State of the Art

Fitts

Fitts’ law [1] describes the relationship between movement time, distance, and accuracy for people engaged in rapid aimed movements. It has been verified over a

wide range of conditions.2 Of interest to HCI researchers is that the law applies to pointing and dragging using a mouse, trackball, stylus, joystick, and touchscreen. Fitts’ law has been applied by HCI researchers in primarily two ways, as a predictive model, and as a means to derive the dependent measure throughput. [2]

Lateralidad

Using the dominant hand produces fast inaccurate responses; using the non-dominant hand produces slow accurate responses.  Small targets are hard; large targets are easy.  [3]

Género

This study suggests that in both China and the UK gender differences in computer ownership- might no longer exist for young adults at university. The present study confirms previous research that British males were more likely to have used a computer for the first time earlier than their female counterparts. This could be explained by the fact that most British students in the study used computers for the first time more than five years previously when a computer was perhaps characterised as more ÔmasculineÕ, than at the time of the study. [4]

The current study examined changes in computer experiences among incoming college students from 1989/1990 to 1997. As predicted, students in 1997 had more computer experience than earlier students, and gender di􏰇erences had diminished. However, in both years, males were more experienced than females with computer programming and games, and, in 1997, males were more likely to own a computer than females. Computer ownership as well as greater experience with programming and games may all enhance the technical sophistication of males with computers and account for the greater degree of competency and comfort with both the Internet and computers found among male students compared with female students in 1997 in the second part of the study. [7]

For the United Kingdom sample, there were no gender differences in computer anxiety but males held more positive attitudes than females. For the Hong Kong sample, there were no gender differences in computer attitudes but males reported greater computer anxiety [8]

The results comparing the genders on interaction difficulty. Men scored higher than women, although the difference was not strongly sifnificant. [9]

The results of this experiment confirm the expected gender effect, with male subjects performing significantly better than female subjects on a computer-based tracking task. The size of this gender effect was large: men outperformed women by 50 percent of the average amount of time on target. In line with this finding, proportion of male subjects who answered "Yes" to the questionnaire item, "I think that computers are easy to use" (72%) was also significantly higher than the proportion of female subjects who answered "Yes" (36%). [10]

Ojo

We know the eye can move faster than the hand [5]

Keystroke

The Keystroke-Level Model was developed to predict accurately task execution time for mouse-and-keyboard systems [6]

Cultura

Cultural characteristics of website users is a key factor to determining the user acceptance of a website, current design practice take little account of cultural issues during the design process. It is evident from the views presented in this paper that culture has a significant impact on how the user perceives a website. [11]

Fitts’ Law

Fitts published in 1954 his law that represents a model for human movement to predict the time that it takes for a user to move from an origin to a target. He created a function that measures speed and accurary in pointing tasks. This model could be used in the real world or in digital devices like using a computer mouse.

Scott MacKenzie [12] addapted the formula to be *MT= a + blog2(A / W + 1)* where MT represents the movement time, a and b are the empiric constants that are adjusted to the specific device used. A is the amplitude or distance from the initial point to the center of the target. W measures the width of the target and could also represent the accuracy of the pointing task as it sets the limits of the action. Fitts’s ID or index difficulty determines the movement difficulty and has units of bits [13]. The most used formula for ID is Shannon formulation proposed by MacKenzie [14] ID = log2(A / W + 1).

1

Fitts, Paul M. (June 1954). "The information capacity of the human motor system in controlling the amplitude of movement".*Journal of Experimental Psychology* **47** (6): 381–391.[doi](https://en.wikipedia.org/wiki/Digital_object_identifier):[10.1037/h0055392](https://dx.doi.org/10.1037%2Fh0055392). [PMID](https://en.wikipedia.org/wiki/PubMed_Identifier) [13174710](https://www.ncbi.nlm.nih.gov/pubmed/13174710).

2

Towards a standard for pointing device evaluation, perspectives on 27 years of Fitts’ law research in HCI

R. William Soukoreff􏰀, I. Scott MacKenzie Department of Computer Science and Engineering, York University, 4700 Keele Street, Toronto, Ont.,

Abstract

Canada M3J 1P3

Available online 4 November 2004

3

Fitts's Law Studies of Directional Mouse Movement

James Boritz

Kellogg s. Booth2

Williarn B. Cowan

4

Gender and cultural differences in Internet use: A study of China and the UK

Nai Li a,

Gill Kirkup b,\*

5

EVALUATION AND ANALYSIS OF EYE GAZE INTERACTION

Linda E. Sibert

Human Computer Interaction Laboratory Naval Research Laboratory Washington, DC 20375 sibert@itd.nrl.navy.mil

Robert J. K. Jacob

Department of Electrical Engineering and Computer Science Tufts University Medford, MA 02155 jacob@cs.tufts.edu

James N. Templeman

Human Computer Interaction Laboratory Naval Research Laboratory Washington, DC 20375 templema@itd.nrl.navy.mil

6

**Using the Keystroke-Level Model for Designing User Interface on Middle-Sized Touch Screens**

**Evgeniy Abdulin**

7

Gender, Internet and computer attitudes and experiences

P. Schumacher \*, J. Morahan-Martin

8

A Cross-Cultural Comparison of Gender Differences in Computer Attitudes and Anxieties: The United Kingdom and Hong Kong

Mark Brosnan

University of Greenwich, United Kingdom

Wanbil Lee

Lingnan University, Hong Kong

9

**An Exploratory Study of the Effects of Gender on Student Learning and Class Participation in an Internet-Based MBA Course**

[**   J.B. Arbaugh**](http://www.researchgate.net/profile/JB_Arbaugh)

10

J. EDUCATIONAL COMPUTING RESEARCH, Vol. 14(2) 171-183, 1996

GENDER AND SOCIAL FACILITATION EFFECTS ON COMPUTER COMPETENCE AND A TTITUDES TOW ARD COMPUTERS

RODCORSTON ANDREW M. COLMAN *University of Leicester*

11

**Cultural Issues and Their Relevance in Designing Usable Websites**

Alao Olujimi Daniel1, Awodele Oludele2, Rehema Baguma3, and Theo van der Weide4

* *Computer Science & Mathematics Department, Babcock University, Illishan-Remo, Nigeria\**
* *Computer Science & Mathematics Department, Babcock University, Illishan-Remo, Nigeria\**
* *Faculty of Computing & Information Technology, Makerere University, Kampala, Uganda*
* *Radboud University, Institute for Computing and Information Sciences. Nijmegen, The Netherlands.*

12

I. Scott MacKenzie y William A. S. Buxton (1992). Extending Fitts' law to two-dimensional tasks. Procedimientos de la conferencia CHI 1992 de la [ACM](https://es.wikipedia.org/wiki/Association_for_Computing_Machinery) sobre Factores Humanos en Sistemas Informáticos, pp. 219-226.

13

Using Fitts’ Law to Model Key Repeat Time in Text Entry Models William Soukoreff and Scott MacKenzie

14

**Fitts' law as a research and design tool in human-computer interaction**

MaxKenzie