Gestural interaction with Lensless Smart Sensors

Exipple S.L. is a company that links Computer Vision with User Experience in order to design simple and intuitive user experiences through natural interfaces, like gestural interaction. To that end, our product Gestoos\(^1\) is a Software Development Kit (SDK) that allows to incorporate gestural interaction into existing applications. More specifically, Gestoos is able to track hands and recognize hand gestures using depth sensors, in real time.

We propose a research project in the context of gesture recognition using a recent technology called Lensless Smart Sensors\(^2\) (LSS). As opposed to regular image sensors, LSS lack any kind of lenses, allowing to reduce their cost and size. In addition, they have interesting properties that make them attractive to perform feature matching between a stereo pair of sensors, for 3D reconstruction. Given the low power consumption, small size and low production cost of these sensors, they are well aligned with the Internet of Things (IOT) paradigm and the idea of make visually-aware a wide range of consumer devices.

The objective of the proposed project is to develop a machine learning methodology for gesture recognition using LSS. The student will be asked to define a real-world use case that will serve as a unifying thread for the whole project, as well as design the architecture of the proposed solution for that use case. After performing the proper review of the state of the art in relevant pattern recognition methodologies, the student should be able to develop a machine learning method for gesture recognition using LSS and evaluate it properly within the proposed use case.

The student will have the opportunity to interact with an international multidisciplinary team formed by experienced researchers in design and computer vision, being able to transfer research in computer vision into real world solutions.

\(^1\)Gestoos – www.gestoos.com