



Dear Madam or Sir,

I am writing this letter of recommendation for Mrs. Joumana Makki, a bachelor student in my group at the Department of Computer Science at the Islamic University of Lebanon. Mrs. Makki is an outstanding student with a passion for artificial intelligence and a proven track record of academic excellence.

During the Artificial Intelligence course, I had the pleasure of supervising Mrs. Makki's work, and I am proud to say that she achieved an "excellent" grade. Throughout the course, Mrs. Makki implemented multiple AI projects, including computer vision, image processing, medical imaging, data cleaning and processing, classification, and clustering.

I would like to highlight some of the specific achievements that Mrs. Makki accomplished during the course:

Firstly, she combined multiple images of the same scene taken at different exposure levels to produce a single image with improved dynamic range and overall image quality. Mrs. Makki used alignMTb to align images, calculated the CFR, merged the images using cv2 library from openCV library, and performed some Tone Mapping using three methods (Dragon's method, Reinhard's method, and Mantiuk's method).

Secondly, she calculated the distance between 2 objects in an image using the openCV library. She achieved this by edging the image and finding its contours, then initializing the distance colors and reference object to individually iterate through the contours. Finally, she looped over the original points.

Thirdly, she applied several supervised Machine Learning techniques, such as Decision Tree, Random Forest, K-Nearest Neighbor, Support Vector Machines, Naive Bayes, and Logistic Regression, to the mammography dataset. Mrs. Makki evaluated which algorithm yields the highest accuracy as measured with K-Fold cross-validation.

Mrs. Makki also demonstrated excellent skills in other courses, such as Object Oriented Programming (OOP) and Internet of Things (IoT). In IoT course, she implemented an automatic plant watering predictor using sensors. Furthermore, she delivered an IoT project titled 'Eyes for Blind,' in which she used a stick with a sensor at its extremity causing vibration and loud sound

when the blind person approaches an obstacle to avoid collision. Additionally, she implemented an amelioration and perturbation algorithm for the Knapsack problem, a real-world optimization problem using Java language.

Mrs. Makki is an intelligent, ambitious, and extremely well-organized individual. She works precisely, conscientiously, and independently, demonstrating her ability to take on challenging tasks with confidence. Moreover, she is an excellent communicator, and she is reliable and hardworking. These qualities, coupled with her academic achievements, are a testament to her potential as a future scientist in the field of artificial intelligence.

I highly recommend Mrs. Joumana Makki without hesitation for any position or program that she may apply for. I wish her all the best in her future endeavors and would gladly continue to support her. Mrs. Makki is an absolute asset to any working group.

Sincerely,

Kassem Danach, Eng, PhD

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A handwritten signature in blue ink, appearing to be 'K. Danach', with a stylized flourish at the end.