

Internship Offer 2021

Title	Learning a smart plinth with a 3D camera
Internship level	Master 1, Master 2, Engineer 2 nd or 3 rd year
Start date and duration	4 to 6 months. Start-up 2nd semester of 2021. Long-term internship preferred.
City, Country	Annecy, France
University, Laboratory	University of Savoie Mont Blanc LISTIC - Computer Science, Systems, Information and Knowledge Processing Laboratory https://www.univ-smb.fr/listic/en/pages-en/ambient-intelligence-in-the-habitat/
Description of the Internship Subject	<p><u>Keywords: Machine learning, Internet of Things, Artificial Intelligence</u></p> <p>The context of this internship topic relates to ambient intelligence for the measurement of human activities in the habitat. It is part of a research program combining sensors, artificial intelligence for the analysis of human indoor behavior, particularly actimetry. https://www.univ-smb.fr/listic/pages-fr/intelligence-ambiante-dans-l-habitat/</p> <p>Connected plinths developed in the laboratory, composed of non-intrusive, inexpensive but not very accurate sensors, carry out anonymized measurements in low quality but provide useful information despite the low quality of the measurements. The objective is to make the measurement of higher level modalities related to actimetry (e.g. speed of movement, distance of steps) functional with sufficient accuracy, using low level sensors that do not directly measure these quantities.</p> <p>For this, it is necessary to go through a calibration phase. This step will connect the low level outputs of the plinths in order to deduce the actimetric quantities. It will be carried out by learning using "ground" data resulting from data processing obtained by 3D sensors capturing the scene where the plinths are placed.</p> <p>The objective of the internship is to implement this learning process, making the plinths intelligent, based on treatments using 3D sensors.</p> <p>The recruited person will be able to rely on preliminary work where the treatments from 3D sensors deliver the desired graders to measure, in particular walking speed, step distance, step position.</p> <p>The prototypes of plinths present in the laboratory will be instrumented and interconnected at the end of other preliminary work for this internship.</p> <p>The approach will be inspired by the one presented in the bibliography.</p> <p>Possible extension: study of the identification of persons (approach, steps)</p> <p>Bibliography :</p> <p>Zhao, M., Tian, Y., Zhao, H., Alsheikh, M. A., Li, T., Hristov, R., Kabelac, Z., Katabi, D., & Torralba, A. (2018). <i>RF-based 3D skeletons</i>. <i>SIGCOMM 2018 - Proceedings of the 2018 Conference of the ACM Special Interest Group on Data Communication</i>, 267–281. https://doi.org/10.1145/3230543.3230579</p> <p>Note: powerful (NVIDIA PC+GPU) and lighter (NVIDIA Jetson Nano or NX) computing platforms will be made available.</p> <p>Continuation of the internship as a PhD project is possible.</p>
Required skills	Autonomy, creativity, rigor. The desire to learn. Good knowledge in machine learning / deep learning, programming.
Gratification	Paid internship in the order of 520 € / month.
Tutors / Contacts	Stéphane Perrin / Eric Benoit stephane.perrin [@] univ-smb.fr eric.benoit [@] univ-smb.fr, Alexandre Benoit : alexandre.benoit[@]univ-smb.fr