

Natural Gesture Detection

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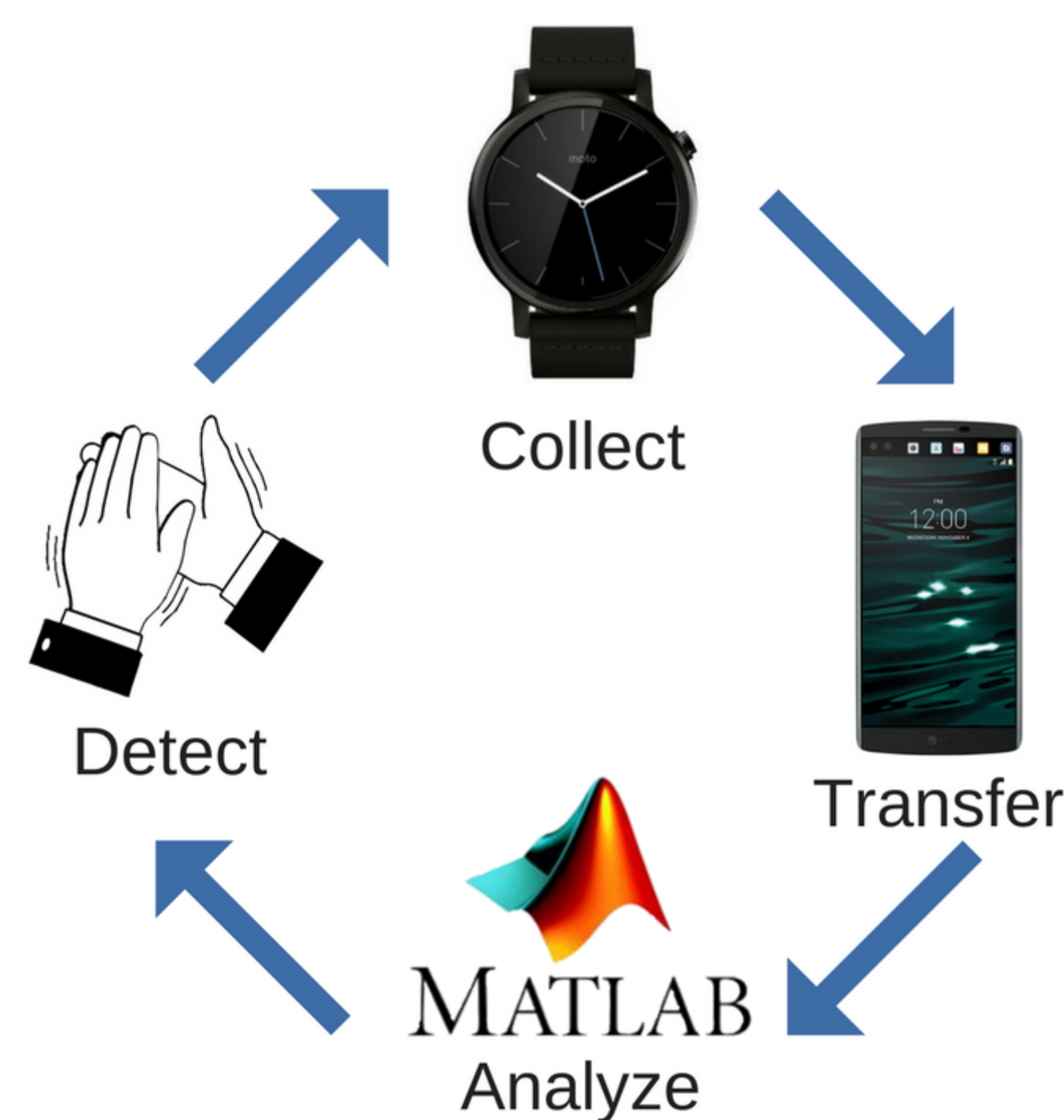
Problem

There are hundreds of computing devices in our daily environment that we interact with in unnatural ways. Gestures are natural, but how do we use gestures?

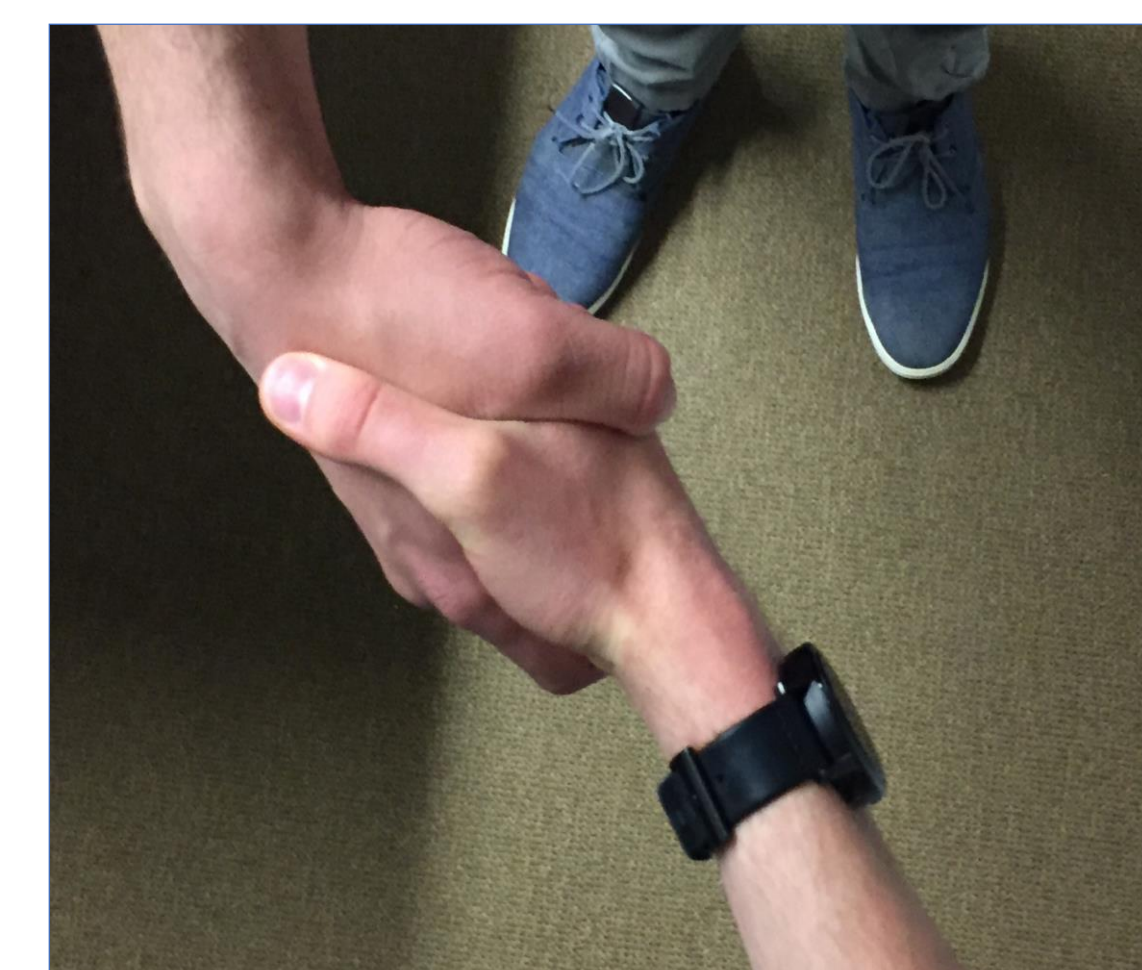
Goal

Disambiguate natural gestures as the first step to use in future human computer interaction research.

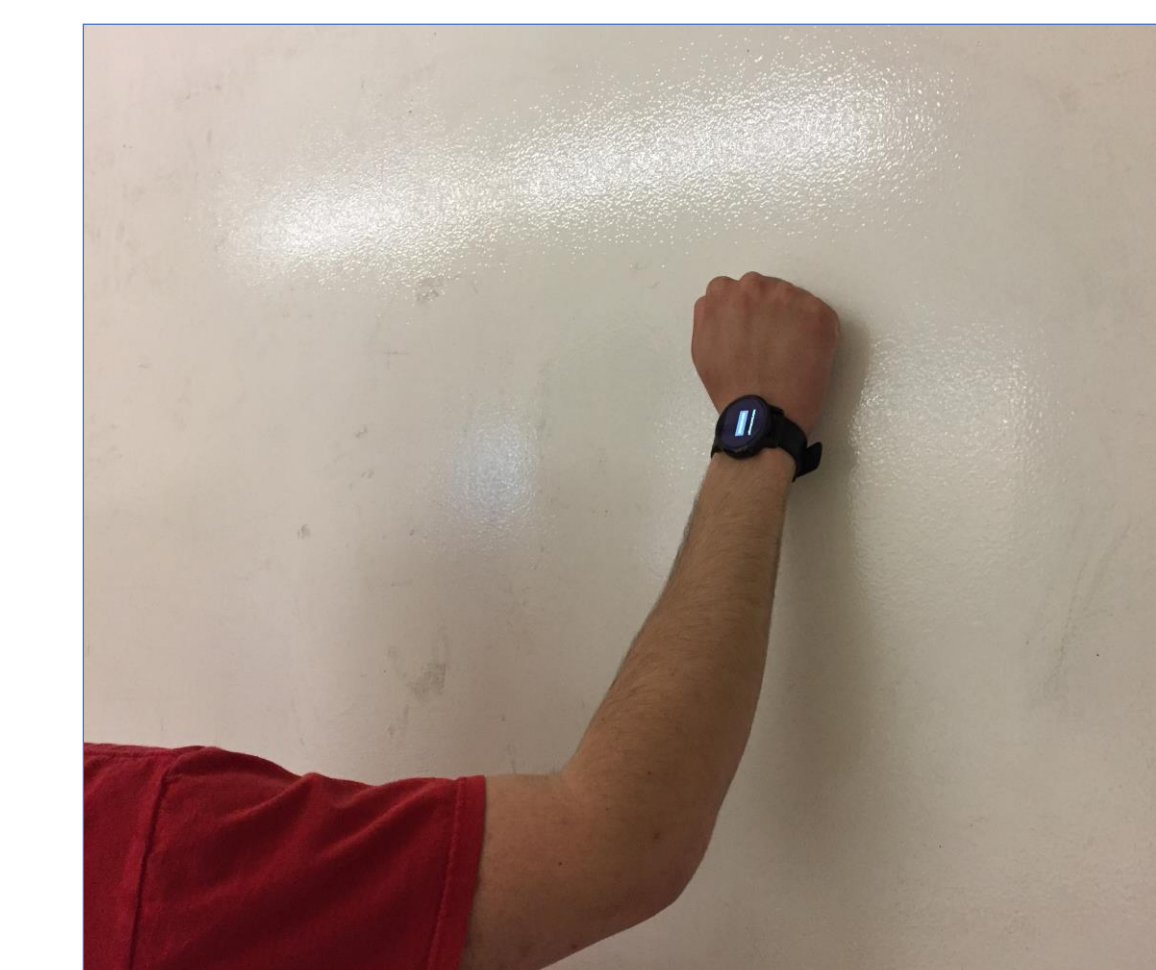
Method



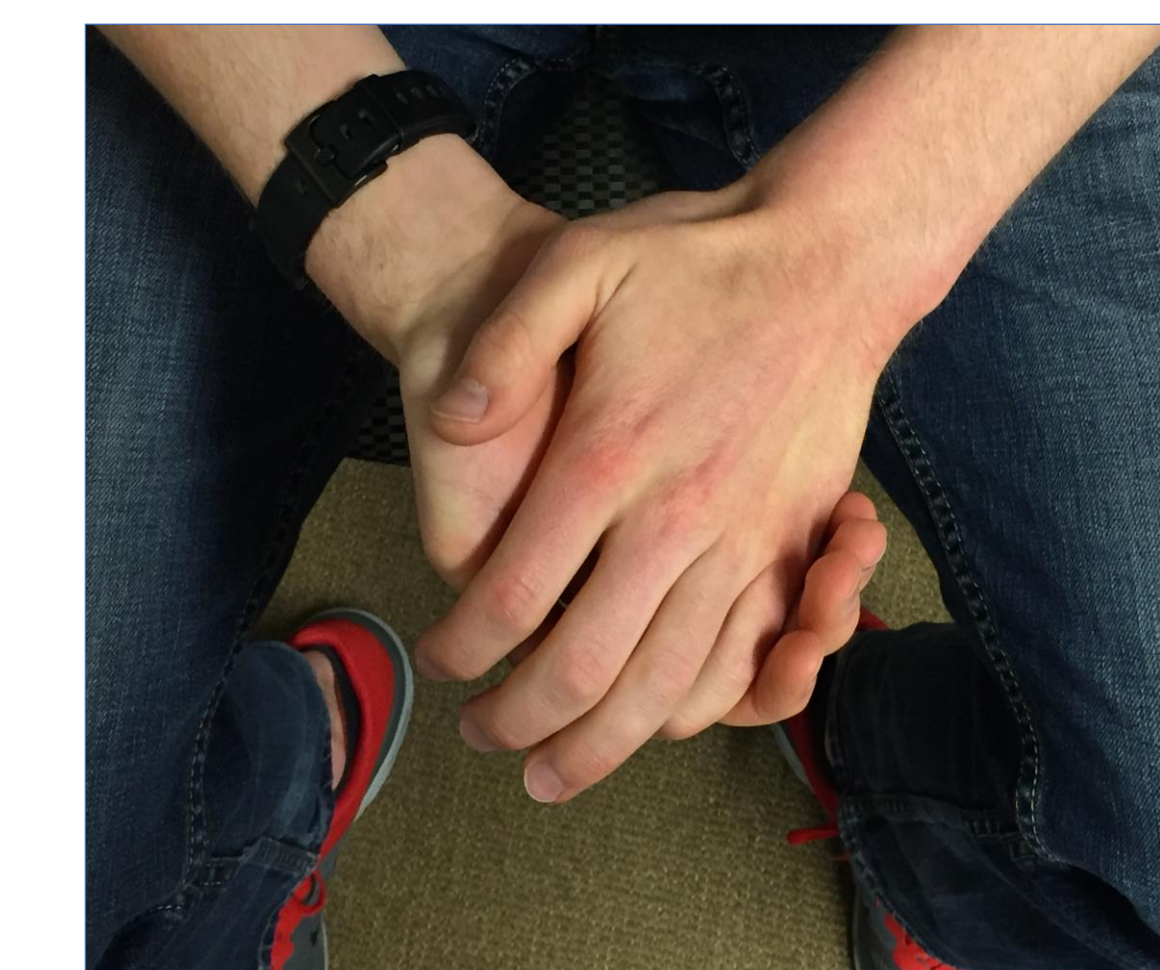
Gestures



Handshake



Knock

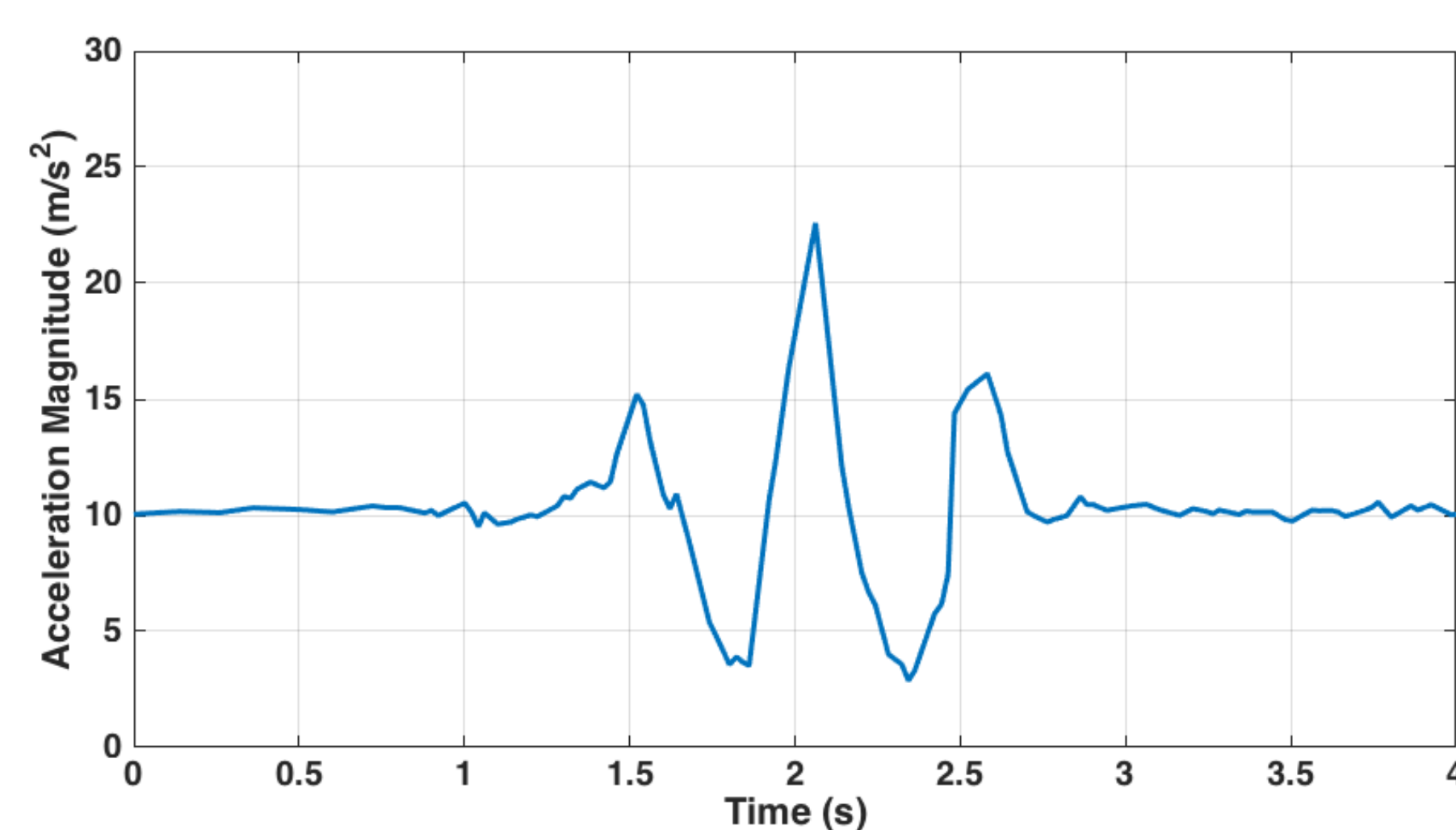


Clap

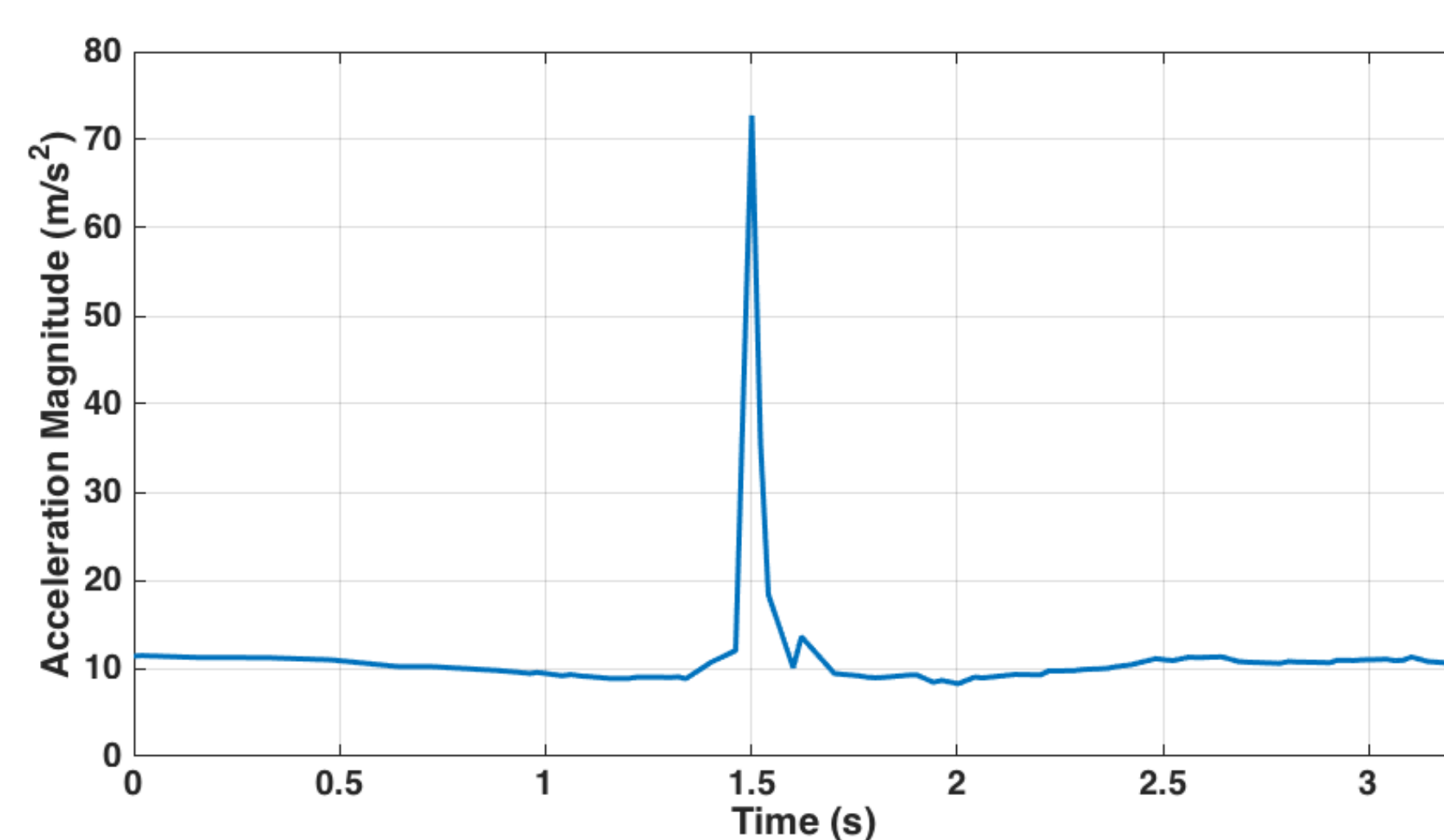
Results

Handshake

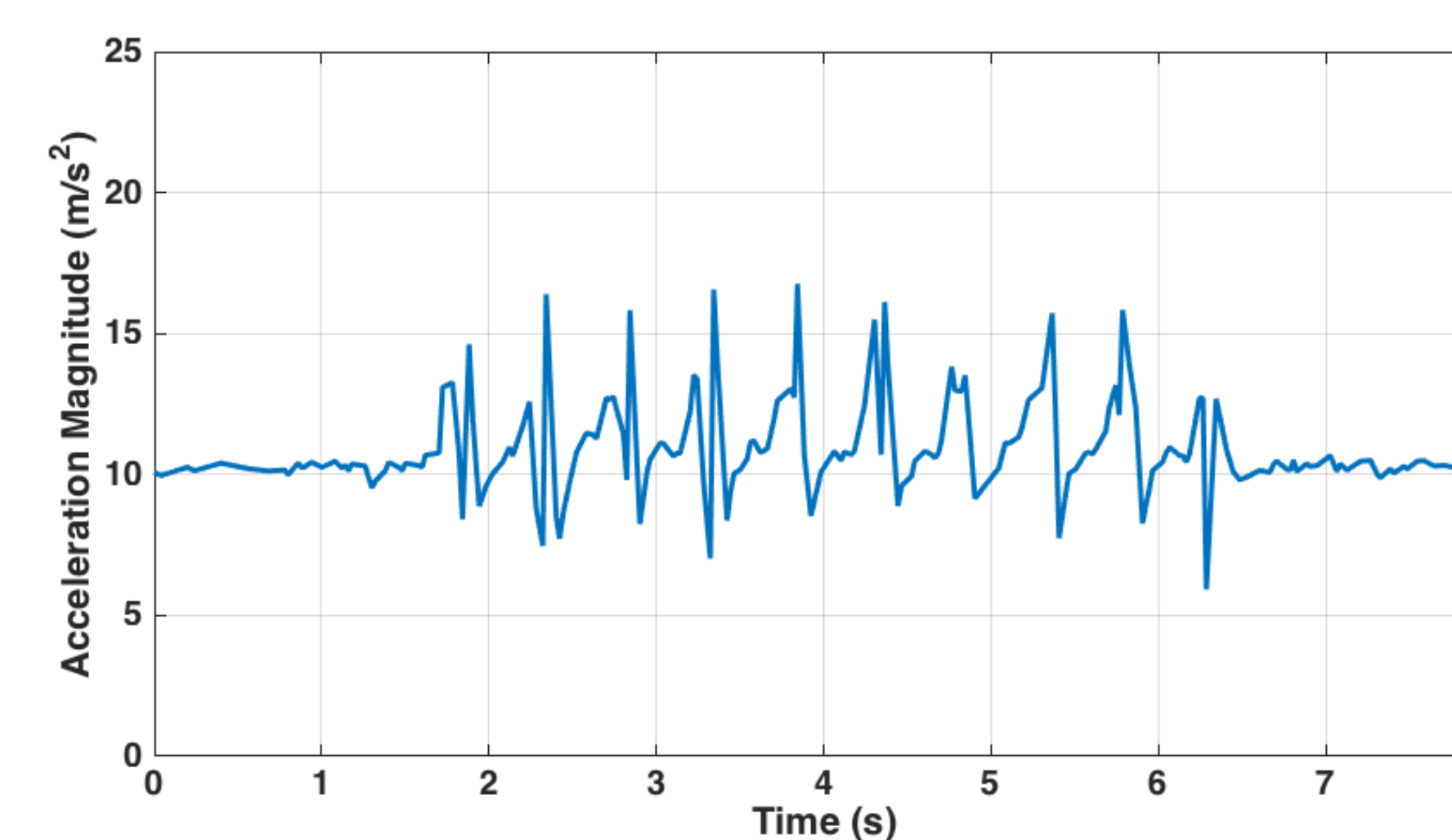
Detected



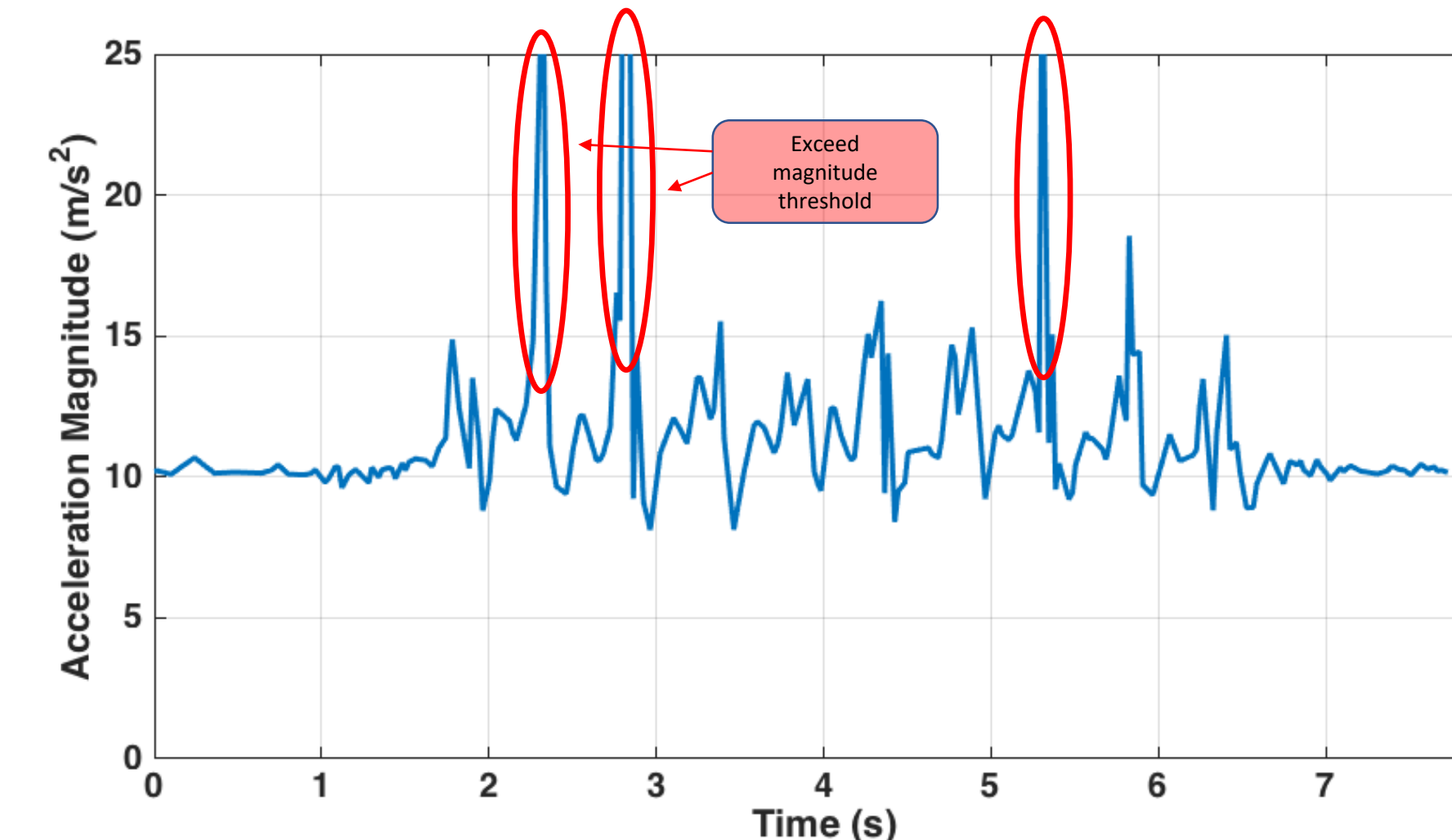
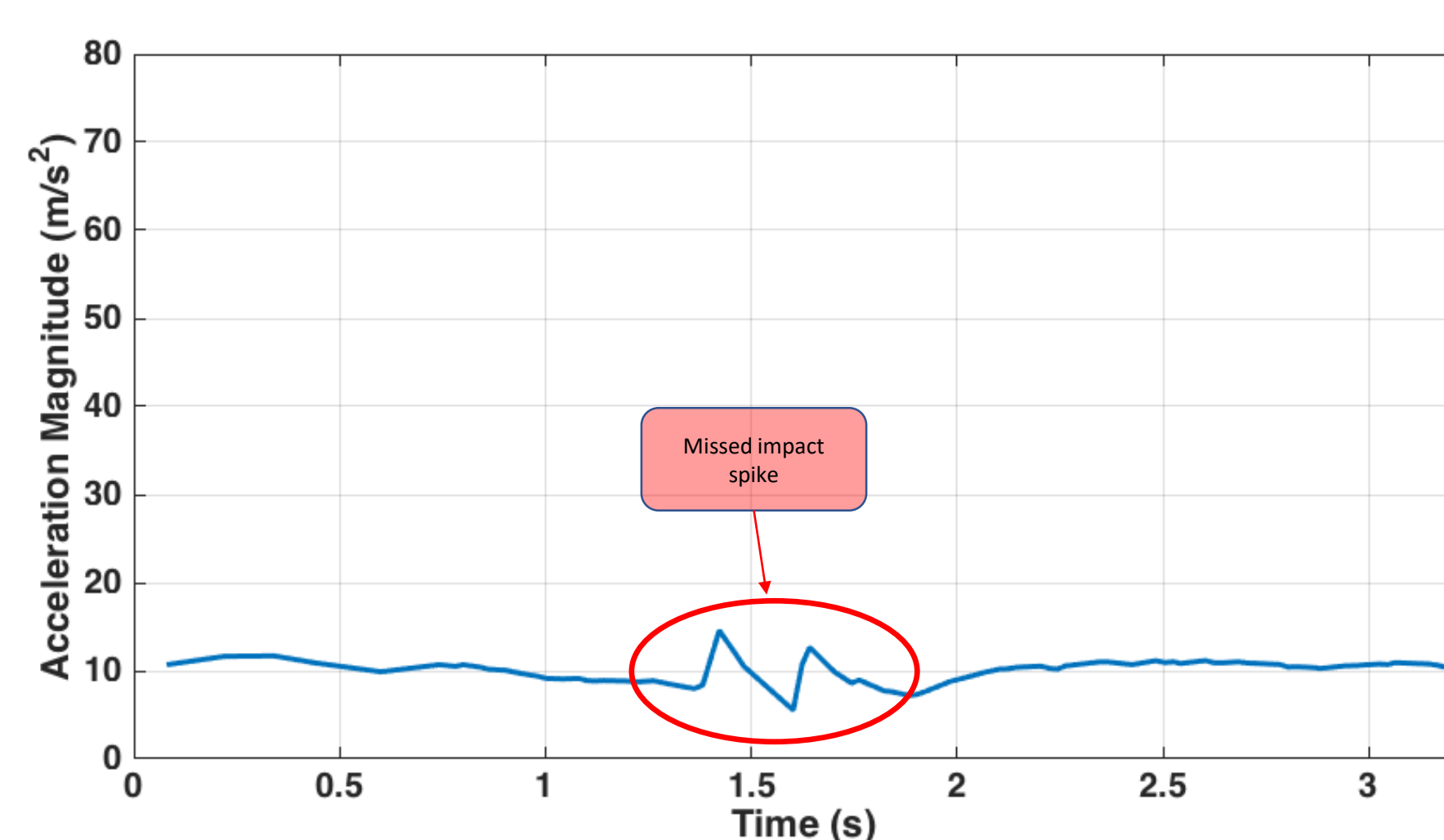
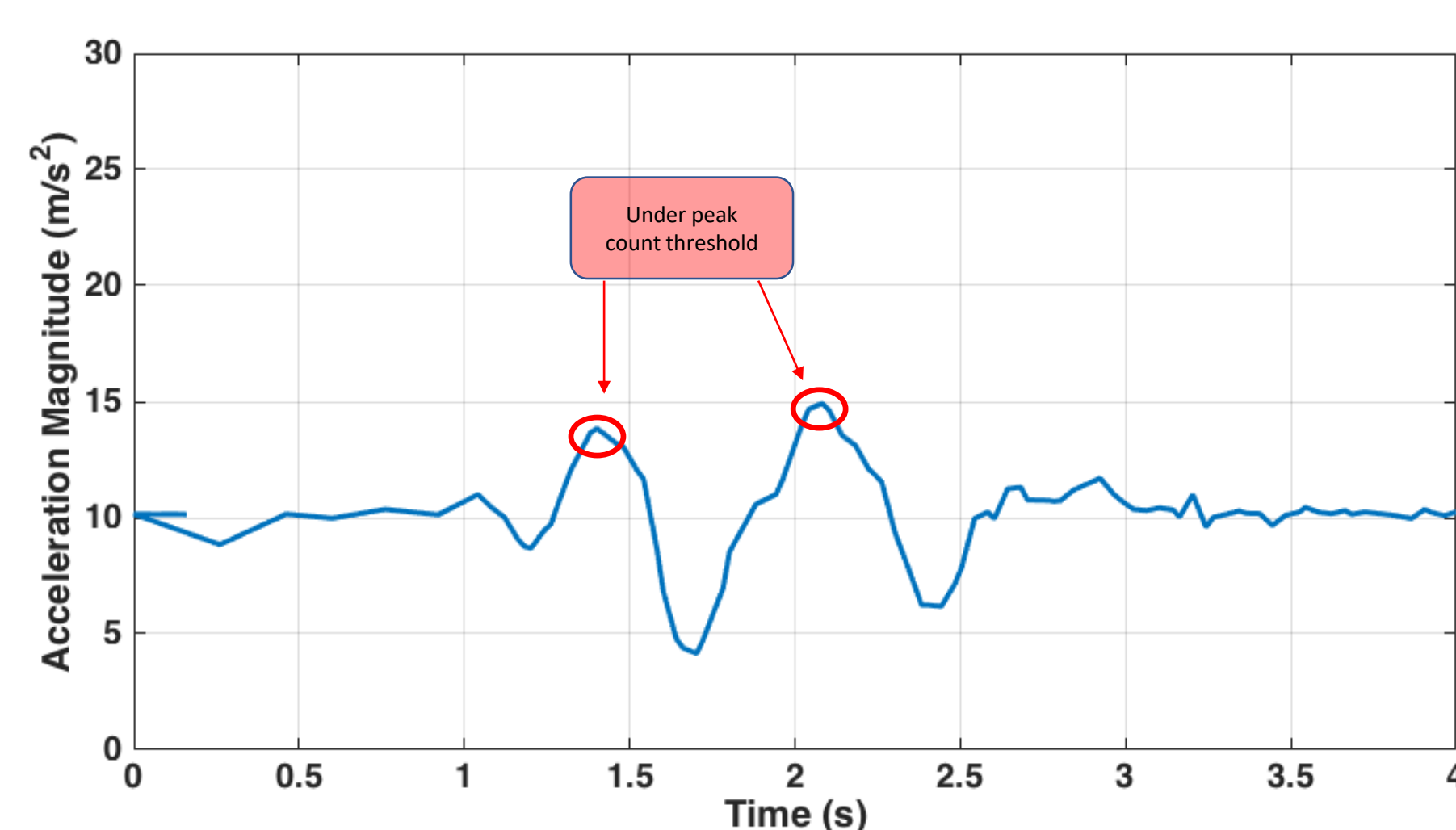
Knock



Clap



Not Detected



Confusion Matrix

N = 60		Output			
		Handshake	Knock	Clap	Unknown
Input	Handshake	17	0	0	3
	Knock	0	17	0	3
	Clap	0	0	18	2

Accuracy: 86.6%

Miss Rate: 13.3%

Average Sample Rate: 21.86 Hz

Handshake Detection Rate: 85%

Knock Detection Rate: 85%

Clap Detection Rate: 90%

Conclusions

- Current sensor APIs available are not directly suited for all gesture detection
- Sampling rate limitation decreases accuracy for some gestures
- Overall results support this method to be a feasible form of user input

Future Work

- Apply machine learning detection algorithm to improve accuracy and flexibility
- Build detection algorithm into mobile application for real time analysis

Example Applications

- Automatic contact exchange
- Individualized audience feedback
- Keyless door entry