

## Letter of Recommendation

Dear Hiring Committee,

It is with great pleasure that we write this letter of recommendation for Mr. Alexandre Labau, who has been working as an intern in the Directorate of Space Transportation on the Ariane 6 Transition Program at Daumesnil, from September 2, 2024, to May 28, 2025.

Mr Labau's contribution to our manufacturing digitalisation initiatives for manufacturing, logistics, and sustainability. In this respect, he developed an application for Smart Manufacturing featuring Digital Twins (CAD) and Predictive Maintenance through Machine Learning to detect pattern anomalies in real time (Python) so to reduce downtimes, costs and energy consumption of ESA assets.

His work on sensor development and implementation showcases a rare combination of technical expertise and practical ingenuity. From the meticulous design and fabrication of sensors, including sophisticated C++ programming and custom CAD housing creation, to the establishment of a comprehensive data pipeline for real-time analysis and visualisation, to the seamless pipeline of data acquisition, signal retrieval, processing, and real-time display thanks to the dashboard application he developed. This application also features a CAD module that offers a detailed, interactive view of the asset in question.

Furthermore, Mr. Labau's deployment of an industrial-grade smart sensor for Audio Classification Transformers underscores his forward-thinking approach and alignment with ESA's commitment to leveraging cutting-edge technologies.

Throughout his internship, Mr. Labau has proven to be a very responsible and passionate intern with good communication skills, being able to discuss, present and document the results of his work precisely and concisely. Mr. Labau demonstrated a strong, independent work ethic and the ability to evolve autonomously and adapt quickly. Through personal initiative, Mr. Labau was able to identify problems, suggest solutions, implement them and present his work as he did at the AI@ESA event organized in ESTEC, gathering experts in artificial intelligence in various fields of application.

Given the quality of Mr. Labau's work, we have decided to extend his internship period.



Overall, we consider that the work developed by Mr. Labau has been relevant for the section and its projects and was of great interest to ESA. In conclusion, I highly recommend that Mr. Labau be given a chance to pursue his professional career in your company.

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(Nicoletta Wagner, Space Transp. Infrast. Project Manager)

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(Michael Mallon, Dr.-Ing., Supervisor)