



**Evaluation of Lower Limb Muscles Fatigue in  
400-meters Sprinting using Three Pacing Strategies  
Based on Surface EMG signals**

by

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## LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
BF	Biceps Femoris
CWD	Choi-Williams Distribution
CWT	Continuous Wavelet Transform
DDNF	Median of MDF and MNF
DECF	Decrease Force
DFT	Discrete Fourier Transform
DIDINF	Median of MDF and MNF
DRM	Median of RMS and MAV
EEG	Electroencephalogram
EMG	Electromyography
FFT	Fast Fourier Transform
FT	Fatigue
GL	Lateral Gastrocnemius
GM	Gluteus Maximus
GMS	Medial Gastrocnemius
iARV	Instantaneous Average Rectified Value
iEMG	Integrated EMG
iMAV	Instantaneous Mean absolute Value
IMDF	Instantaneous Median Frequency
IMNF	Instantaneous Mean Frequency
INCF	Increase Force
iRMS	Instantaneous Root Mean Square
JASA	Joint Analysis of EMG Spectrum and Amplitude
MAV	Mean Absolute Value
MDF	Median Frequency
MDNF	Mean of MDF and MNF
MH	Medial Hamstrings
MHW	Multiple Hamming Windows
MIDINF	Mean of IMDF and IMNF
MMG	Mechanomyography
MNF	Mean Frequency

MPF	Mean Power Frequency
MRM	Mean of RMS and MAV
MSW	Multiple Slepian Windows
MTRW	Multiple Trapezoidal Windows
MTW	Multiple Time Windows
MUAP	Motor Unit Action Potential
MVC	Maximal Voluntary Contractions
NIRS	Near-Infrared Spectroscopy
OCFT	Overcome Fatigue
PR	Prolonged Run
PS	Power Spectrum
RF	Rectus Femoris
RMS	Root Mean Square
SDDNF	Standard deviation and MDF and MNF
SDIDINF	Standard deviation of MDF and MNF
SDRM	Standard deviation of RMS and MAV
SEE	Standard Error Estimate
SEMBS	Semimembranosus
sEMG	Surface Electromyography
SMD	Semitendinosus
SMG	Sonography
STD	Standard Deviation
STFT	Short-Time Fourier Transform
TA	Tibialis Anterior
TB	Triceps Brachii
TVAR	Time-Varying Autoregressive
VM	Vastus Medialis
WD	Wigner Distribution
ZCR	Zero-crossing Rate

## LIST OF SYMBOLS

$C$	Set of Coefficients
$f$	Frequency
$Hz$	Hertz
$i$	Sequence of The Signal
$m$	Regression Slope Value
$N$	Population Size
$X$	Value of The EMG Signal
$n$	Degree of The Polynomial Regression
$P$	Sample Proportion
$S(t,f)$	Time-Frequency Spectrum
$t$	Time
$x$	Time Interval
$X_i$	Sampling Value of EMG Signal
$f_s$	Sampling Frequency
$p(f)$	Power Spectrum
$X_i$	Individual Sample Points
$Y_i$	Individual Sample Points
$R$	Correlation Coefficient
$y$	Feature of The Selected Domain
$Z$	Critical Value of The Normal Distribution

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