SYSTEMS, APPARATUSES, DEVICES, AND PROCESSES FOR SYNERGISTIC NEURO-PHYSIOLOGICAL REHABILITATION AND/OR FUNCTIONAL DEVELOPMENT

ABSTRACT

In an embodiment a system for facilitating a subject's functional development includes sensing devices configured for sensing mind state signals; sensing devices configured for sensing body state signals; and a set of processing resources configured for generating a mind state indicator / measure, a body state indicator / measure, and a mind – body synergy indicator / measure that corresponds to an expected extent to which each of the subject's mind state and the subject's body state are cooperatively or synergistically aligned with respect to facilitating the subject's functional development. In an embodiment, the system can be configured for concurrently presenting a set of activities involving a model body part; engaging the subject in attempted imitation of the set of activities by way of attempted movement of a subject body part that is a mirror image of the model body part; presenting an indication of an expected extent to which each of the subject's mind state and body state are cooperative with respect to subject performance of the set of activities; and presenting an indication of an extent of subject relaxation. An associated multiple (e.g., up to 12) degree of freedom robotic orthosis can include a set of appendage motion modules configured for engaging with a portion of a subject appendage; a set of mechanical power interface modules coupled to the set of appendage motion modules and configured for facilitating movement of appendage motion modules within the set of appendage motion modules; and a set of flexible drive shafts couplable to the set of mechanical power interface modules.

FIG. 2A