

# STANDING JUMP LOFT TIME MEASUREMENT: AN ACCELERATION BASED METHOD

Susana Palma<sup>1</sup>, Hugo Silva<sup>1</sup>, Hugo Gamboa<sup>1</sup>, Pedro Mil-Homens<sup>2</sup>

*<sup>1</sup>Plux – Biosensor Engineering, Lisbon, Portugal*

*<sup>2</sup>Human Kinetics Faculty, Lisbon, Portugal.*

*<sup>1</sup>{spalma,hsilva,hgamboa}@plux.info, <sup>2</sup>pmil@fmh.utl.pt*

## ABSTRACT

This paper describes two methods for the measurement of loft time in vertical jumps using signals from an acceleration sensor. The vertical jump accelerometer characteristic curve is presented and notable regions corresponding to key stages of the kinetic activity are identified. Using the accelerometer signals along three dimensions two different algorithms were devised to compute the loft time. These algorithms are based on the morphology of the signal. The first uses the maximum value of the curve during the landing stage; the second uses the time interval between minimum and maximum values of the acceleration during the flight and landing stages, respectively. To validate these algorithms, a standard algorithm to compute the loft time from force platform signals was employed and these values taken as ground truth. Performance assessment was performed by computing the relative errors between the loft time determined from the force signal and the values obtained with each of the proposed approaches. Preliminary results for a set of 60 jumps led to relative errors of 7.0% for the first method and 2.9% for the second method.