



Fellow	Güler <b>Kalem</b>
Host Organisation	UMA - ITIS (University of Malaga - Institute of Software Technologies and Engineering), Malaga, Spain
Scientific coordinator	Prof. Dr. José Francisco <b>Aldana Montes</b>



## I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

My fellowship in UMA-ITIS was highly productive since the insights and feedback gained during this period was very valuable for my research. I am very grateful and many thanks to my scientific coordinator Prof. Dr. José Francisco Aldana Montes and his research group for this opportunity.

The scientific activity during my fellowship can be summarized as follows;

- I explored the feasibility of integrating the research within the scope of Human Activity Recognition (HAR) to classify human activities in real time using the sensors of accelerometer and gyroscope, and Semantic Web. I tried different machine learning algorithms and compare the performances with different aspects in different datasets. In addition to this, I had experience in exploring the combination of semantics (Ontologies and Knowledge Graphs) with HAR algorithms to improve their results, and injecting domain knowledge into the algorithms. This allowed me to examine various aspects where AI and Semantic Web can converge to increase the efficiency.
- I analyzed the dataset of older adults performing exercise number 10 of the Berg Balance Scale on a Wii Balance Board, along with the ground truth of the Berg scores provided by a medical specialist. The goal is fully characterize the movement and identify the main features (spatial and temporal, which are already computed and included in the dataset) that most strongly correlate with the user's Berg Balance Score.

## II – PUBLICATION(S) DURING YOUR FELLOWSHIP

- In progress: Real time housework activity recognition and increasing performance with Semantic Web
- In progress: Berg Scale exercise analysis for fully characterization the movement and identification of the main features
- G. KALEM, D. I. URAL, E. ÖZÇELİK, K. YILDIRIM (2024), "Comparison of Automated and Manual Software Testing Techniques: A Systematic Literature Review", 6th International Conference on Artificial Intelligence and Applied Mathematics in Engineering (ICAIAME 2024), Warsaw, Poland, September 26-28, 2024.



### III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

- Speaker (Poster presentation) - 4th ERCIM FP Community Event, online event via Gather Town. Date: November 8th, 2024.
- Speaker - I attended "*6th International Conference on Artificial Intelligence and Applied Mathematics in Engineering (ICAIAME 2024)*" with a conference paper entitled "Comparison of Automated and Manual Software Testing Techniques: A Systematic Literature Review" in Warsaw, Poland. Date: September 26-28, 2024.
- Participant - ERCIM 2024 Spring Meetings are hosted by ITIS Software - University of Malaga in Malaga, Spain. Date: May 22th, 2024.
- Speaker - I attended the "1st ITIS QUALIFICA PROJECT WORKSHOP" on November 28th, 2023 with a presentation entitled "Human Activity Recognition" in the "Data Science and Engineering" session in Malaga, Spain.
- Participant - 3rd ERCIM FP Community Event, online event via Gather Town. Date: November 8th, 2023.

### IV – RESEARCH EXCHANGE PROGRAMME (REP)

For Research Exchange Programme (REP), I had the opportunity to visit the institute of National Research Council (CNR), Institute of Information Science and Technologies (ISTI) in Pisa, Italy in between the dates of September 9th-13th, 2024. Prof. Dr. Filippo Palumbo welcomed me and I had a chance to discuss possible future research topics with him. During my visit to CNR, he mentioned me about his projects, the collected datasets and possible collaboration ideas that can be done in the near future.



## V – SUM UP OF THE FINAL SCIENTIFIC REPORT FOR THE ERCIM NEWSLETTER

Overall, the ERCIM Fellowship Programme was very beneficial for my research career. I gained diverse experience in different aspects. During my fellowship, I was at UMA - ITIS (University of Malaga - Institute of Software Technologies and Engineering), Malaga, Spain. My fellowship was highly productive and valuable for my research.

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During my fellowship, following scientific activities performed;

- I explored the feasibility of integrating the research within the scope of Human Activity Recognition (HAR) to classify human activities in real time using the sensors, and Semantic Web. Additionally, I had experience in exploring the combination of semantics (Ontologies and Knowledge Graphs) with HAR algorithms to improve their results.
- I analyzed the dataset of older adults performing exercise number 10 of the Berg Balance Scale on a Wii Balance Board, along with the ground truth of the Berg scores provided by a medical specialist. The goal is fully characterize the movement and identify the main features (spatial and temporal, which are already computed and included in the dataset) that most strongly correlate with the user's Berg Balance Score.
- For Research Exchange Programme (REP), I had the opportunity to visit the institute of National Research Council (CNR), Institute of Information Science and Technologies (ISTI) in Pisa, Italy in between the dates of September 9th-13th, 2024.

Bio:

Dr. Güler KALEM received her B.Sc. and M.Sc degrees from the Computer Engineering Department of Atılım University in 2003 and 2005, respectively. She studied at Medical Informatics Department of METU for her Ph.D studies. Later, she received her Ph.D degree from the Software Engineering Department of Atılım University in 2017. She is currently working as an Asst. Prof. Dr. at the Department of Software Engineering, Atılım University, Ankara, Turkey. Her research interests include medical informatics, information systems, healthcare/mobile technologies, reasoning systems and the semantic web technologies. To know more, please contact via: gulerkalem@gmail.com, Linked-in: <https://www.linkedin.com/in/güler-kalem-phd-2b47851a/>