.
- **[Ongoing]** Rana Baamer, Msc in Computer Science.

- **[Ongoing]** Raghad Alzahrani, Msc in Computer Science.
- **[Ongoing]** Rana Sandouka, Msc in Computer Science.
- **[Completed]** Amal Alazba, PhD in Computer Science, Dec 2023.
  - Thesis title: "A Framework for Software Code and Model Smell Detection through Self Supervised Learning".
- **[Completed]** Amani Alqarni, Msc in Computer Science, Dec 2023.
  - Thesis title: "Leveraging Ensemble Learning with Generative Adversarial Networks in Imbalanced Software Defects Prediction".
- **[Completed]** Lama Albakhat, Msc in Computer Science, May 2022.
  - Thesis title: "Robustness And Stability Analyses Of Ensemble Learning Models In Android Malware Detection".
- **[Completed]** Nouf Alturayeif, Msc in Computer Science, Dec 2021.
  - Thesis title: "Aspect-Based Sentiment Analysis of Apps Reviews Using Supervised Machine Learning".
- **[Completed]** Kazi Ekramul Hoque, Msc in Computer Science, Dec 2021.
  - Thesis title: "Hyperparameter Tuning Impact on Machine Learning Forecasting Performance within the Saudi Stock Market".
- **[Completed]** Ahmed Alshaaby, Msc in Software Engineering, Dec 2019.
  - Thesis title: "Software Bad Smells Prediction Using Advanced Machine Learning Techniques".

Awards

- Supervised the team that won the Best Software Engineering Senior Design Project award for the project "Qulab" at the SDP Expo, King Fahd University of Petroleum and Minerals, 2023. *Role: Supervisor*
- Led the delegation of the team that ranked 2nd among 51 teams at the Gulf Programming Competition, Muscat, Oman, 2022. *Role: Delegation Head*
- Received the National Cybersecurity Authority (NCA) Education Alignment Certificate for the department's Cybersecurity Master's programs, 2022. *Role: Chairman*
- Secured ABET re-accreditation for the BSc Computer Science program, 2021. *Role: Chairman*
- Secured ABET re-accreditation for the BSc Software Engineering program, 2021. *Role: Chairman*
- Received the University Service Award for 10 years of service at King Fahd University of Petroleum and Minerals, 2016.
- Awarded University of Ottawa travel grants: (2010–2012) École Polytechnique de Montréal, Montréal, Canada; (2012) CSER, Victoria, Canada; (2014) MODELSWARD, Lisbon, Portugal.
- Received Saudi Arabian Cultural Bureau (SACB) Excellence Awards: Fall 2012, Winter 2014, Winter 2015, Fall 2015.
- Awarded PhD scholarship from the Ministry of Higher Education, Saudi Arabia, 2010.
- Received Saudi Telecom Company (STC) award for top ten graduate students at King Fahd University of Petroleum and Minerals, 2008.
- Received Outstanding Graduate Academic Performance Award, King Fahd University of Petroleum and Minerals, 2008.
- Graduated with Second Class Honors, King Saud University, 2006.

Volunteer activities

- Local organizer / Student volunteer - ACM/IEEE 18th International Conference on Model Driven Engineering Languages and Systems (MoDELS'15).
- President - Saudi Student Association at the University of Ottawa (uOttawa), 2012.
- Member - Saudi Club in Ottawa, 2010 - 2013. Participated in organizing many soccer tournaments for the Saudi Club in Ottawa.

Research Interests

- AI for Software Engineering
- Software Quality
- Ensemble Learning
- Time series analysis

Languages

Arabic: Mothertongue
English: Fluent