



HUMAN ERECT POSTURE AND ITS *ECO-DYNAMIC* EQUILIBRIUM (*BALANCE*)

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Human biped stance can be defined as a *dynamical-mean* to control the human daily motor-tasks against the earth's gravitational force-field while maintaining balance, which is gained and spatio-temporarily developed through learning and adaptable neuro-mechanical physiological processes carrying language-like patterns (*information*) in its socio-ecological interactions. It has long been explored through *Newtonian* laws of motion (classical mechanics) to understand the (sensory-motor) control algorithms (neuro-physiological mechanisms) of the nervous system on the body through the muscles, known as the science of *motor control*. However, as the main actuator of the control is realized by the cross-bridge mechanisms in the muscles, where our understanding of the statistical nature of the muscle contraction and the generation of the muscle force (in the Newtonian sense) is in a rapid-progress today; it has found a better established analytical basis (thermodynamically based *Boltzmannian* approach) hoping to supply an insight (by having a *probabilistic approach*) to its informative context. The methodology of the two main approaches (*Newtonian versus Boltzmannian*) will be reviewed in the context of motor control theories by introducing physiological (*postural sway*) and pathological (*vestibular loss patients' sway*) data, where imprints of *ecological semantics* is to be pursued in their individual motor behavior (via *postural nonlinear dynamics*).