



TECHNISCHE
UNIVERSITÄT
DARMSTADT

Letter of recommendation for Yumao Liu

Dear Sir or Madam,

It is my pleasure to recommend Yumao Liu for an industrial internship in the field of SLAM (Simultaneous Localization and Mapping).

Mr. Liu is a very proactive and well-organized student assistant at my institute. His work involves collaboration in an interdisciplinary research project to investigate the potential of data-driven production, for which the use of an IoT platform is being studied. Within the project, Mr. Liu develops and programs software applications to further develop the platform and to make machines of the institute remotely monitorable and remotely controllable with the IoT platform. Furthermore, he supports the demonstration of the platform during guided tours and advises project participants regarding the connection of demonstrators. While working with other project participants, Mr. Liu always takes responsibility and stands out especially for his dedicated and professional manner. He has a profound knowledge of engineering and applied computer science, very good programming skills (especially in Python and Javascript) and an extraordinary ability to learn and adapt. Due to his precise analytical skills and his very fast comprehension, Mr. Liu found excellent solutions, which he consistently and successfully put into practice.

Prior to his work at my institute, he had already worked on a group project at my institute which is a mandatory part of the master's degree and he completed it with an outstanding result. The goal of this project was to investigate the potential of IoT in production. For this purpose, the group, led by Mr. Liu, connected robot arms based on OPC-UA to the IoT platform and developed and programmed computer vision-based robot arm kinematics. This enabled the robot to correctly detect circuit boards through object recognition and grasp them subsequently. Mr. Liu was the team leader of his team and led his team to success through great commitment, dedication and conscientiousness.



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Mr. Liu told me that he is very interested in the topic of SLAM (Simultaneous Localization and Mapping). He already has theoretical knowledge in this field from lectures and independent studies of the subject (among other things, he taught himself C++ and has already worked on his first projects). Now he would like to expand his already acquired theoretical knowledge in the field of SLAM with practical experience, especially with regard to UAVs.

With his open nature, his fascination for the interplay of technology and computer science and his willingness to constantly develop and learn new things, he is the perfect candidate for an industrial internship. I have no doubt that Mr. Liu will make a valuable contribution to SLAM projects during an internship due to his very good programming and language skills (German, English and Chinese), his independent nature, his willingness to take responsibility and his always qualitatively outstanding results.

Considering his determination, initiative and professional and personal qualifications, I can recommend Mr. Liu without any reservation.

With kind regards,

Darmstadt, den 14. Dezember 2022

Prof. Dr.-Ing. B. Schleich