

Report on Visit to University of Lorraine, France under SAFE-RH Project

From July 7th to July 16th, 2024, I had the opportunity to visit the University of Lorraine in France as part of the Erasmus Plus Project. This visit focused on research and development related to the SAFE-RH project, particularly on the fall detection model using wrist-worn sensors.

During my visit, I worked closely with Professor Dr. Hassan Rabbah, a well-respected researcher in the field. Our discussions revolved around the challenges of using wrist-worn sensors for fall detection. One of the primary issues we explored was the complexity of wrist movements in daily activities, which often leads to high false-positive rates in fall detection. The difficulty arises because wrist movements, even during non-critical tasks, can mimic the patterns of a fall, causing inaccurate detections. A significant part of this collaboration involved the Institut Jean Lamour (IJL), a leading research institute within the University of Lorraine. IJL specializes in materials science, nanotechnology, and energy, and their expertise was particularly valuable in exploring the hardware challenges associated with wrist-worn sensors. Dr. Rabbah and his team suggested potential solutions to tackle this issue. We discussed optimizing the sensor fusion technique by combining data from accelerometers and gyroscopes in a way that could better differentiate between regular activities and actual falls. Additionally, Dr. Rabbah emphasized the need for more precise signal processing algorithms that could filter out noise and irregular wrist movements that do not indicate a fall.



Over the next few days, I worked with Dr. Rabbah's team in the laboratory to implement some of these ideas. We ran multiple experiments, testing different threshold levels and machine learning models to improve the system's accuracy. This hands-on lab work provided me with valuable experience in analyzing sensor data, refining algorithms, and adjusting the parameters to achieve more reliable fall detection results.



In addition to the research activities, I took some time to explore the local culture. I visited Paris and saw the iconic Eiffel Tower, experiencing the rich history and beauty of the city. These cultural experiences, combined with my work at the University of Lorraine, made the trip both professionally and personally rewarding.

By the end of my visit, we had made significant progress in improving the fall detection system. The collaboration with Dr. Rabbah and his team provided a deeper understanding of the challenges and led to valuable advancements in my research. I am grateful for the opportunity provided by the SAFE-RH Project and for the support from both Professor Dr. Hassan Rabbah and the University of Lorraine. This visit has been instrumental in advancing my research and expanding my professional network in the field of remote health monitoring.

