Internal models in two-dimensional target motion prediction and interception.

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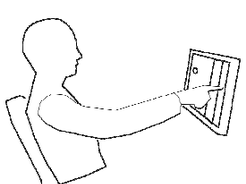
Introduction

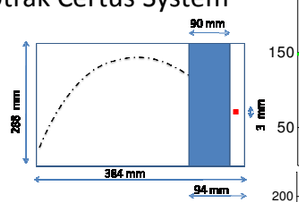
Prediction is a central skill in human life. As our environment is constantly changing, both as a consequence of our actions and independently of us, it's necessary to anticipate when and where future events will happen, in order to be able to synchronize our actions with them and to proficiently interact with the world (e.g. Gredebäck et al. 2002). The study of interception abilities represents a good option to investigate this topic, as interception is a quite common task and, at the same time, it strongly requires anticipation skills. In fact it wouldn't be possible to catch any target acting in a purely reactive manner, due to the visuo-motor transmission delays of the human body (Zago & Lacquaniti, 2005). In an interception study we **evaluated which aspects of target behavior are important to improve prediction, focusing in particular on acceleration and motion direction**. We also compared interception results with the ones of a similar purely visual task to evaluate whether **different mechanisms are involved in prediction in dependence of the goal of the predictive effort**.

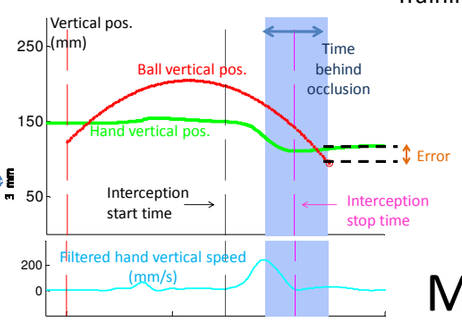
Methods

Motor Task

• Optotrak Certus System







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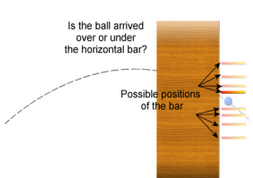
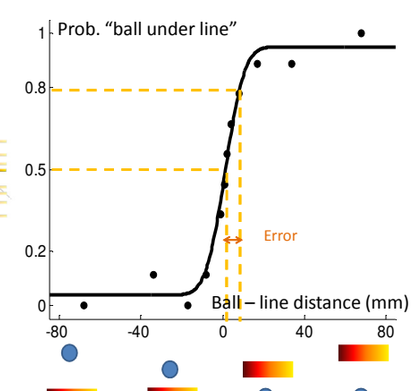
Visual Task

• VISAGE and BARCO





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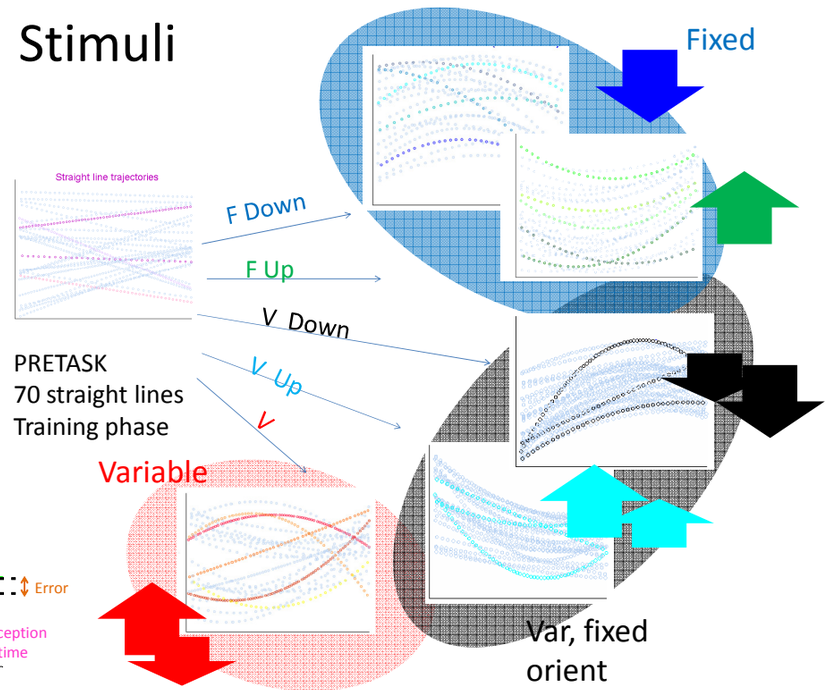
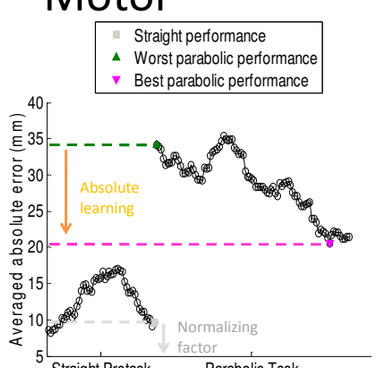
Stimuli

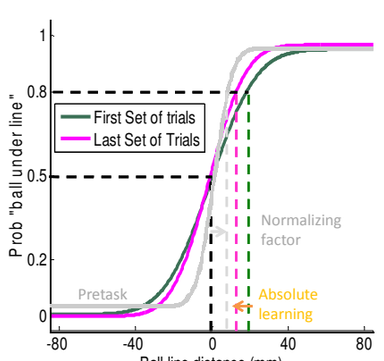


Measure

Motor

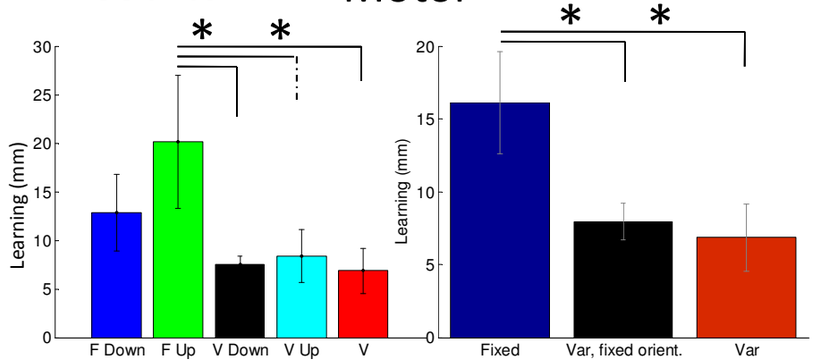


Visual

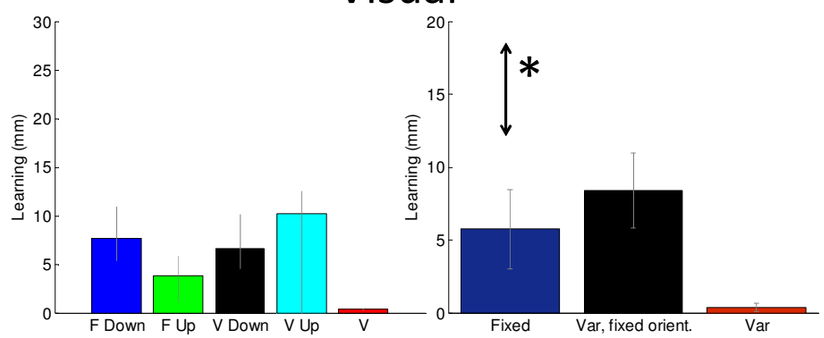


Results

Motor



Visual



Learning in the motor task is significantly greater in the case of acceleration and motion orientation stability, while in the visual condition no significant improvement due to stability could be observed. → motor learning?

Short Bibliography

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Aknowledgements

This work was part of the ROBOTCUB (IST-004370), and the ITALK (ICT-214668) European projects.

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