

# Hamzeh Eyal Salman

Associate Professor, Ph.D.

## Personal Information

- **Nationality:** Jordanian
- **Marital Status:** Married
- **Gender:** Male
- **Date of Birth:** July 12, 1984
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- **Address:** SE Dept., IT Faculty, Mutah University, Al-Karak, Jordan
- **Google Scholar Profile:** [Link of Google Scholar](#)
- **Scopus Author ID:** 55596289700
- **ORCID:** <https://orcid.org/0000-0003-3258-7304>
- **Research Gate Profile:** [Link of Research Gate](#)
- **Linkedin Profile:** [Link of Linkedin](#)



## Education

- **University of Montpellier 2** France, On  
*Ph.D. Computer Science / Specialization Software Engineering* 2011 - 2014
  - **Thesis Title:** Recovering Traceability Links between Artifacts of Software Variants in the Context of Software Product Line Engineering.
  - **Supervisors:** [Prof. Christoph Dony](#) and [Prof. Abdelhak-Djamel Seriai](#)
- **University of Jordan** Jordan, On  
*M.Sc. Computer Science / Specialization Software Engineering* 2007 - 2010
  - **Thesis Title:** Using Genetic Algorithms in Test Data Generation for ORACLE Named Block.
  - **Supervisors:** [Prof. Mohammad Alshraideh](#) and [Prof. Basel Mahafzah](#)
  - **Graduated with GPA (3.50 out of 4.0)**
  - **Rating:** Very Good
- **Al-Hussein Bin Talal University** Jordan, On  
*B.Sc. Computer Information Systems* 2002 - 2006
  - **Undergraduate Project:** TOEFL On-line Exam using ORACLE 9i

- Graduated with GPA 86.81%
- Rating: Excellent

## Philosophy Statement for Research

Scientific research is a main duty of each academic staff member along with the teaching side. It is a way for innovative and development. I always ask my students in graduate courses to conduct a research work as an important requirement to pass the course. I teach them how to write scientific article step-by-step and how to present it. My goal is to help them to write and publish their research results in reputable international conferences and journals. It is important for me to encourage them to solve challenging problems that lead to use generic research tools for asking and answering research questions and building algorithms and heuristics. I prefer to guide graduate students to work on a research problem that is a part of running research projects. This helps them to have the opportunity to conduct research collaboration with other researchers and to know how to integrate their work with the others' work.

## Philosophy Statement for Teaching

Talking to minds is not an easy job. I believe that linking theoretical part with practical part is very important to tackle this issue and giving an illustrative example to clarify any concept helps to mitigate this issue. I always links theoretical concepts to their applications in relevant domain or real industrial situations. Over the past ten years, I enjoy transferring my knowledge and skills to my students through modern teaching strategies to achieve course-learning outcomes. I see these learning outcomes like an ethical contract between class students and their instructor. I taught and worked with my students as instructor, undergraduate project and research supervisor and M.Sc. thesis supervisor. I always motivate my students to work as a team to solve problems that they face in their professional life and encourage them to use online material to deeply understand technical details.

## Research Experience

- Research Visitor                                  University of Montpellier 2/ LIRMM Lab-France.  
1/2020-6/2020
- Doctoral Research                                University of Montpellier 2/ LIRMM Lab-France.  
2011 - 2014  
 Supporting reverse engineering software product variants into software product line.
- Master Research                                    University of Jordan-Jordan  
2009 - 2010  
 Generating test data to coverage named block in ORACLE by using genetic algorithms (GAs) according to branch criteria.

- **Research Interests**

- Software engineering.
- Software product line engineering.
- Software architectures and components.
- Software reuse, understanding and maintenance.
- Re-engineering, reverse engineering and refactoring.
- Program analysis: static and dynamic.
- Feature location and identification.
- Microservice identification.
- Change impact analysis.
- Software testing.
- APIs and software libraries: reusability and usability.
- Mining software repositories.
- Machine learning applications in software engineering.
- Search-based software engineering.

## Academic Experience

- **Associate Professor** **Mutah University-Jordan**  
*2019-Present*  
Computer Information Systems, Mutah University, October 2, 2019 till present.
- **Assistant Professor** **Mutah University-Jordan**  
*2015 - 2019*  
Computer Information Systems, Mutah University, March 16, 2015 till October 1, 2019.
- **Full Time Lecturer** **Mutah University-Jordan**  
*2014 - 2015*  
Computer Information Systems, Mutah University, September 22, 2014 till March 15, 2015.

## Teaching Experience

- **Master Level Courses** **Mutah University-Jordan**  
*2016-Present*
  - Advanced Software Engineering Course
  - Advanced Databases Systems Course
  - Research Project Course

- **Bachelor Level Courses**

Mutah University-Jordan  
*2014-Present*

- Software Engineering Course
- Software Architecture and Design Course
- Software Testing Course
- Systems Analysis and Design Course
- Object-Oriented Programming Course
- Data Structures Course
- Database Management Systems Course
- Introduction to Information Technology Course
- Computer Security Course
- Scientific Writing and Communication Skills Course
- Computer Skills Course

- **More Courses Able to Teach (Undergraduate & Graduate)**

- Requirements Engineering.
- Machine Learning.
- Artificial Intelligence.
- Computation Intelligence.
- Image Processing.
- Computer Networking.
- Parallel and Distributed Computing.
- Computer Algorithms.
- Operating Systems.
- E-Commerce.
- Internet Programming.

- **Teaching the Following Computer Labs.**

Tafila Technical University-Jordan  
*2008 - 2011*

- Object-Oriented Programming Lab.
- C++ Programming Lab.
- SQL Programming Lab.
- Visual Basic Programming Lab.
- HTML Programming Lab.
- Computer Skills Lab.

- **Teacher at High School**

Jordanian Education Ministry  
*2006 - 2008*

**Positions Held**

- Assistant Dean of Information Technology Faculty. Mutah University-Jordan  
*2016-2017*
- Chair of Information Technology Department. Mutah University-Jordan  
*2017-2018*
- Chair of Computer Science Department. Mutah University-Jordan  
*2018-2020*
- Permanent Member in Computer Information Systems. Mutah University-Jordan  
*2014-Present*

## Honours

- A full degree Erasmus Mundus Ph.D. scholarship, University of Montpellier, France, September 2011 to July 2014.
- Ranked 1st in Bachelor degree in Computer Information System, University of Al-Hussein Bin Talal, Jordan, 2006.
- Outstanding student scholarship, Ministry of Higher Education and Scientific Research, Jordan, September 2003 to June 2006.

## Academic Committee Membership

- **The Mutah University**, University Committees
  - Member of Computerized Examination Committee.
  - Member of the Higher Studies Board.
- **Mutah University**, Faculty Committees
  - Chair of the Quality Assurance Committee.
  - Chair of the Scientific Research Committee.
  - Member of the E-Learning Committee.
  - Member of the Faculty Board.
  - Member of the Field Training Committee.
  - Member of the Higher Studies Committee.
  - Member of the Faculty Scientific Day Committee.
- **Mutah University**, Department Committees
  - Chair of the Department Board.
  - Chair of the Higher Studies Committee.
  - Chair of the Quality Assurance Committee.
  - Chair of the Courses Schedule Committee.

- Member of the Department Board.
- Member of the Comprehensive Examination Committee for M.Sc. Students.
- Member of the Scientific Research Committee.
- Member of the Appointment and Promotion Committee.
- Member of the Graduation Projects Committee.
- Member of the M.Sc. Thesis Examination Committees.
- Member of the Courses Equalization Committee for Transferred Students.
- Member of the Curriculum Plan Committee.
- Member of the Students Union Election Supervision Committee.

## Graduate Students Supervision

- **M.Sc Thesis - Main Supervision - Ongoing**

- 1- Nagam Ma'ateh, "*A Parametrized Approach for Commonality and Variability Analysis in Github's Forks toward Software Product Line Engineering*", Computer Science Department, Mutah University, Al-Karak-Jordan, 2020.
- 2- Yageen Ma'ateh, "*Feature Interaction Prediction in Software Product Line Engineering*", Computer Science Department, Mutah University, Al-Karak-Jordan, 2020.

- **M.Sc Thesis - Co-Supervision - Ongoing**

- 1- Roaa Ma'ae'h, "*Highly Secure Wireless Network by Detecting of Rogue Access Points and Preventing Cloning of Legitimate Access Point*", Computer Science Department, Mutah University, Al-Karak-Jordan, 2021.
- 2- Abo-Baker Al-Taie, "*Predict Quality Medical Drug Data Toward Meaningful Data Using AI Algorithms*", Computer Science Department, Mutah University, Al-Karak-Jordan, 2021.

## M.Sc. Thesis-Examination Committee Membership

- **Internal Examiner**

- 1- Suzan Alasasfeh, "*Machine Learning Based Emotion Recognition System Using EEG Signals*", Computer Science Department, Mutah University, Al-Karak-Jordan, 2020.
- 2- Sohyb Al-qbailat, "*Jordan Birds Recognition System Using Deep learning*", Computer Science Department, Mutah University Al-Karak-Jordan, 2020.
- 3- Rami Al-Naimat, "*Step Detection, Distance Estimation and Noise Segmentation using Smartphone Sensor Data*", Computer Science Department, Mutah University Al-Karak-Jordan, 2019.
- 4- Shorouq Al-Tarawneh, "*Intelligent Academic Content Recommender System*", Computer Science Department, Mutah University Al-Karak-Jordan, 2019.

- 5- Ameen Al-Misedeen, “*Reduction of Power Consumption in Wireless by Improving IEEE802.1 Protocol*”, Computer Science Department, Mutah University Al-Karak-Jordan, 2018.
- 6- Omamah Al-Thnebat, “*Smart Classroom Approach for Automatic Evaluation of Students Grade*”, Computer Science Department, Mutah University Al-Karak-Jordan, 2018.
- 7- Batool Al-Horani, “*A Smart Classroom Based Approach for Detecting the Appropriate Document for a Spoken Word*” , Computer Science Department, Mutah University Al-Karak-Jordan, 2018.
- 8- Boshrah Al-Saraerah, “*Enhanced Event Detection Scheme in Wireless Actor Network using Dragonfly Algorithm*”, Computer Science Department, Mutah University Al-Karak-Jordan, 2018.

- **External Examiner**

- 1- Obadah Shatnawi, “*A Parameterized Approach for Analyzing Source Code Variability in Cloned Java Software Variants*”, Computer Science Department, Jordan University of Science and Technology, Irbid – Jordan, 2020.

## Reviewing Activities

- **Reviewer for the Following Journal:**

- International Journal of Software Engineering and Knowledge Engineering, Singapore.
- Information and Software Technology Journal - Elsevier, Netherlands
- Mutah Lil-Buhuth Wad-Dirasat, Natural and Applied Sciences Series, Jordan.

- **Reviewer for the Following Conferences:**

- International Conference on Information and Communication Systems [ICICS 2019], June 11-13, 2019 - Irbid -Jordan, <http://www.just.edu.jo/icics/icics2019/>

- **Research Projects Reviewer:**

- Facilitating IPsec tunnel endpoint management for the hybrid cloud environments using large scale IPsec deployments, Ajman University, Emirates, August 2018.
- Network virtualization for supporting task offloading across hybrid cloud infrastructures, Ajman University, Emirates, August 2018.

## Projects

- **Title: Recovering Traceability Links between Artifacts of Software Variants in the Context of Software Product Line Engineering**

- **Position Held:** Ph.D Researcher.
- **Funded by:** Erasmus Mundus Action 2 – JOSYLEEM.

- **Amount:** 52,200 Euro.
- **Organization:** LIRMM Laboratory, University of Montpellier, Montpellier, France.
- **Co-Workers:** Prof. Abdelhak Seriai and Prof. Christophe Dony.
- **Duration:** November 20, 2011 - June 17, 2014.

## Attended Conferences

- MODELS 2012 conference/ September. 30th - October. 5th, 2012 - Innsbruck, AUSTRIA
- CAL conference/ May 30-31, 2012 - Montpellier, France
- CSMR 2013 conference/ March 5-8, 2013 - Genova, Italy
- IRI 2013 conference/ August 14-16, 2013 - San Francisco, USA
- Co-located conferences ECOOP, ECSA, ECMFA/ July 1-5, 2013 - Montpellier, France
- AICCSA 2018 conference/ October 28th to November 1st, 2018 - Aqaba, Jordan.

## Program and Organization Committee

- Program committee member of the international symposium on software engineering for cloud, edge and internet of things systems, [SECEI 2020](#)
- Program committee member advances in Software Engineering Track, 15th ACS/IEEE international conference on computer systems and applications, [AICCSA 2018](#)
- Organization committee member of CAL Conference 2012, [CAL2012](#)
- Organization committee member of Co-located conferences, [ECOOP/ECSA/ECMFA2013](#)

## Personal Skills & Training

- Technical Skills
  - Excellent in program analysis; static and dynamic analysis.
  - Deploying Formal Concept Analysis (FCA)/research technique.
  - Deploying Information Retrieval (IR) for software understanding.
  - Deploying multiple machine learning techniques to solve different research problems.
  - Familiar with Eclipse.
- Programming Languages
  - **Intermediate:** Python, C++, JAVA, ORACLE 9i, ORACLE 10g, HTML, ASP.Net, MATLAB and SQL PLUS.



- Application Software
  - **Expert:** MS Access, MS Excel, MS Word and MS Power Point, Microsoft Teams and Zoom.
  - **Intermediate:** Rational Rose, Visual Paradigms for UML, ERCA and Smart Draw.
  - Familiarity with Learning Management Systems.
- System Software
  - **Expert:** Windows XP, Windows Vista, Windows 7, Windows 10
  - **Intermediate:** Windows server 2003
- Languages
  - **Arabic:** Native.
  - **English:** Proficient.
  - **French:** Basic Knowledge.
- Training
  - LaTeX: 20 Credit Hours
  - How to write a scientific paper step by step: 20 Credit Hours
  - Preparing a research project and taking notes on scientific literature: 20 Credit Hours
  - ICDL certificate, Syllabus Version 4.0
  - CCNA course
  - MCP course
  - ERFKE certificate: 48 Credit Hours
  - Quality Assurance Training

## Publications

- Book
  - **Hamzeh Eyal-Salman**, Abdelhak-Djamel Seriai . *Supporting Reengineering Software Variants into Software Product Lines: Recovering Traceability Links between Software Artifacts*, LAP LAMBERT Academic Publishing, 2014.
- International Journals
  - **Hamzeh Eyal Salman**, Zakarea Al-Shara. “Automatic Identification of Similar Pull-Requests in GitHub’s Repositories Using Machine Learning”. Submitted to Journal of Software and Systems (Elsevier Journal), 2021.
  - **Hamzeh Eyal Salman**. “Feature-based Insight for Forks in Social Coding Platforms”. Information and Software Technology Journal (Elsevier Journal), Vol. 140, 2021
  - Ahmad B. A. Hassanat, Haneen Arafat Abu Alfeilat, Omar Lasassmeh, Ahmad S Tarawneh, M. Bashir Alhasanat **Hamzeh Eyal Salman**, V. B. Surya Prasath. *Effects of Distance Measure Choice on KNN Classifier Performance - A Review*. Big Data Journal, Vol.7, No. 3, 2019.

- **Hamzeh Eyal Salman**, Mustafa Hammad, Abdelhak-Djamel Seriai, Ahed Al-Sbou. “*Semantic Clustering of Functional Requirements Using Agglomerative Hierarchical Clustering*”. , 2018, 9(9), 222.
  - **Hamzeh Eyal Salman**. “*API Library-Based Identification and Documentation of Frequent Usage Patterns*”. International Journal of Computer Applications in Technology, IJCAT, 2017, vol. 58, no. 1, pp. 63–79, Jan. 2018
  - **Hamzeh Eyal Salman**. “*Identification multi-level frequent usage patterns from APIs*”. Journal of Systems and Software (Elsevier Journal) , JSS, 2017, 130, pp.42-56. Information Journal, MDPI
  - **Hamzeh Eyal Salman**, Abdelhak-Djamel Seriai, Mustafa Hammad. “*Quality-driven feature identification and documentation from source code*”. Journal of Theoretical and Applied Information Technology, JATIT, 2016, 84 (2), pp.183-195.
  - **Hamzeh Eyal Salman**, Abdelhak-Djamel Seriai, Christophe Dony. *Feature-Level Change Impact Analysis Using Formal Concept Analysis*. International Journal of Software Engineering and Knowledge Engineering 25(1): 69-92, 2015.
  - M. Alshraideh, B. Mahafzah, **H. Eyal-Salman** and I. Salah, *Using Genetic Algorithm as Test Data Generator for Stored PL/SQL Program Units*. Journal of Software Engineering and Applications, Vol. 6 No. 2, 2013, pp. 65-73.
- International Conferences
    - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai and Christophe Dony. *Feature-to-Code Traceability in Legacy Software variants*.39th Euromicro Conference on Software Engineering and Advanced Applications, SEAA 2013, Santander, Spai, September 4-6, 2013. IEEE Computer Society 2013.
    - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai and Christophe Dony. *Feature-to-Code Traceability in a Collection of Software Variants: Combining Formal Concept Analysis and Information Retrieval*. IEEE 14th International Conference on Information Reuse & Integration, IRI 2013, Las Vegas, NV, USA, August 14-16, 2013.
    - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai and Christophe Dony. *Feature-Level Change Impact Analysis Using Formal Concept Analysis*. Software Engineering and Knowledge Engineering (SEKE’26), 2014 .
    - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai and Christophe Dony. *Feature Location in a Collection of Product Variants: Combining Information Retrieval and Hierarchical Clustering*. Software Engineering and Knowledge Engineering (SEKE’26), 2014 .
    - AL-MSIE’DEEN R., SERIAI A. D., HUCHARD M., URTADO C., VAUTTIER S., **SALMAN H. E.**, *Mining Features from the Object-Oriented Source Code of a Collection of Software Variants Using Formal Concept Analysis and Latent Semantic Indexing*, Proceedings of the The 25th International Conference on Software Engineering and Knowledge Engineering, USA, 2013.
    - AL-MSIE’DEEN R., SERIAI A. D., HUCHARD M., URTADO C., VAUTTIER S., **SALMAN H. E.**, *Feature location in a collection of software product variants using formal concept analysis*, Proceedings of the 13th International Conference on Software Reuse - Safe and Secure Reuse”, ICSR 2013, Springer, Italy.

- International Workshops
  - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai, Christophe Dony and Ra’Fat Al-Msie’Deen. *Identifying Traceability Links between Product Variants and Their Features*. 1st International Workshop on Reverse Variability Engineering (REVE 2013), CSMR 2013 , 5th March 2013 , 2013 - Genova, Italy
  - **Hamzeh Eyal-Salman**, Abdelhak-Djamal Seriai, Christophe Dony and Ra’Fat Al-Msie’Deen. *Recovering Traceability links between Feature Models and Source Code of Product Variants*. ACM VARY Workshop (VARY: VARIability for You), MODELS 2012, Sept. 30th - Oct. 5th, 2012 - Innsbruck, Austria.
- National Conferences
  - **Hamzeh Eyal-Salman**, Abdelhak Seriai, Christophe Dony and Ra’Fat Al-Msie’Deen. *Genetic Algorithms as Recovering Traceability Links Method between Feature Models and Source Code of Product Variants*. Lille - France, 6 novembre 2012. Product Line Day, 2012.
  - **Hamzeh Eyal-Salman**, Abdelhak Seriai, Christophe Dony and Ra’Fat Al-Msie’Deen *Identifying Traceability between Feature Model and Source Code in a Collection of Product Variants*. Workday Group RIMEL LPG Nîmes, December 17, 2012.
  - Ra’Fat Al-Msie’Deen, Abdelhak Seriai, Marianne Huchard, Christelle Urtado, Sylvain Vauttier and **Hamzeh Eyal Salman**. *An approach to recover feature models from object-oriented source code*. Lille - France, 6 novembre 2012. Product Line Day, 2012.
- Doctoral Symposium
  - **Hamzeh Eyal-Salman**. *Toward Reengineering Legacy Software Variants into Software Product Line: Feature-to-Code Traceability*, ECOOP conference 2013, France, Montpellier

## References

- Prof. Christoph Dony at University of Montpellier II, France (Dony@lirmm.fr)
- Prof. Abdelhak-Djamel Seriai at University of Montpellier II, France (seriai@lirmm.fr)
- Prof. Marianne Huchard at University of Montpellier II, France (huchard@lirmm.fr)
- Prof. Mohammad Alshraideh at University of Jordan, Jordan (mshridah@ju.edu.jo)
- Prof. Basel Mahafzah at University of Jordan, Jordan (b.mahafzah@ju.edu.jo)

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