

ABSTRACT
ROBOTIC MANIPULATION METHODS AND SYSTEMS FOR EXECUTING A DOMAIN-SPECIFIC
APPLICATION IN AN INSTRUMENTED ENVIRONMENT WITH ELECTRONIC
MINIMANIPULATION LIBRARIES

Embodiments of the present disclosure are directed to the technical features relating to the ability of being able to create complex robotic humanoid movements, actions, and interactions with tools and the instrumented environment by automatically building movements for the humanoid; actions and behaviors of the humanoid based on a set of computer- encoded robotic movement and action primitives. The primitives are defined by motions/actions of articulated degrees of freedom that range in complexity from simple to complex, and which can be combined in any form in serial/parallel fashion. These motion-primitives are termed to be minimanipulations and each has a clear time-indexed command input-structure and output behavior/performance profile that is intended to achieve a certain function. Minimanipulations comprise a new way of creating a general programmable-by-example platform for humanoid robots. One or more minimanipulation electronic libraries provide a large suite of higher-level sensing-and-execution sequences that are common building blocks for complex tasks, such as cooking, taking care of the infirm, or other tasks performed by the next generation of humanoid robots.

(Fig.1)