A. Supplementary Material | Algorithm for Identification of IFD

Study Conditions

EMG_{param} = [EMG parameters of Table 1]

HRV_{param} = [HRV parameters of Table 1]

$WS_{EMG} = [5, 10, 15, 20, 25]$ muscular activation periods

$WS_{HRV} = [30, 40, 50, 60, 70, 80, 90, 100, 110, 120]$ s

$\#Participants_{EMG} = 14$

$\#Participants_{HRV} = 11$

Study Conditions Applied to the Algorithm

$\{signal\} = EMG$ **or** HRV

Generic Algorithm

foreach P_k **in** $\{signal\}_{param}$ **do**
- $WS_{best} = None$
- $TS_{best} = None$
- $CV_{best} = \infty$
- **foreach** WS_z **in** $WS_{\{signal\}}$ **do**
  - $TS = [0, 10, 25, 50, 75, 90]\%$ of WS_z
  - **foreach** TS_y **in** TS **do**
    - $m_{array} = []$
    - $\sigma^2_{array} = []$
    - **for** $n = 1$ **to** $\#Participants_{\{signal\}}$ **do**
      - **if** $CV[WS_z; TS_y] < CV_{best}$ **then**
        - **1)** Generation of the evolution time series of P_k for a sliding window configuration of window size WS_z and time-step TS_y
        - **2)** Determination of the regression curve that best fits the time series generated in 1
        - **3)** Storage of slope m_n inside m_{array}
        - **4)** Storage of variance σ^2_n inside σ^2_{array}
      - **end**
    - **end**
    - **1)** Determination of m_{comb} and σ^2_{comb}, accordingly to the mathematical formalism defined in equations 4 and 5
    - **2)** Determination of $CV[WS_z; TS_y]$ (equation 8)
    - **if** $CV[WS_z; TS_y] < CV_{best}$ **then**
      - $WS_{best} = WS_z$
      - $TS_{best} = TS_y$
      - $CV_{best} = CV[WS_z; TS_y]$
    - **end**
  - **end**
- **end**
- For the combination $[WS_{best}; TS_{best}]$, application of criteria ↗ (section 2.3.2) in order to verify if P_k is and **Individual Fatigue Descriptor (IFD)**

end