



2019 Human Movement Science Seminar
Seoul National University, Dept. of Physical Education



2019 서울대학교 체육교육과 인간운동과학 특강

Date & Time: November 25, 2019 (Mon) at 1pm

Location: 71-1, #308 at Seoul National University

Title: Physics of biological action and perception

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Abstract The physical approach to biological action and perception searches for laws of nature that would be able to account for specific features of biological systems. Biological systems differ from the inanimate world in using parametric control of actions: They produce actions by changing parameters of corresponding laws of nature associated with spatial referent coordinates for the moving effectors. At the level of control of single muscles, this approach led to the emergence of the equilibrium-point hypothesis. More natural actions involve multiple few-to-many transformations that allow ensuring task-specific stability of salient performance variables. Recent experiments have allowed reconstructing such hypothetical control variables and quantifying action stability at the level of hypothetical neural control. Within this general approach, kinesthetic percept can be defined as a stable manifold in a combined afferent-efferent space (iso-perceptual manifold, IPM). Efferent signals define referent coordinates and afferent signals define deviations of mechanical variables from those referent coordinates. This approach has allowed formulating new predictions tested in recent studies.

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