



## Hand Gesture Recognition Based On Micro-Doppler Analysis

Graduate

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### Objectives

The objective is to implement a hand gesture recognition (HGR) application based on a provided Doppler sensor developed in the ARE lab at Zhejiang University. The goal is to accurately detect 5 different types of hand motions: left, right, up, down swipes and a tap gesture.

### Methods | Experiences | Results

The hand gesture recognition is based on micro-Doppler analysis and machine learning. The application was developed using Python. The machine learning algorithms were trained on data collected during the thesis using Scikit-Learn built-in API.

The application communicates with the sensor through a USB port. Once data are collected from the sensor, it predicts the type of motions performed if any. The detected gestures and corresponding labels are then displayed.

During the tests, the application had a perfect accuracy when discriminating between the five expected gestures. For motions performed from an unsuspected direction the accuracy reduced to 81%. The offline detection of a gesture had a performance of 92%. The project demonstrated the feasibility of using machine learning for the HGR.

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Field of application  
*Infotronics*

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