Literature review for 2D plane biofeedback

Point of interests while reviewing other literatures:

1. Other researchers’ methodologies.
2. How to make the process of learning motion efficient. (when learning new trajectory)
3. How to teach motion effectively.
4. Especially, when more DoFs are given, how to work with multiple DoFs, how to deal with the complex motions.
5. Focus on Morris Smith, Harvard. Exoskeleton

* All the research fields are multidisciplinary: this literatures are focused on the neurological aspect
  + - 1. 키워드가 낯설어. 페이퍼별이 아닌 이 분야 전반적인 키워드들을 모아두는게 나을 것 같다.
      2. 분명히 흥미로운 분야가 있다. 하지만 너무 낯선분야라서 방법을 잘 생각해 봐야 할듯. 한글로 적자.
      3. 늘 최고의 리서치페이퍼는, impc때 처럼 아주 탄탄한 논리아래 매우 간단한 실험셋업. 그래야 가장 최단으로 데이터를 뽑을 수 있다.
      4. 궁극적인 목표가 바뀌었어. 이건 참고로, 내가 박사때 이루면 그 이후는 어디든 보장된다. 뭐니? We talk about disturbance compensation a lot in terms of walking, standing. We have less info. about complex, non-repetitive motions, especially, with upper extremity. If we can somehow figure out how to model the CNS’s pre-program and implement on the humanoid. I guarantee that’s going to be a revolution!

Terms for each paper

1) Motor adaptation, Adaptive behavior,

2) Intrinsic volatility. Context-dependent decay hypothesis, motor adaptation, zero-error clamp(zec

1. Persistence of Motor Adaptation During Constrained, Multi-Joint, Arm Movements

Viscous force field perturbing the limb perpendicular to the desired direction of movement.

Compared **kinematic** (limb’s trajectory) and **dynamic** measures (patterns in muscle-generated torques) of performance before/after removal of the viscous force fields.

Both kinematic and dynamic criteria influence motor adaptation.

Kinematic dependent factors play a key role in the **rapid loss of adaptation** after **restoring the original dynamics**.

Preprogramming of movements = feedforward control. -> motor commands are generated by the CNS in response to sensory information as movements proceed. Feed-forward is necessary due to the long delays associated with visual and proprioceptive feedback pathways. // (my comment: the very same reason from “self-stabilization principle of bio-inspired manipulator”. 이 self-stabilization페이퍼에서는 사람 자체적으로 갖는 disturbance compensator 적인 면들을 근육 모델과 관절로 설명하려고 했지. 여기 adaptive behavior페이퍼에서 하는 말은 사람의 이런 외부 환경에 대한 적응 능력은 나이별로 상황별로 다른데, 그걸 보고 싶다는건가: 정확히 말하자면 how CNS adapts arm movements to change the dynamics the environment dynamics)

Movement adaptation is guided by the requirement to maintain an “invariant plan” of movements. This movement plan dictates the desired shape and temporal profile of the movement. VS. it is guided by the physical demands of the movement. Adaptation is to optimize dynamical characteristics of movement.

One key paradigm in this paper is: to separate the effect of kinetic and dynamic optimization: -> hand path is constrained by a rigid, rectilinear guide, then torques hat tend to move the hand away from this path result in increased contact force between the hand and the guide, without altering the movement trajectory.

난 여기서의 experimental setup을 migrate 할 줄 알아야 한다.

1. The Decay of Motor Memories is independent of context change detection.