
Internship/PhD proposal

InSitu (W. Mackay), Équipe-projet INRIA commune avec le CNRS et l'Université Paris-Sud
Bât. 490 - Université Paris-Sud - 91405 ORSAY - France

Advisors/Responsables:

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Internship duration/Durée du stage: 5 to 7 months

Title: Fitts' law for non rectilinear trajectories

Theme: Human Computer Interaction (Perception, cognition, interaction)

Prerequisites: Graphical programming with JAVA (Swing and Java 2D).

INTERNSHIP DESCRIPTION:

Fitts' law allows to predict the movement time MT to acquire (for example with a mouse) a target of size W at a distance D : $MT = a + b \cdot \log(D/W + 1)$. This law has been validated numerous times in laboratory settings where all the possible factors that can disturb participants of the experiment have been removed. Recently, we have investigated Fitts' law in a more realistic setting: during several months we logged the mouse movements of several people in their everyday use of computers. We found that Fitts' law holds, provided that we smooth the data or that we take into account characteristics of the task other than D and W .

One of these characteristics is the shape of the cursor's trajectory. We observed that in real-life, cursor trajectories are often not rectilinear (as opposed to lab Fitts' law experiments). The main topic of this internship is the study, by the means of laboratory experiments, of pointing tasks with some constraints on the trajectory. More precisely, using Fitts' law, the steering law and the two-thirds power law of Viviani and Terzuolo, the intern will propose possible models for some "slalom" pointing tasks. Then, the intern will build laboratory experiments to evaluate these models.

The follow-up Ph.D will further investigate, in laboratory experiments, the effect of factors that might influence pointing in real situations. This could lead to the design of novel pointing techniques that go beyond the classical method to facilitate pointing: enlarging W or reducing D .