

**Hahn-Schickard-Gesellschaft für angewandte Forschung e.V.**  
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## Letter of Recommendation

To Whom It May Concern,

It is my great pleasure to recommend Mr. Mohamad Mahayni, who completed his Master's thesis under my supervision in the Software Solutions / AI group at Hahn-Schickard from October 1, 2025, to April 30, 2026. During this period, he was an integral part of the ULTRA-SAVE project, a high-level research initiative focused on the ultrasonic monitoring of plant stress using advanced machine learning.

Mr. Mahayni's primary contribution was the architectural design and implementation of an AI-based filter to distinguish genuine acoustic plant events from complex environmental noise. This task required a high degree of technical sophistication, which Mr. Mahayni mastered by developing a full-scale pipeline: from acoustic signal processing and Continuous Wavelet Transform (CWT) image generation to the training of a CNN-based autoencoder.

He demonstrated exceptional methodological rigor by implementing a custom Optuna hyperparameter optimization objective, specifically tailored to the nuances of our dataset. Furthermore, his use of latent space visualization to interpret model behavior provided our team with valuable insights for further refinement.

What sets Mr. Mahayni apart is his remarkable ability to take ownership. After an initial induction phase, he navigated the complexities of the development process independently, requiring minimal guidance to deliver high-quality results. He possesses the rare ability to quickly bridge the gap between theoretical research and practical tool application. His work not only contributed significantly to the ULTRA-SAVE project but also provided substantial relief to my own workload.

While Mr. Mahayni initially excelled through a very structured and methodical approach, I was particularly impressed by how he evolved throughout the project. He became increasingly proactive and flexible in his problem-solving, showing a strong capacity for self-reflection and continuous professional growth.

Beyond his technical excellence, Mr. Mahayni was a dedicated and enthusiastic team member. He communicated his findings with great clarity in group meetings and showed a genuine interest in the project's broader impact. His voluntary engagement in company events further highlighted his commitment to our organizational culture.

I recommend Mr. Mahayni without reservation and with the highest enthusiasm for positions in applied AI research, machine learning engineering, or any related field. I am confident that he will be a valuable asset to any organization, and I wish him continued success in his professional career.

Yours sincerely,



**Patrick Selle**

Researcher, Hahn-Schickard

Cooperation with IESLab, University of Freiburg

ULTRA-SAVE Project Lead