

Simulations of Active-Passive Cortical Activations Using Venn-Networks

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Abstract. Motor and sensory areas of the cortex have two independent pathways conveying descending and ascending signals to effectors throughout the body. Even though these signals are closely related to each other, it is not always the case that this should happen. E.g. on most instances motor commands generate movements of limbs that instantly triggers sensory stimuli (motor-sensory cortical activations); on few others cases, say when limbs are pulled (not voluntarily), only sensory cortical activation is noticed. In this work we present simulations using Venn-networks that exhibit these two distinct observable biological behaviors: active and passive activations, respectively. The simulations were organized in a way that active and passive movements, issued by a computer model based on Venn-networks, control flexions of effectors (i.e. artificial fingers) together with the corresponding (and expected) motor-sensory cortical activations.