Analysis of Mouse Movement Time based on VaryingControl to Display Ratios using Fitts' Law

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Abstract

This paper describes an experiment that attempts to determine what impact different control to display ratios will have on movement time of a mouse in a set of static tasks. The experiment shows that an increasing control to display ratio will actually increase the time it takes to perform a given task with the mouse. Linear regression models were built using Fitts' law to get a correlation between the five different control to display ratios that were used. A discussion of how the experiment was conducted and analysis of the results will be provided.

Keywords: CD Ratio, Fitts' law, index of difficulty, movement time

Introduction

The control to display ratio or CD Ratio, as it will be referred to in this paper, is the ratio between the distance the controller must be moved in order to cause the pointer to be moved a given distance on the display[1]. For purposes of this experiment, the first number in the CD Ratio will refer to the movement of the pointer and the second number will refer to the movement of the mouse. So, for example, if a CD Ratio is 2 to 1, then if the user moves the mouse one centimeter, then the pointer on the screen will move two centimeters. The question arises as to what the effect of a varying CD Ratio would have on a user performing some set of tasks with the mouse. At first glance, one would venture to say that the higher the CD Ratio, the faster the mouse will be moved and the movement time would decrease. However, if one looks closer at the question, a higher CD Ratio will not make the movement time faster due to the fact that a higher CD Ratio will hamper the user's ability to make fine movements with the mouse. These movements are in many cases the exact movements or tasks that an ordinary user will perform everyday with his/her computer. The hypothesis of my experiment is that an increasing CD Ratio will actually increase movement time rather than decrease it.

In order to get the necessary empirical evidence and to organize the evidence in such a way so as to test the hypothesis, Fitts' law was used in order to create models so a correlation between the varying CD Ratios could be attained. Fitts' law is a law for quantifying human performance. In our case, human motor performance is the quality that was modeled. Essentially Fitts' law states that movement time can be quantified based on an index of difficulty. This index of difficulty(ID) is defined as

$$ID = \log_2(A/W + 1) \quad (1)$$

where A is the distance or amplitude to move and W is the width of the target[6]. This formula is a refinement from the original equation for ID since this new formulation provides a slightly better fit with given data, it exactly mimics the information theorem that is the basis of Fitts' law, and it always gives a positive rating for the ID[7]. So using equation 1, Fitts' law states that

$$MT = a + b(ID) \quad (2)$$
or
$$MT = b(ID) \quad (3)$$

where MT equals movement time, and a and b are the intercept and slope coefficients respectively. Note that if the regression line does not go through the origin equation 2 would apply otherwise equation 3 will hold. In this experiment, equation 3 is used for reasons that will be explained in the Results section of this paper. So, using Fitts' law, models were built for each of the CD Ratios that were defined. Using these models, the hypothesis to my experiment can be tested.

Experiment

In this experiment, a group of subjects were used to perform a static set of mouse movement tasks for each of the five models built. These models represent five different CD Ratios namely ratios of 0.25 to 1, 0.5 to 1, 1 to 1, 2 to 1, and 4 to 1. These CD Ratios were chosen so as to give a nice spectrum of varying speeds from quite slow to very fast mouse movement. Once the data was collected, the data was analyzed and the hypothesis tested.

Method

Subjects. Five subjects were used in the experiment. All subjects were graduate students at Brown University with substantial experience in using the mouse. The five subjects consisted of three men and two women and all of the subjects used the mouse with their right hand.

Apparatus and Data Recording Software. The experiment was conducted on a Gateway 2000 computer with a Pentium 166 MHz processor. The Vivitron monitor had a 17 inch diagonal screen which was important because it allowed for tasks with high indexes of difficulty. The mouse used was the standard Microsoft mouse. The data recording

software, the Generalized Fitts' Law Model Builder(GFLMB) is a tool that allows for the collection of data based on the necessary components required in Fitts' law model building[9]. The GFLMB allowed for the varying of the movement tasks based on amplitude, width, angle, and CD ratio. Since the GFLMB was created for Fitts' law research, it was quite simple to generate the raw data required. The GFLMB presents itself during the data gathering process with a cross hair that simulates the mouse pointer. A target of varying size and distance is placed somewhere on the screen in the shape of a circle, square, or rectangle. Based on given conditions, the user must move the pointer and click somewhere within the target. The GFLMB will record movement time from the moment the user began the mouse movement to the time the pointer entered and was clicked in the target.

Organization. The organization of the experiment had to be one such that the static set of mouse movement tasks reflected a varied range of difficulty from the very simple to the very difficult. In order to construct good models, the index of difficulty had a range of approximately 2 to 7 so as to get a spectrum of difficulty that would characterize the types of tasks that users perform in actual computer use. A square was chosen as the target area for reasons of simplicity and that only the width of the square would have to be specified in the GFLMB. The squares had widths of 20.5 mm, 9.8 mm and 2.5 mm. These widths were chosen to simulate a small, medium and large target. Amplitudes of 80 mm, 160 mm, and 240 mm so as to once again simulate a task that required a small, medium, and large distance for the user to traverse. At first glance, the number of different widths and amplitudes seem small, however, a total of nine different tasks are generated based on the fact that each target was applied to each amplitude. Also two different angles were used , namely 10 and 150 degrees, so as to have the target at an angle from the initial starting point of the mouse cross hair.

These mouse tasks, although seemingly abstract because of the nature of the GFLMB, are not to be considered as such. They can be visualized as actual tasks that are performed in various applications. The target with a width of 20.5 mm could be considered to be any 2D primitive and the varying amplitudes account for different starting points from where the user happens to have the mouse cursor at a given point in time. The target with a width of 9.8 mm can be considered a icon or tool bar button in a word processor and the varying amplitudes are used in the same way as the previous example. Finally, the target with a width of 2.5 mm could be considered to be a space between two words or even the space between two letters. This task is done in word processing applications when the user wants to place the cursor in between letters or words for editing purposes. These tasks, even though they will appear in the GFLMB as simply a square and a mouse cross hair, can just as easily be considered a task in a real application.

Using these nine different tasks and equation 1, the index of difficulty could then be computed and is shown in table 1.

Amplitude	Target Width	Index of Difficulty
80 mm	20.5 mm	2.293
160 mm	20.5 mm	3.138
80 mm	9.8 mm	3.195
240 mm	20.5 mm	3.667
160 mm	9.8 mm	4.114
240 mm	9.8 mm	4.672
80 mm	2.5 mm	5.044
160 mm	2.5 mm	6.022
240 mm	2.5 mm	6.600

Table 1. ID's based on target width and amplitude using Eq. 1

These ID's give an adequate range of difficulty and were used in the regression modeling with the sample movement times that were collected.

Procedure. Each of the five subjects were taken to the computer to perform the experiment individually. Each subject was first told what they were going to be doing and as they performed the task to picture themselves as performing a real task. This instruction was to give the subject a sense of realism. After explaining what they were going to be doing, each subject was then placed in front of the computer. Each subject performed 5 sets. Each set consisted of 18 tasks and a set was used to distinguish each CD Ratio. So, each subject performed a total 90 tasks for a total of 450 tasks for all 5 CD Ratios. The 450 tasks led to each model have 90 data points for regression. The subjects were required to practice performing the experiment so that they would be comfortable in performing the tasks and so as to not have indecision which could effect the out come of the regression models. When a subject performed a set, they initiated the start of the set by clicking on a start button in the GFLMB menu screen. Once clicking the start button, the subject was in testing mode. The movement time was calculated once the mouse began to move and stopped after each trial once the subject clicked in the target. This feature allowed the subjects not to rush in between trials. The subjects were told to perform the task as quickly and accurately as possible so that they would not slow down purposely because of the experimental conditions. This way, the subjects would be performing at a speed comparable to the speed at which they work. If a subject attempted to click outside the target, a beep was sounded signifying that an error had been made. The subjects were instructed that if a beep was sounded to simply complete the task a quickly as possible. Errors became more prevalent with the higher CD Ratios for obvious reasons.

The data gathering portion of the experiment went smoothly. All the subjects performed as instructed. In analyzing the each subject as they performed the tasks, as the CD Ratio increased, it became increasing more difficult for them to quickly complete the task in relation to the lower CD Ratios. This occurred frequently with targets of 2.5 mm. The subjects also did show some displeasure when completing the task with a CD Ratio of 0.25 to 1 since they kept having to move the mouse of the end of the mouse pad and back

on to the center. This is intuitive since it takes quite a bit of mouse movement to move the pointer a short distance in that ratio. Further discussion will come later in the paper.

Data Analysis and Results

The first question that had to be answered in regards to the analysis of the data was whether or not to fit the regression equations through the origin or not. The problem with not going through the origin, namely using equation 2, is that if an index of difficulty is equal to zero, there still will be movement time. This movement time will come from the y intercept and implies that some cognitive thought is required to perform the task. Cognitive thought is naturally required for any given task, however, this experiment's hypothesis is based on reaction time only. Therefore, by making the regression go through the origin, the cognitive thought is disregarded so that the reaction time can strictly be the fixture of the model. So, in this experiment equation 3 was used for the building of the models. The models were built with least squares approximation using the Microsoft Excel spreadsheet. Note that the confidence level for all 5 models was 95% and all the models passed the f and t tests. The results of the modeling is as follows.

Model 1: CD Ratio 0.25:1

The first model, was the model with the slowest CD ratio. Since two outliers were removed from the model Figure 1 shows the scatter plot of the 88 data points used in building this model.

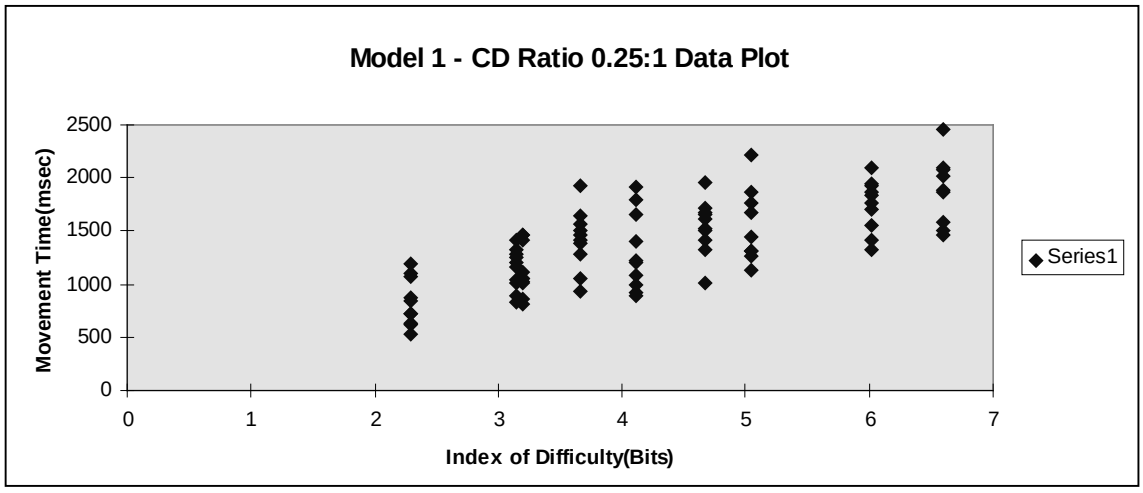

Figure 1. Model 1 scatter plot.

The regression statistics for the model showed that the r squared value equaled 0.45. The standard error, SE, was equal to 304.54. The linear fit of the model is shown in figure 2.

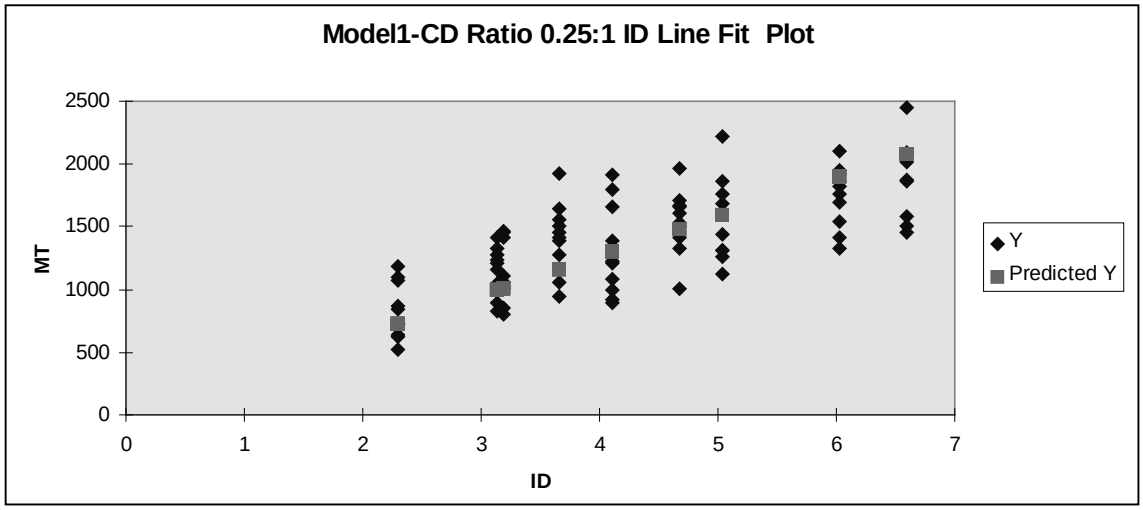

Figure 2. The regression line though the data points for a CD Ratio of 0.25:1.

Out of the 90 trials for this model, the error rate was only 1.1% which is not unexpected since the CD Ratio was so low. There was very little difficulty in completing the tasks, even the ones with high ID's. The equation for model 1 is

$$MT = 315.927(ID) \quad (4)$$

Model 2: CD Ratio 0.5:1

The second model appeared to be the model that the subjects found to be closest to what they were used to. In developing the model, only one outlier had to be removed. Figure 3 shows the scatter plot of the 89 data points used in the regression.

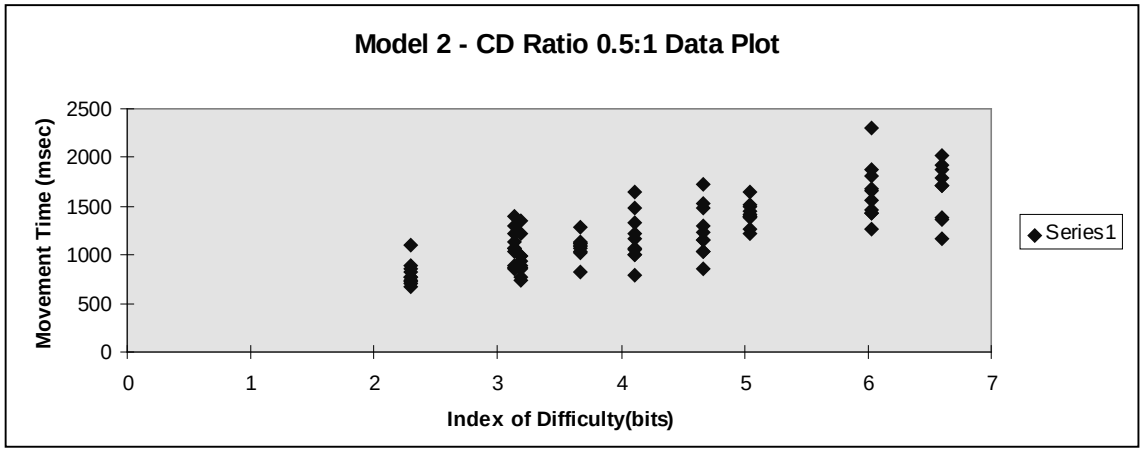

Figure 3. Model 2 scatter plot.

The r squared figure for this model equaled 0.54. The standard error, SE, equaled 233.79. This number is comparatively low which indicates that the subjects did not have much fluctuation for identical tasks. The linear fit of the model is shown in figure 4.

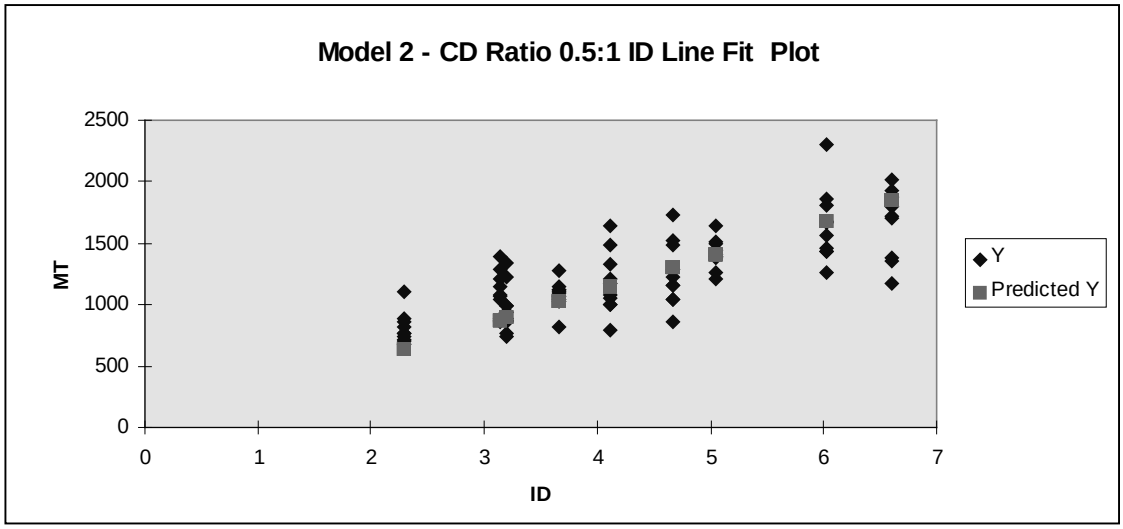

Figure 4. The regression line through the data points for a CD Ratio of 0.5:1.

Out of the 90 trials with this model, the error rate was once again only 1.1%. This error rate can be attributed to the fact that the CD Ratio of 0.5:1 is still relatively low resulting in slightly less control than with model 1, but still enough so as to have the subjects make relatively no errors. The equation for model 2 is

$$MT = 279.64(ID) \quad (5)$$

Model 3: CD Ratio 1:1

The third model can be considered an equality model since the amount of movement for the mouse will equal the amount of movement of the pointer on the display. In developing the model no outliers had to be removed, since there were no outlandishly high movement times. Figure 5 shows the scatter plot of the 90 data points used in the regression.

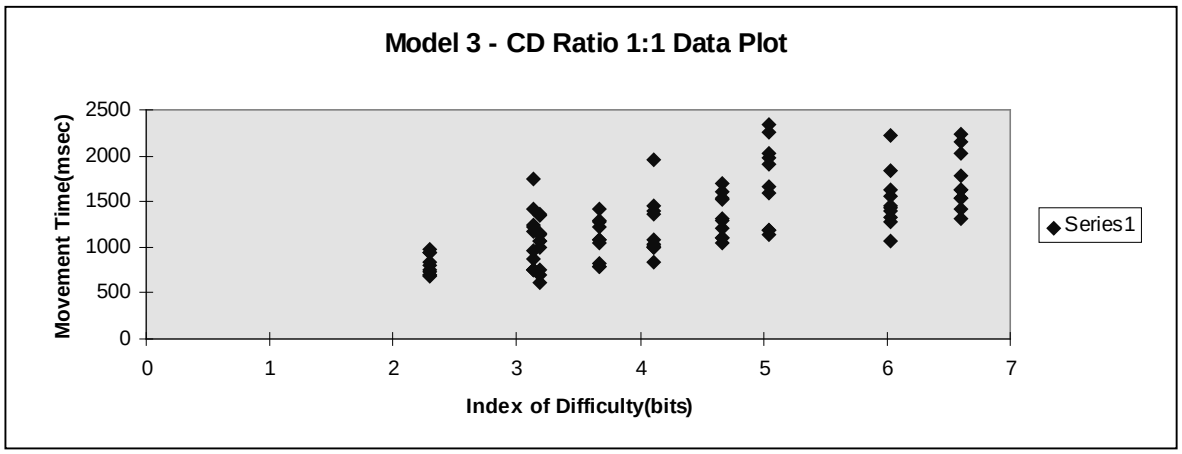

Figure 5. Model 3 scatter plot.

The r squared figure was relatively low at 0.39. The reason for this may be that even

though the subjects were given practice sessions, this was the first model that was tested and it may have taken the subjects this first session to get acclimated in regards to the actual timing process. However, this r squared figure is not that far from the rest of the model's r squared numbers. The standard error, SE equaled 325.79. Figure 6 shows the linear fit through the data points.

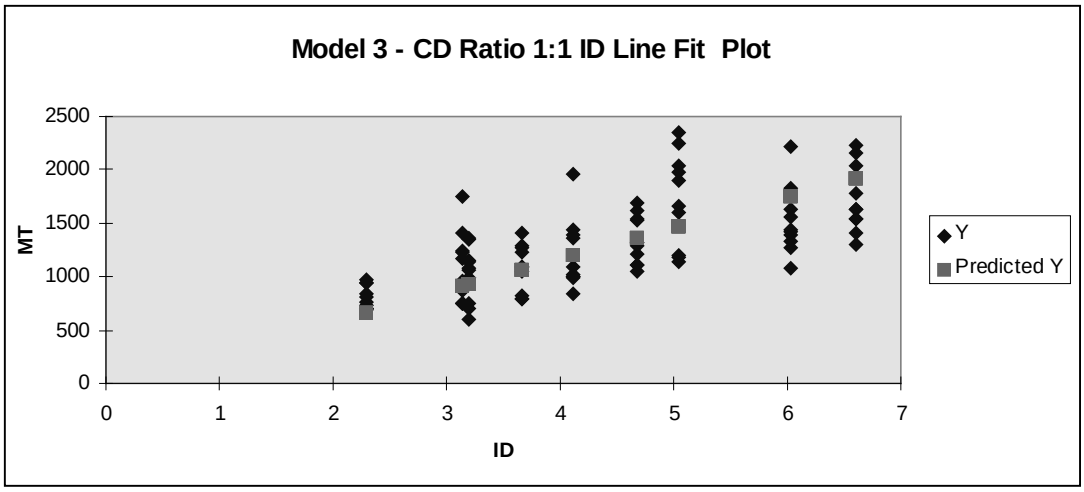

Figure 6. The regression line through the data points for a CD Ratio of 1:1.

Of the 90 trials used for this model, the error rate was 5.6%. As the CD Ratios get higher, the error rates will increase since the tasks are getting more difficult as less control is implemented. The equation for model 3 is

$$MT = 290.09(ID) \quad (6)$$

Model 4: CD Ratio 2:1

With the fourth model, the level of control begins to diminish since for every one centimeter the mouse moves, the pointer on the screen will move two centimeters. In this model, out of the 90 data points gathered, 4 outliers had to be removed. Figure 7 shows the scatter plot of the 86 data points.

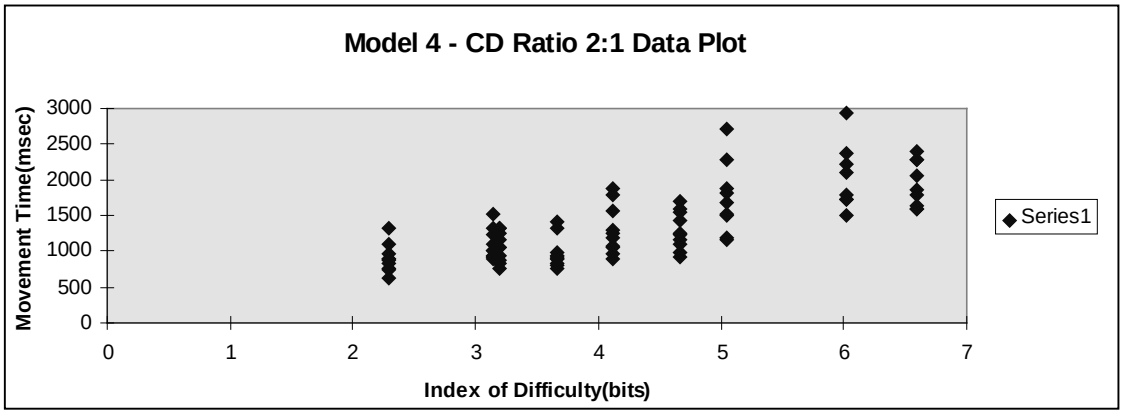

Figure 7. Model 4 scatter plot.

The r squared figure for this model equaled 0.56. This figure is much better than model 3's figure. The standard error, SE, equaled 329.65. Figure 8 shows the linear fit of the model.

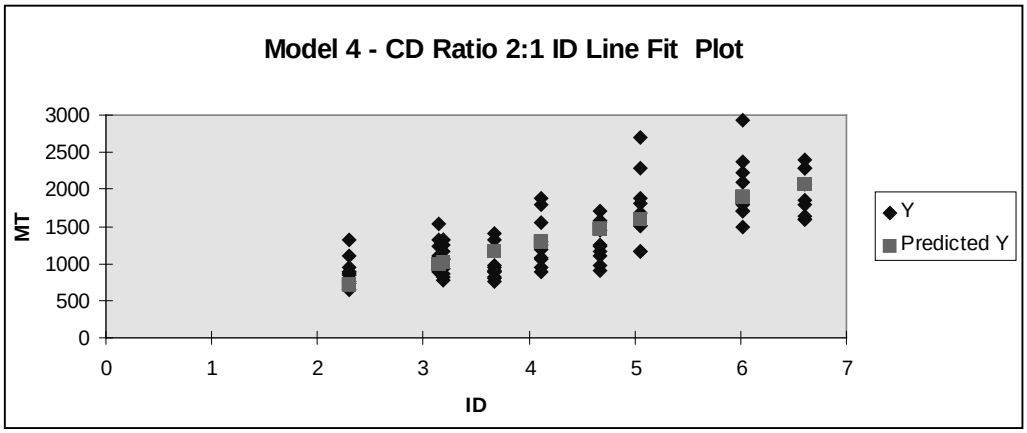

Figure 8. The regression line through the data points for a CD Ratio of 2:1.

Of the 90 trials done for this model, the error rate increased to 6.7%. The subjects had some difficulty in completing tasks with the higher ID's because of the precision required to click in such a small area. The equation for model 4 is

$$MT = 314.90(ID) \quad (7)$$

Model 5: CD Ratio 4:1

This model has a very high CD Ratio, so the mouse movement is very fast. This quick movement is excellent for moving form one point to another. However, as evidenced by the results from this model, precision is very difficult. Out of the 90 data points gathered 3 outliers were removed. Figure 9 shows the scatter plot for the 87 data points.

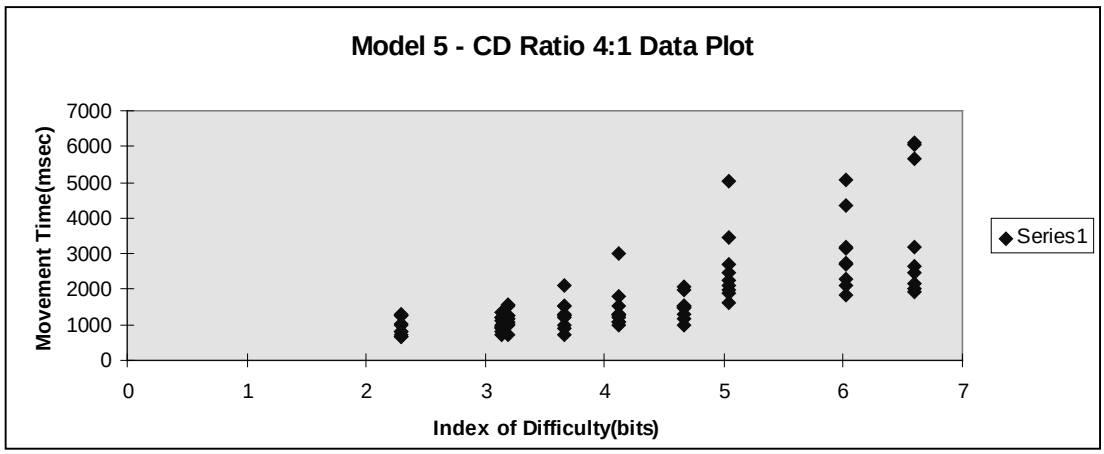

Figure 9. Scatter plot for model 5.

The r squared figure for this model was 0.46. The standard error, SE, was quite high at 872.64. This high SE can be attributed to the volatility of high CD Ratio. Figure 10 shows the linear fit of the model.

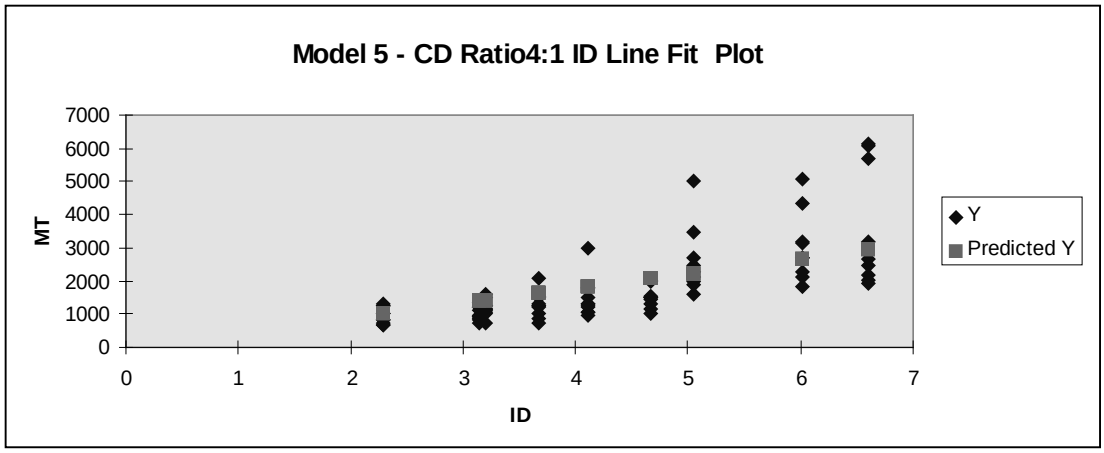

Figure 10. The regression line through the data points for a CD Ratio of 4:1.

Out of the 90 trials for this model, the error rate was high at 13.3%. Once again this can be attributed to such a lack of precision control for doing fine movements with the mouse. The equation for model 5 is

$$MT = 443.67(ID) \quad (8).$$

Discussion

Equations 4 through 8 give us the models needed to test the hypothesis. So, using the models, identical ID's for each model were plotted. Taking a ID from 1 to 8, so as to attain a full range of difficulty, all 5 models were plotted on the same graph. Figure 11 shows the results. The graph clearly demonstrates that the highest CD Ratio of 4 to 1 will have the highest movement time. The next highest movement times actually come from model 1, but model 1 and 4 are almost identical. Model 3 is next followed by model 2 as having the fastest movement time overall. Essentially, the hypothesis is proved correct since the higher the CD Ratio, the slower the movement time. The only quirk in the data is why model's 1 and 4 are almost identical. The question of why a model with CD Ratio of 0.25 to 1 and a model with CD Ratio of 2:1 are so close is a puzzling one.

When looking at these models the movement time can be broken down into two parts. The first part of the movement time can be associated with moving the mouse pointer to the target as quickly as possible. The second part of the movement time can be attributed to actually clicking the mouse in the target range. The precision factor is the key. With model 1, it takes quite a bit of mouse movement to move the mouse pointer a given distance but once close to the target range the level of control is high so the time it takes

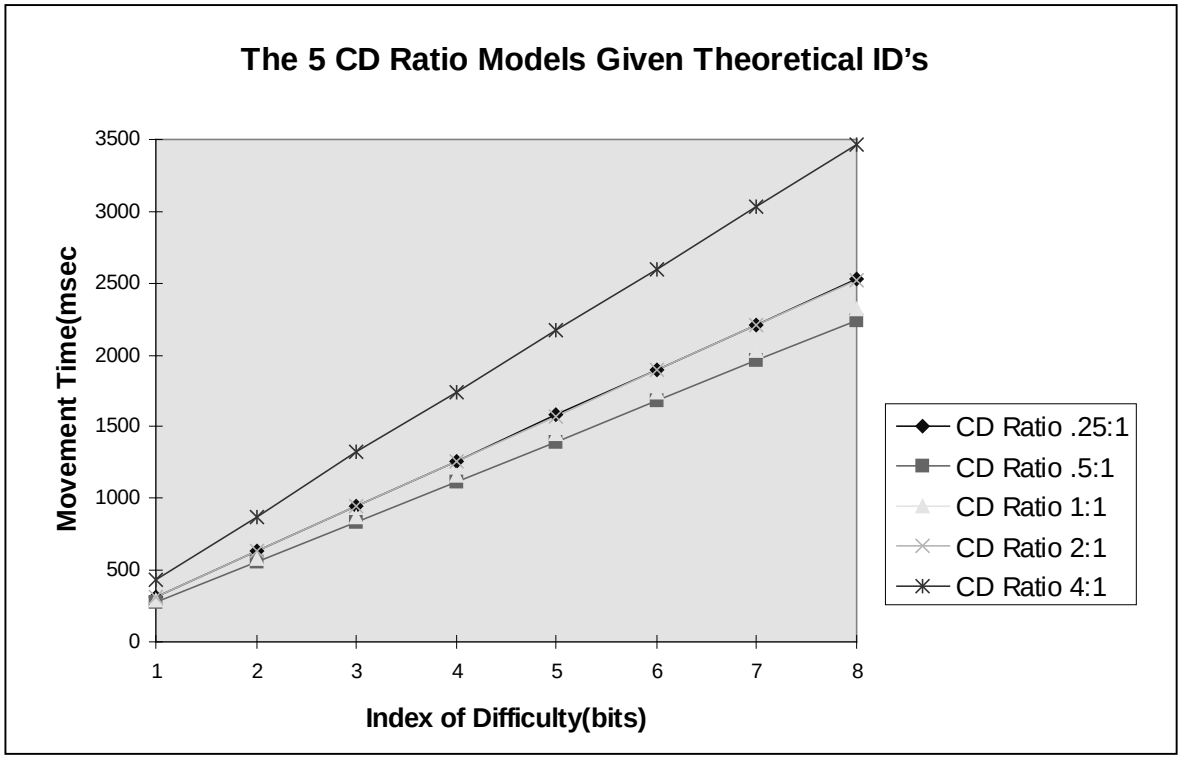

Figure 11. The 5 models plotted together.

to actually click in the target range is minimal. With model 4, it takes very little time to move the mouse pointer to the target area, but when attempting to click in the target area, the loss of precision makes it more difficult to click in the target area resulting in more movement time. So, the apparent reason why model 1 and 4 are so close together is that when adding up the two different parts of the overall movement time, model 1's main contribution comes from getting to the target and model 4's main contribution comes from attempting to click in the target area. It turns out that when adding up the contributions, model 1 and model 4's total movement time are almost identical but the way in which their respective movement times are made up is quite different.

Overall, the higher the CD Ratio, the longer it takes to perform a task. The reason for this claim is quite simple. The higher CD Ratio's speed up the mouse pointer's movement based on comparatively little movement with the actual device. This breeds movement from point 1 to point 2 to be very fast. However, once the desired area of the screen is reached, it takes much more time to actually finish the task. This idea stems from the fact that the precision of the mouse movement is lessened resulting in slower movement times. Since it is more difficult to place the pointer in the exact location needed to finish the task (this is highly apparent with a target area of 2.5 mm), it will take longer to complete the task. So, as a result, the movement time will slow down for these higher CD Ratios.

Conclusion

There is a certain trade off when dealing with CD Ratios and that tradeoff is control versus speed. Using a higher CD Ratio will yield more speed and less control while a lower CD Ratio will yield more control and less speed. Extreme instances of each result in either difficulty or annoyance in performing mouse tasks. This experiment showed that when performing difficult mouse tasks control is off the essence. A high CD Ratio is counterproductive yet a low CD Ratio is difficult to use in that the user is always picking up the mouse and moving back to the center of the mouse pad. Obviously, a middle ground is the key to this argument especially since the CD Ratio's of 1:1 and 0.5:1 gave the best movement time results. Is this a coincidence, since most users have there CD Ratios set somewhere in the range of model's 2 and 3. The answer appears to be that these ratios provide the best productivity and that extreme CD Ratios do not. So, the best CD Ratios to use are ratios that give enough speed to avoid annoyance and enough control to perform precision tasks.

Acknowledgments

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References

[1] Baecker, R. M., Grundin, J., Buxton, W., & Greenberg, S. (1995). Readings in Human Computer Interaction. Morgan-Kaufman, San Francisco, 469-470.

[2] Boritz, J., Booth, K. S., & Cowan, W.B. (1991). Fitts' law studies of directional mouse movement. *Proceedings of Graphical Interface '91,* 216-223. Toronto, Ontario: Canadian Information Processing Society.

[3] Buxton, W. (1990). A three-state model of graphical input. In D. Diaper et al. (Eds.), *Human-Computer Interaction – INTERACT '90,* 449-456. Amsterdam: Elsevier.

[4] Gillan, D. J., Holden, K., Adam, S., Rudskill, M., & Magee, L. (1990). How does Fitts' law fit pointing and dragging? *Proceedings of the CHI '90 Conference on Human Factors in Computing Systems,* 227-234. New York: ACM.

[5] MacKenzie, I. S., & Buxton, W. (1992). Extending Fitts' law to two-dimensional tasks. *Proceedings if the CHI '92 Conference on Human Factors in Computing Systems,* 219-226. New York: ACM.

[6] MacKenzie, I. S., & Buxton, W. (1994). The prediction of pointing and dragging times in graphical user interfaces. *Interacting with Computers, 6,* 213-227.

[7] MacKenzie, I. S. (1994). Fitts' law as a performance model for human-computer interaction. Doctoral dissertation. University of Toronto.

[8] MacKenzie, I. S. (1992b). Movement time prediction in human-computer interfaces. *Proceedings of Graphics Interface '92,* Morgan-Kaufman, 140-150.

[9] Soukeroff, R. W., & MacKenzie, I. S. (1995). Generalized Fitts' law model builder. *Companion Proceedings of the CHI '95 Conference on Human Factors and Computing Systems,* 113-114. New York: ACM.

Appendix A

This appendix contains the raw data collected for this experiment. The appendix is arranged by model. Note that A = amplitude, W = width, CDG = CD Ratio, MoveT = movement time, x and y are how far the subject clicked from the center of the target, and E = error.

Model 1

```
#
#  Data file:    cd25bs1.dat
#  Subject #:    1
#  Session #:    2
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:48 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.2,   1.2,   0.0, 0,     0,  1679
 80.0,   2.5,   2.5,  10.0,  0.2,   0.8,  -1.2, 0,     0,  1762
 80.0,   9.8,   9.8, 150.0,  0.2,  -2.3,  -1.6, 0,     0,  1458
 80.0,   9.8,   9.8,  10.0,  0.2,   0.4,  -2.8, 0,     0,  1410
 80.0,  20.5,  20.5, 150.0,  0.2,  -9.3,  -5.5, 0,     0,  1092
 80.0,  20.5,  20.5,  10.0,  0.2,  -2.7,  -3.2, 0,     0,  1192
160.0,   2.5,   2.5, 150.0,  0.2,  -0.4,  -1.2, 0,     0,  1545
160.0,   2.5,   2.5,  10.0,  0.2,  -0.8,  -0.4, 0,     0,  2099
160.0,   9.8,   9.8, 150.0,  0.2,  -2.3,  -2.8, 0,     0,  1663
160.0,   9.8,   9.8,  10.0,  0.2,  -0.8,  -1.2, 0,     0,  1914
160.0,  20.5,  20.5, 150.0,  0.2,  -8.2,  -6.7, 0,     0,  1243
160.0,  20.5,  20.5,  10.0,  0.2,   3.5,  -8.7, 0,     0,  1041
240.0,   2.5,   2.5, 150.0,  0.2,  -0.4,  -0.4, 0,     0,  2937
240.0,   2.5,   2.5,  10.0,  0.2,  -1.2,  -0.4, 0,     0,  1511
240.0,   9.8,   9.8, 150.0,  0.2,  -1.9,  -0.4, 0,     0,  1713
240.0,   9.8,   9.8,  10.0,  0.2,  -3.5,  -3.5, 0,     0,  1612
240.0,  20.5,  20.5, 150.0,  0.2,  -6.6,  -5.5, 0,     0,  1460
240.0,  20.5,  20.5,  10.0,  0.2,   7.4,  -5.9, 0,     0,  1562

#
#  Data file:    cd25db1.dat
#  Subject #:    5
#  Session #:    1
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:21 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.2,   1.2,   0.8, 0,     0,  1125
 80.0,   2.5,   2.5,  10.0,  0.2,  -0.8,   0.4, 0,     0,  1444
 80.0,   9.8,   9.8, 150.0,  0.2,   0.0,  -2.4, 0,     0,   856
 80.0,   9.8,   9.8,  10.0,  0.2,   0.0,  -1.2, 0,     0,  1024
 80.0,  20.5,  20.5, 150.0,  0.2,   1.2,  -2.4, 0,     0,   840
 80.0,  20.5,  20.5,  10.0,  0.2,  -3.1,  -0.4, 0,     0,   621
160.0,   2.5,   2.5, 150.0,  0.2,   0.4,  -0.8, 0,     0,  1830
160.0,   2.5,   2.5,  10.0,  0.2,   0.0,  -0.4, 0,     0,  1696
160.0,   9.8,   9.8, 150.0,  0.2,  -1.2,   3.2, 0,     0,  1090
160.0,   9.8,   9.8,  10.0,  0.2,  -1.2,  -4.7, 0,     0,  1209
```

```
160.0,  20.5,  20.5, 150.0,  0.2,  -7.4,  -4.7, 1,     0,  1209
160.0,  20.5,  20.5,  10.0,  0.2,   7.8,  -4.7, 0,     0,   890
240.0,   2.5,   2.5, 150.0,  0.2,  -0.4,  -1.2, 0,     0,  1864
240.0,   2.5,   2.5,  10.0,  0.2,  -0.8,  -0.8, 0,     0,  1881
240.0,   9.8,   9.8, 150.0,  0.2,  -1.2,   3.2, 0,     0,  1676
240.0,   9.8,   9.8,  10.0,  0.2,  -3.1,  -2.0, 0,     0,  1511
240.0,  20.5,  20.5, 150.0,  0.2,   1.6,   4.3, 0,     0,  1511
240.0,  20.5,  20.5,  10.0,  0.2,  -3.5,  -5.1, 0,     0,  1058

#
#  Data file:    cd25jl1.dat
#  Subject #:    2
#  Session #:    1
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    23:22 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.2,  -0.4,   0.4, 0,     0,  1259
 80.0,   2.5,   2.5,  10.0,  0.2,   0.0,   0.4, 0,     0,  2217
 80.0,   9.8,   9.8, 150.0,  0.2,  -2.7,  -2.4, 0,     0,  1004
 80.0,   9.8,   9.8,  10.0,  0.2,  -1.9,  -1.2, 0,     0,  1108
 80.0,  20.5,  20.5, 150.0,  0.2,   4.7,   5.1, 0,     0,  1075
 80.0,  20.5,  20.5,  10.0,  0.2,   4.3,  -2.8, 0,     0,   873
160.0,   2.5,   2.5, 150.0,  0.2,   0.4,   0.0, 0,     0,  1948
160.0,   2.5,   2.5,  10.0,  0.2,   0.0,   0.4, 0,     0,  1763
160.0,   9.8,   9.8, 150.0,  0.2,   0.4,   1.6, 0,     0,  1795
160.0,   9.8,   9.8,  10.0,  0.2,  -2.7,   0.4, 0,     0,   890
160.0,  20.5,  20.5, 150.0,  0.2,   4.3,  -0.4, 0,     0,  1158
160.0,  20.5,  20.5,  10.0,  0.2,   1.6,   0.0, 0,     0,  1276
240.0,   2.5,   2.5, 150.0,  0.2,   0.4,   0.0, 0,     0,  2082
240.0,   2.5,   2.5,  10.0,  0.2,   0.0,   0.4, 0,     0,  1578
240.0,   9.8,   9.8, 150.0,  0.2,  -0.8,  -1.2, 0,     0,  1965
240.0,   9.8,   9.8,  10.0,  0.2,   1.6,   0.8, 0,     0,  1662
240.0,  20.5,  20.5, 150.0,  0.2,   3.1,  -7.5, 0,     0,  1646
240.0,  20.5,  20.5,  10.0,  0.2,   1.6,  -6.3, 0,     0,  1410


#  Data file:    cd25js1.dat
#  Subject #:    4
#  Session #:    1
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:13 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.2,  -0.4,  -0.8, 0,     0,  1863
 80.0,   2.5,   2.5,  10.0,  0.2,  -0.8,  -0.4, 0,     0,  1309
 80.0,   9.8,   9.8, 150.0,  0.2,  -0.8,  -1.6, 0,     0,   806
 80.0,   9.8,   9.8,  10.0,  0.2,  -0.8,  -1.2, 0,     0,  1058
 80.0,  20.5,  20.5, 150.0,  0.2,  -0.4,  -4.7, 0,     0,   520
 80.0,  20.5,  20.5,  10.0,  0.2,  -2.7,  -3.2, 0,     0,   722
160.0,   2.5,   2.5, 150.0,  0.2,  -0.4,   0.0, 0,     0,  1410
160.0,   2.5,   2.5,  10.0,  0.2,  -0.8,   0.0, 0,     0,  1931
160.0,   9.8,   9.8, 150.0,  0.2,  -3.5,  -3.2, 0,     0,   990
160.0,   9.8,   9.8,  10.0,  0.2,   3.1,  -0.8, 0,     0,   923
160.0,  20.5,  20.5, 150.0,  0.2,   4.7,   4.7, 0,     0,  1326
160.0,  20.5,  20.5,  10.0,  0.2,   3.5,  -3.5, 0,     0,  1410
240.0,   2.5,   2.5, 150.0,  0.2,   0.0,   0.0, 0,     0,  2098
```

```
240.0,   2.5,   2.5,  10.0,  0.2,   0.0,   0.4, 0,     0,  2451
240.0,   9.8,   9.8, 150.0,  0.2,  -0.8,  -1.6, 0,     0,  1326
240.0,   9.8,   9.8,  10.0,  0.2,  -1.9,  -0.4, 0,     0,  1527
240.0,  20.5,  20.5, 150.0,  0.2,   5.8,  -3.9, 0,     0,  1276
240.0,  20.5,  20.5,  10.0,  0.2,   6.2,   3.9, 0,     0,  1393

#
#  Data file:    cd25rv1.dat
#  Subject #:    3
#  Session #:    2
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    00:34 on Sunday November 17, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.2,   0.0,   0.0, 0,     0,  1310
 80.0,   2.5,   2.5,  10.0,  0.2,  -0.4,   0.4, 0,     0,  2721
 80.0,   9.8,   9.8, 150.0,  0.2,   1.6,   3.2, 0,     0,  1058
 80.0,   9.8,   9.8,  10.0,  0.2,  -0.8,   2.8, 0,     0,  1461
 80.0,  20.5,  20.5, 150.0,  0.2,  -3.5,  -4.7, 0,     0,   722
 80.0,  20.5,  20.5,  10.0,  0.2,   7.8,   0.4, 0,     0,   638
160.0,   2.5,   2.5, 150.0,  0.2,   1.2,   0.4, 0,     0,  1864
160.0,   2.5,   2.5,  10.0,  0.2,   0.0,   0.4, 0,     0,  1326
160.0,   9.8,   9.8, 150.0,  0.2,  -2.3,  -3.9, 0,     0,  1226
160.0,   9.8,   9.8,  10.0,  0.2,   4.7,  -0.4, 0,     0,  1394
160.0,  20.5,  20.5, 150.0,  0.2,   3.5,   3.2, 0,     0,  1008
160.0,  20.5,  20.5,  10.0,  0.2,  -1.2,  -5.9, 0,     0,   823
240.0,   2.5,   2.5, 150.0,  0.2,   0.4,   0.0, 0,     0,  2015
240.0,   2.5,   2.5,  10.0,  0.2,   0.8,  -0.4, 0,     0,  1458
240.0,   9.8,   9.8, 150.0,  0.2,   0.4,  -1.2, 0,     0,  1411
240.0,   9.8,   9.8,  10.0,  0.2,  -1.2,  -2.4, 0,     0,  1006
240.0,  20.5,  20.5, 150.0,  0.2,  -5.0,  -8.7, 0,     0,  1931
240.0,  20.5,  20.5,  10.0,  0.2,  -1.2,  -7.1, 0,     0,   940
```

Model 2

```
#
#  Data file:    cd05bs1.dat
#  Subject #:    1
#  Session #:    3
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:51 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.5,   0.0,  -0.4, 0,     0,  1209
 80.0,   2.5,   2.5,  10.0,  0.5,   0.4,   0.4, 0,     0,  1394
 80.0,   9.8,   9.8, 150.0,  0.5,  -2.7,   0.4, 0,     0,   940
 80.0,   9.8,   9.8,  10.0,  0.5,   2.3,   0.4, 0,     0,  1344
 80.0,  20.5,  20.5, 150.0,  0.5,  -3.5,  -8.3, 0,     0,   771
 80.0,  20.5,  20.5,  10.0,  0.5,   5.0,  -2.4, 0,     0,   890
160.0,   2.5,   2.5, 150.0,  0.5,  -0.4,   0.0, 0,     0,  1867
160.0,   2.5,   2.5,  10.0,  0.5,   0.4,   0.0, 0,     0,  1814
160.0,   9.8,   9.8, 150.0,  0.5,  -2.7,  -0.4, 0,     0,  1478
160.0,   9.8,   9.8,  10.0,  0.5,  -3.1,  -0.4, 0,     0,  1646
160.0,  20.5,  20.5, 150.0,  0.5,   1.2,   5.1, 0,     0,  1142
160.0,  20.5,  20.5,  10.0,  0.5,  -3.5,  -1.2, 0,     0,  1394
240.0,   2.5,   2.5, 150.0,  0.5,  -0.4,   0.4, 0,     0,  2015
240.0,   2.5,   2.5,  10.0,  0.5,  -1.2,  -0.8, 0,     0,  1797
```

```
240.0,   9.8,   9.8, 150.0,  0.5,  -2.7,  -1.2, 0,     0,  1478
240.0,   9.8,   9.8,  10.0,  0.5,  -1.9,  -3.2, 0,     0,  1292
240.0,  20.5,  20.5, 150.0,  0.5,  -4.3,  -2.0, 0,     0,  1275
240.0,  20.5,  20.5,  10.0,  0.5,  -3.5,  -5.9, 0,     0,  1141

#
#  Data file:    cd05db1.dat
#  Subject #:    5
#  Session #:    2
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:22 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.5,  -1.2,   0.4, 0,     0,  1260
 80.0,   2.5,   2.5,  10.0,  0.5,   0.0,   0.0, 0,     0,  1512
 80.0,   9.8,   9.8, 150.0,  0.5,  -2.3,  -2.8, 0,     0,   772
 80.0,   9.8,   9.8,  10.0,  0.5,  -2.3,   0.8, 0,     0,   991
 80.0,  20.5,  20.5, 150.0,  0.5,  -6.6,  -4.3, 0,     0,   772
 80.0,  20.5,  20.5,  10.0,  0.5,  -4.7,  -2.0, 0,     0,  1108
160.0,   2.5,   2.5, 150.0,  0.5,  -0.8,  -0.4, 0,     0,  2301
160.0,   2.5,   2.5,  10.0,  0.5,  -0.4,   0.4, 0,     0,  1226
160.0,   9.8,   9.8, 150.0,  0.5,  -0.4,   1.2, 0,     0,  1058
160.0,   9.8,   9.8,  10.0,  0.5,   2.3,   0.8, 0,     0,  1327
160.0,  20.5,  20.5, 150.0,  0.5,  -0.8,  -4.3, 0,     0,   856
160.0,  20.5,  20.5,  10.0,  0.5,  -5.8,  -4.7, 0,     0,   873
240.0,   2.5,   2.5, 150.0,  0.5,  -0.4,   0.4, 0,     0,  1360
240.0,   2.5,   2.5,  10.0,  0.5,   0.4,  -0.4, 0,     0,  1713
240.0,   9.8,   9.8, 150.0,  0.5,  -4.7,  -3.2, 0,     0,  1727
240.0,   9.8,   9.8,  10.0,  0.5,   0.4,  -0.8, 0,     0,  1528
240.0,  20.5,  20.5, 150.0,  0.5,  -6.6,  -6.7, 0,     0,  1108
240.0,  20.5,  20.5,  10.0,  0.5,   2.7,  -6.3, 0,     0,  1041

#
#  Data file:    cd05jl1.dat
#  Subject #:    2
#  Session #:    2
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    23:23 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.5,   0.0,   0.0, 0,     0,  1444
 80.0,   2.5,   2.5,  10.0,  0.5,   0.4,  -0.8, 0,     0,  1411
 80.0,   9.8,   9.8, 150.0,  0.5,   0.0,  -1.2, 0,     0,   890
 80.0,   9.8,   9.8,  10.0,  0.5,   0.8,  -1.6, 0,     0,   856
 80.0,  20.5,  20.5, 150.0,  0.5,  -0.4,   2.8, 0,     0,   823
 80.0,  20.5,  20.5,  10.0,  0.5,   1.6,  -2.0, 0,     0,   671
160.0,   2.5,   2.5, 150.0,  0.5,   0.4,   0.0, 0,     0,  1662
160.0,   2.5,   2.5,  10.0,  0.5,  -0.4,   0.4, 0,     0,  1461
160.0,   9.8,   9.8, 150.0,  0.5,   1.2,   0.8, 0,     0,  1209
160.0,   9.8,   9.8,  10.0,  0.5,   0.8,  -0.4, 0,     0,  1174
160.0,  20.5,  20.5, 150.0,  0.5,  -1.9,  -3.2, 0,     0,  1075
160.0,  20.5,  20.5,  10.0,  0.5,  -0.8,  -0.4, 0,     0,  1209
240.0,   2.5,   2.5, 150.0,  0.5,  -0.4,   0.0, 1,     0,  3123
240.0,   2.5,   2.5,  10.0,  0.5,  -0.4,   0.4, 0,     0,  1377
240.0,   9.8,   9.8, 150.0,  0.5,  -1.9,  -1.2, 0,     0,  1041
240.0,   9.8,   9.8,  10.0,  0.5,   1.6,  -1.6, 0,     0,  1226
240.0,  20.5,  20.5, 150.0,  0.5,   5.0,  -3.2, 0,     0,  1074
```

```
240.0,  20.5,  20.5,  10.0,  0.5,   0.4,  -2.0, 0,     0,   822

#
#  Data file:    cd05js1.dat
#  Subject #:    4
#  Session #:    2
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:14 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.5,   0.0,   0.4, 0,     0,  1394
 80.0,   2.5,   2.5,  10.0,  0.5,   0.0,   0.4, 0,     0,  1377
 80.0,   9.8,   9.8, 150.0,  0.5,   1.9,   0.8, 0,     0,   989
 80.0,   9.8,   9.8,  10.0,  0.5,  -1.2,  -0.4, 0,     0,   737
 80.0,  20.5,  20.5, 150.0,  0.5,   5.0,   3.5, 0,     0,   854
 80.0,  20.5,  20.5,  10.0,  0.5,  -3.9,  -2.8, 0,     0,   738
160.0,   2.5,   2.5, 150.0,  0.5,   0.0,   0.0, 0,     0,  1561
160.0,   2.5,   2.5,  10.0,  0.5,   0.4,   0.4, 0,     0,  1679
160.0,   9.8,   9.8, 150.0,  0.5,  -1.2,  -0.4, 0,     0,  1075
160.0,   9.8,   9.8,  10.0,  0.5,   1.6,   1.2, 0,     0,  1004
160.0,  20.5,  20.5, 150.0,  0.5,   3.5,  -0.4, 0,     0,  1041
160.0,  20.5,  20.5,  10.0,  0.5,  -5.0,  -2.0, 0,     0,  1073
240.0,   2.5,   2.5, 150.0,  0.5,   0.0,   0.0, 0,     0,  1712
240.0,   2.5,   2.5,  10.0,  0.5,  -0.4,   0.4, 0,     0,  1847
240.0,   9.8,   9.8, 150.0,  0.5,  -1.9,  -1.6, 0,     0,   856
240.0,   9.8,   9.8,  10.0,  0.5,  -2.7,  -2.0, 0,     0,  1041
240.0,  20.5,  20.5, 150.0,  0.5,   0.0,  -1.2, 0,     0,  1125
240.0,  20.5,  20.5,  10.0,  0.5,   7.4,  -0.4, 0,     0,  1024

#
#  Data file:    cd05rv1.dat
#  Subject #:    3
#  Session #:    3
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    00:36 on Sunday November 17, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  0.5,  -0.4,   1.2, 0,     0,  1495
 80.0,   2.5,   2.5,  10.0,  0.5,  -0.8,  -0.4, 0,     0,  1646
 80.0,   9.8,   9.8, 150.0,  0.5,   0.4,   0.4, 0,     0,   873
 80.0,   9.8,   9.8,  10.0,  0.5,   0.0,  -0.8, 0,     0,  1225
 80.0,  20.5,  20.5, 150.0,  0.5,  -6.2,  -5.1, 0,     0,   705
 80.0,  20.5,  20.5,  10.0,  0.5,   5.0,  -0.8, 0,     0,   722
160.0,   2.5,   2.5, 150.0,  0.5,   0.4,   0.0, 0,     0,  1427
160.0,   2.5,   2.5,  10.0,  0.5,   0.8,   0.0, 0,     0,  1427
160.0,   9.8,   9.8, 150.0,  0.5,  -3.1,  -2.0, 0,     0,   789
160.0,   9.8,   9.8,  10.0,  0.5,  -0.4,  -4.3, 0,     0,  1007
160.0,  20.5,  20.5, 150.0,  0.5,   2.3,   5.9, 0,     0,  1293
160.0,  20.5,  20.5,  10.0,  0.5,  -3.5,  -4.7, 0,     0,   890
240.0,   2.5,   2.5, 150.0,  0.5,  -0.8,   0.8, 0,     0,  1931
240.0,   2.5,   2.5,  10.0,  0.5,   0.8,  -0.4, 0,     0,  1174
240.0,   9.8,   9.8, 150.0,  0.5,   0.0,   2.0, 0,     0,  1159
240.0,   9.8,   9.8,  10.0,  0.5,   0.8,   1.2, 0,     0,  1159
240.0,  20.5,  20.5, 150.0,  0.5,  -2.7,   4.3, 0,     0,  1092
240.0,  20.5,  20.5,  10.0,  0.5,   3.5,   6.3, 0,     0,  1125
```

Model 3

```
#
#  Data file:    cd1bs1.dat
#  Subject #:    1
#  Session #:    1
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:47 on Friday November 15, 1996
#
#   A,     W,     H,     th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  1.0,   0.4,   1.2, 0,     0,  1897
 80.0,   2.5,   2.5,  10.0,  1.0,  -0.4,   0.0, 0,     0,  1596
 80.0,   9.8,   9.8, 150.0,  1.0,   1.6,  -1.6, 0,     0,  1360
 80.0,   9.8,   9.8,  10.0,  1.0,   2.3,   0.4, 0,     0,  1343
 80.0,  20.5,  20.5, 150.0,  1.0,  -3.5,  -5.9, 0,     0,   840
 80.0,  20.5,  20.5,  10.0,  1.0,  -5.8,  -3.5, 0,     0,   940
160.0,   2.5,   2.5, 150.0,  1.0,   0.0,   0.0, 0,     0,  1830
160.0,   2.5,   2.5,  10.0,  1.0,  -0.4,  -0.4, 0,     0,  1561
160.0,   9.8,   9.8, 150.0,  1.0,  -2.7,  -3.2, 0,     0,   991
160.0,   9.8,   9.8,  10.0,  1.0,  -3.1,  -2.0, 0,     0,  1007
160.0,  20.5,  20.5, 150.0,  1.0,  -7.4,  -6.7, 0,     0,  1175
160.0,  20.5,  20.5,  10.0,  1.0,   5.0,  -1.2, 0,     0,  1745
240.0,   2.5,   2.5, 150.0,  1.0,   0.0,   1.2, 0,     0,  2032
240.0,   2.5,   2.5,  10.0,  1.0,   0.4,   0.0, 0,     0,  1780
240.0,   9.8,   9.8, 150.0,  1.0,  -0.4,  -2.0, 0,     0,  1696
240.0,   9.8,   9.8,  10.0,  1.0,   1.6,   1.2, 0,     0,  1528
240.0,  20.5,  20.5, 150.0,  1.0,   1.2,   3.2, 0,     0,  1226
240.0,  20.5,  20.5,  10.0,  1.0,   0.0,  -6.7, 0,     0,  1092

#
#  Data file:    cd1db1.dat
#  Subject #:    5
#  Session #:    3
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:23 on Monday November 18, 1996
#
#   A,     W,     H,     th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  1.0,  -0.8,   0.4, 1,     0,  2351
 80.0,   2.5,   2.5,  10.0,  1.0,  -0.4,   0.0, 1,     0,  2250
 80.0,   9.8,   9.8, 150.0,  1.0,  -0.8,   3.2, 0,     0,   705
 80.0,   9.8,   9.8,  10.0,  1.0,   0.4,   1.2, 0,     0,  1159
 80.0,  20.5,  20.5, 150.0,  1.0,   7.0,  -1.2, 0,     0,   705
 80.0,  20.5,  20.5,  10.0,  1.0,  -0.8,  -4.3, 0,     0,   688
160.0,   2.5,   2.5, 150.0,  1.0,   0.4,  -0.4, 0,     0,  2217
160.0,   2.5,   2.5,  10.0,  1.0,  -0.4,   0.4, 0,     0,  1444
160.0,   9.8,   9.8, 150.0,  1.0,  -2.7,   0.0, 0,     0,  1444
160.0,   9.8,   9.8,  10.0,  1.0,  -3.9,   1.2, 0,     0,  1024
160.0,  20.5,  20.5, 150.0,  1.0,  -0.8,  -4.7, 0,     0,   873
160.0,  20.5,  20.5,  10.0,  1.0,   1.9,   3.5, 0,     0,   755
240.0,   2.5,   2.5, 150.0,  1.0,   1.2,   0.4, 0,     0,  1627
240.0,   2.5,   2.5,  10.0,  1.0,  -0.8,   0.4, 0,     0,  1545
240.0,   9.8,   9.8, 150.0,  1.0,  -1.9,   0.8, 0,     0,  1310
240.0,   9.8,   9.8,  10.0,  1.0,  -3.1,  -1.6, 0,     0,  1041
240.0,  20.5,  20.5, 150.0,  1.0,  -3.5,  -5.1, 0,     0,  1041
240.0,  20.5,  20.5,  10.0,  1.0,   5.0,  -3.9, 0,     0,  1092
```

```
#
#  Data file:    cd1jl1.dat
#  Subject #:    2
#  Session #:    3
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    23:24 on Friday November 15, 1996
#
#   A,      W,      H,     th,   CDG,      x,      y, E,  HomeT,  MoveT
 80.0,    2.5,    2.5, 150.0,   1.0,    0.0,   -0.4, 0,      0,   1142
 80.0,    2.5,    2.5,  10.0,   1.0,    0.0,    0.0, 0,      0,   1189
 80.0,    9.8,    9.8, 150.0,   1.0,   -1.2,    0.0, 0,      0,   1058
 80.0,    9.8,    9.8,  10.0,   1.0,    1.6,    0.0, 0,      0,    755
 80.0,   20.5,   20.5, 150.0,   1.0,    1.9,    2.0, 0,      0,    756
 80.0,   20.5,   20.5,  10.0,   1.0,   -1.9,   -0.8, 0,      0,    806
160.0,    2.5,    2.5, 150.0,   1.0,    0.4,    0.8, 0,      0,   1276
160.0,    2.5,    2.5,  10.0,   1.0,   -0.4,   -0.4, 0,      0,   1394
160.0,    9.8,    9.8, 150.0,   1.0,   -2.3,   -0.8, 0,      0,   1005
160.0,    9.8,    9.8,  10.0,   1.0,   -0.8,   -0.8, 0,      0,   1360
160.0,   20.5,   20.5, 150.0,   1.0,   -7.4,   -2.0, 0,      0,   1410
160.0,   20.5,   20.5,  10.0,   1.0,   -0.8,    1.6, 0,      0,   1226
240.0,    2.5,    2.5, 150.0,   1.0,    0.8,    0.4, 0,      0,   1629
240.0,    2.5,    2.5,  10.0,   1.0,   -0.4,   -0.4, 1,      0,   2233
240.0,    9.8,    9.8, 150.0,   1.0,    0.8,    0.0, 0,      0,   1209
240.0,    9.8,    9.8,  10.0,   1.0,    0.8,   -1.2, 0,      0,   1545
240.0,   20.5,   20.5, 150.0,   1.0,    3.1,   -2.8, 0,      0,    823
240.0,   20.5,   20.5,  10.0,   1.0,   -1.6,    1.6, 0,      0,    789

#
#  Data file:    cd1js1.dat
#  Subject #:    4
#  Session #:    3
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:15 on Monday November 18, 1996
#
#   A,      W,      H,     th,   CDG,      x,      y, E,  HomeT,  MoveT
 80.0,    2.5,    2.5, 150.0,   1.0,   -0.8,    0.8, 1,      0,   1662
 80.0,    2.5,    2.5,  10.0,   1.0,    0.0,    0.4, 0,      0,   1192
 80.0,    9.8,    9.8, 150.0,   1.0,    0.0,   -2.4, 0,      0,    604
 80.0,    9.8,    9.8,  10.0,   1.0,   -0.8,    0.8, 0,      0,    991
 80.0,   20.5,   20.5, 150.0,   1.0,   -5.0,   -5.5, 0,      0,    702
 80.0,   20.5,   20.5,  10.0,   1.0,   -5.8,    2.8, 0,      0,    973
160.0,    2.5,    2.5, 150.0,   1.0,    0.0,   -0.4, 0,      0,   1629
160.0,    2.5,    2.5,  10.0,   1.0,   -0.4,    0.0, 0,      0,   1073
160.0,    9.8,    9.8, 150.0,   1.0,    1.6,   -0.8, 0,      0,   1394
160.0,    9.8,    9.8,  10.0,   1.0,    1.6,    2.4, 0,      0,    839
160.0,   20.5,   20.5, 150.0,   1.0,    6.2,   -7.5, 0,      0,    755
160.0,   20.5,   20.5,  10.0,   1.0,   -4.3,   -6.7, 0,      0,    755
240.0,    2.5,    2.5, 150.0,   1.0,    0.0,    0.0, 0,      0,   1410
240.0,    2.5,    2.5,  10.0,   1.0,    0.0,    0.4, 0,      0,   1309
240.0,    9.8,    9.8, 150.0,   1.0,   -3.5,    0.0, 0,      0,   1108
240.0,    9.8,    9.8,  10.0,   1.0,    0.4,   -0.4, 0,      0,   1612
240.0,   20.5,   20.5, 150.0,   1.0,    0.0,    2.0, 0,      0,   1410
240.0,   20.5,   20.5,  10.0,   1.0,   -0.4,   -5.5, 0,      0,    789

#
#  Data file:    cd1rv1.dat
#  Subject #:    3
```

```
#  Session #:    1
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    00:32 on Sunday November 17, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  1.0,   0.4,   0.8, 0,     0,  1981
 80.0,   2.5,   2.5,  10.0,  1.0,   1.2,   0.4, 1,     0,  2032
 80.0,   9.8,   9.8, 150.0,  1.0,   0.0,  -0.8, 0,     0,  1075
 80.0,   9.8,   9.8,  10.0,  1.0,  -1.6,   1.6, 0,     0,  1142
 80.0,  20.5,  20.5, 150.0,  1.0,   5.4,   3.5, 0,     0,   938
 80.0,  20.5,  20.5,  10.0,  1.0,   0.0,   0.8, 0,     0,   739
160.0,   2.5,   2.5, 150.0,  1.0,  -0.4,   0.4, 0,     0,  1427
160.0,   2.5,   2.5,  10.0,  1.0,   0.0,   0.0, 0,     0,  1327
160.0,   9.8,   9.8, 150.0,  1.0,   0.8,   0.8, 0,     0,  1965
160.0,   9.8,   9.8,  10.0,  1.0,   0.0,   0.8, 0,     0,  1092
160.0,  20.5,  20.5, 150.0,  1.0,  -7.0,   1.6, 0,     0,  1243
160.0,  20.5,  20.5,  10.0,  1.0,   4.7,  -0.4, 0,     0,   957
240.0,   2.5,   2.5, 150.0,  1.0,   0.8,   0.0, 0,     0,  1545
240.0,   2.5,   2.5,  10.0,  1.0,  -1.2,   0.4, 0,     0,  2149
240.0,   9.8,   9.8, 150.0,  1.0,  -3.9,   2.8, 0,     0,  1290
240.0,   9.8,   9.8,  10.0,  1.0,  -1.9,  -1.2, 0,     0,  1107
240.0,  20.5,  20.5, 150.0,  1.0,   2.3,   2.4, 0,     0,  1293
240.0,  20.5,  20.5,  10.0,  1.0,   0.0,  -5.5, 0,     0,  1276
```

Model 4

```
#
#  Data file:    cd2bs1.dat
#  Subject #:    1
#  Session #:    4
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:52 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.4, 0,     0,  2285
 80.0,   2.5,   2.5,  10.0,  2.0,   0.0,  -0.4, 0,     0,  1512
 80.0,   9.8,   9.8, 150.0,  2.0,  -3.9,   0.8, 0,     0,   823
 80.0,   9.8,   9.8,  10.0,  2.0,   1.6,  -0.4, 0,     0,  1310
 80.0,  20.5,  20.5, 150.0,  2.0,  -3.9,  -2.8, 0,     0,  1310
 80.0,  20.5,  20.5,  10.0,  2.0,  -3.1,  -1.6, 0,     0,   739
160.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.0, 0,     0,  2217
160.0,   2.5,   2.5,  10.0,  2.0,  -0.8,   0.0, 1,     0,  3863
160.0,   9.8,   9.8, 150.0,  2.0,  -3.9,  -3.5, 0,     0,   890
160.0,   9.8,   9.8,  10.0,  2.0,  -3.1,   3.2, 0,     0,  1291
160.0,  20.5,  20.5, 150.0,  2.0,   1.6,  -2.8, 0,     0,  1529
160.0,  20.5,  20.5,  10.0,  2.0,   6.2,  -1.2, 0,     0,  1310
240.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.0, 0,     0,  1865
240.0,   2.5,   2.5,  10.0,  2.0,   0.8,   0.8, 0,     0,  1797
240.0,   9.8,   9.8, 150.0,  2.0,   0.8,  -0.4, 0,     0,  1444
240.0,   9.8,   9.8,  10.0,  2.0,  -3.1,   3.2, 0,     0,  1260
240.0,  20.5,  20.5, 150.0,  2.0,   3.9,  -3.2, 0,     0,   823
240.0,  20.5,  20.5,  10.0,  2.0,  -3.1,  -2.4, 0,     0,   756

#
#  Data file:    cd2db1.dat
#  Subject #:    5
```

```
#  Session #:    4
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:24 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.0, 1,     0,  3443
 80.0,   2.5,   2.5,  10.0,  2.0,   0.0,   0.4, 0,     0,  1813
 80.0,   9.8,   9.8, 150.0,  2.0,   0.8,   1.2, 0,     0,   772
 80.0,   9.8,   9.8,  10.0,  2.0,   1.6,  -1.2, 0,     0,  1259
 80.0,  20.5,  20.5, 150.0,  2.0,  -3.1,  -0.4, 0,     0,   890
 80.0,  20.5,  20.5,  10.0,  2.0,  -3.1,  -2.8, 0,     0,  1108
160.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.0, 0,     0,  3611
160.0,   2.5,   2.5,  10.0,  2.0,   0.0,  -0.4, 1,     0,  2939
160.0,   9.8,   9.8, 150.0,  2.0,  -3.5,  -0.8, 0,     0,  1797
160.0,   9.8,   9.8,  10.0,  2.0,   0.0,   0.4, 0,     0,  1075
160.0,  20.5,  20.5, 150.0,  2.0,  -2.3,   0.0, 0,     0,  1226
160.0,  20.5,  20.5,  10.0,  2.0,  -5.4,  -0.4, 0,     0,   940
240.0,   2.5,   2.5, 150.0,  2.0,  -0.8,  -0.4, 0,     0,  2402
240.0,   2.5,   2.5,  10.0,  2.0,  -0.8,   0.8, 0,     0,  1595
240.0,   9.8,   9.8, 150.0,  2.0,  -3.1,  -1.2, 0,     0,  1545
240.0,   9.8,   9.8,  10.0,  2.0,  -2.3,   0.0, 0,     0,  1696
240.0,  20.5,  20.5, 150.0,  2.0,  -6.2,  -2.8, 0,     0,  1310
240.0,  20.5,  20.5,  10.0,  2.0,   0.0,  -0.4, 0,     0,   890

#
#  Data file:    cd2jl1.dat
#  Subject #:    2
#  Session #:    4
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    23:25 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  2.0,  -0.8,   0.4, 0,     0,  1511
 80.0,   2.5,   2.5,  10.0,  2.0,  -0.8,  -0.4, 1,     0,  2704
 80.0,   9.8,   9.8, 150.0,  2.0,  -0.8,  -3.2, 0,     0,   873
 80.0,   9.8,   9.8,  10.0,  2.0,   2.3,  -1.2, 0,     0,   937
 80.0,  20.5,  20.5, 150.0,  2.0,  -7.0,  -2.8, 0,     0,   839
 80.0,  20.5,  20.5,  10.0,  2.0,  -3.1,   4.3, 0,     0,   873
160.0,   2.5,   2.5, 150.0,  2.0,   0.8,   0.4, 0,     0,  1713
160.0,   2.5,   2.5,  10.0,  2.0,  -0.8,   0.4, 1,     0,  2384
160.0,   9.8,   9.8, 150.0,  2.0,  -1.9,   1.2, 0,     0,  1192
160.0,   9.8,   9.8,  10.0,  2.0,  -0.8,   1.2, 0,     0,  1259
160.0,  20.5,  20.5, 150.0,  2.0,  -0.4,  -0.4, 0,     0,  1092
160.0,  20.5,  20.5,  10.0,  2.0,  -1.6,  -1.2, 0,     0,  1007
240.0,   2.5,   2.5, 150.0,  2.0,   0.0,   0.0, 0,     0,  1595
240.0,   2.5,   2.5,  10.0,  2.0,  -0.8,   0.4, 0,     0,  1643
240.0,   9.8,   9.8, 150.0,  2.0,  -4.7,  -0.8, 0,     0,  1579
240.0,   9.8,   9.8,  10.0,  2.0,   0.0,   0.4, 0,     0,  1159
240.0,  20.5,  20.5, 150.0,  2.0,  -0.8,  -3.5, 0,     0,   890
240.0,  20.5,  20.5,  10.0,  2.0,   2.3,  -2.4, 0,     0,   940

#
#  Data file:    cd2js1.dat
#  Subject #:    4
#  Session #:    4
#  Subject Name:
#  Sitting #:    1
```

```
#  Date/Time:    14:16 on Monday November 18, 1996
#
#   A,      W,      H,     th,   CDG,      x,      y, E,  HomeT,  MoveT
 80.0,    2.5,    2.5, 150.0,   2.0,    0.0,    0.4, 0,      0,   1679
 80.0,    2.5,    2.5,  10.0,   2.0,   -0.8,    0.4, 0,      0,   1158
 80.0,    9.8,    9.8, 150.0,   2.0,   -2.3,   -0.4, 0,      0,   1158
 80.0,    9.8,    9.8,  10.0,   2.0,   -3.1,    0.0, 0,      0,   1057
 80.0,   20.5,   20.5, 150.0,   2.0,   -4.7,    0.4, 0,      0,    955
 80.0,   20.5,   20.5,  10.0,   2.0,   -5.4,    1.2, 0,      0,    638
160.0,    2.5,    2.5, 150.0,   2.0,   -0.4,   -0.4, 0,      0,   1494
160.0,    2.5,    2.5,  10.0,   2.0,   -0.8,   -0.4, 0,      0,   2099
160.0,    9.8,    9.8, 150.0,   2.0,   -3.1,    2.4, 0,      0,    957
160.0,    9.8,    9.8,  10.0,   2.0,    0.8,   -0.4, 0,      0,   1058
160.0,   20.5,   20.5, 150.0,   2.0,    3.1,   -3.9, 0,      0,    907
160.0,   20.5,   20.5,  10.0,   2.0,   -3.9,   -0.8, 0,      0,    921
240.0,    2.5,    2.5, 150.0,   2.0,    0.0,   -0.4, 0,      0,   2284
240.0,    2.5,    2.5,  10.0,   2.0,    0.0,    0.4, 1,      0,   3105
240.0,    9.8,    9.8, 150.0,   2.0,    1.6,    0.0, 0,      0,    907
240.0,    9.8,    9.8,  10.0,   2.0,    1.6,    1.2, 0,      0,    974
240.0,   20.5,   20.5, 150.0,   2.0,   -7.0,   -1.2, 0,      0,    804
240.0,   20.5,   20.5,  10.0,   2.0,    1.6,   -1.2, 0,      0,    974

#
#  Data file:    cd2rv1.dat
#  Subject #:    3
#  Session #:    4
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    00:37 on Sunday November 17, 1996
#
#   A,      W,      H,     th,   CDG,      x,      y, E,  HomeT,  MoveT
 80.0,    2.5,    2.5, 150.0,   2.0,    0.0,    0.0, 0,      0,   1881
 80.0,    2.5,    2.5,  10.0,   2.0,    0.0,    0.0, 0,      0,   1176
 80.0,    9.8,    9.8, 150.0,   2.0,   -1.6,    0.4, 0,      0,   1058
 80.0,    9.8,    9.8,  10.0,   2.0,    2.3,    0.8, 0,      0,   1310
 80.0,   20.5,   20.5, 150.0,   2.0,    2.3,   -0.8, 0,      0,    890
 80.0,   20.5,   20.5,  10.0,   2.0,   -3.1,    1.6, 0,      0,    756
160.0,    2.5,    2.5, 150.0,   2.0,    0.8,    0.4, 0,      0,   1797
160.0,    2.5,    2.5,  10.0,   2.0,   -0.8,   -0.4, 0,      0,   1713
160.0,    9.8,    9.8, 150.0,   2.0,   -3.5,   -1.2, 0,      0,   1562
160.0,    9.8,    9.8,  10.0,   2.0,    2.3,   -0.4, 0,      0,   1881
160.0,   20.5,   20.5, 150.0,   2.0,    2.3,    1.2, 0,      0,   1008
160.0,   20.5,   20.5,  10.0,   2.0,   -0.8,   -0.8, 0,      0,    890
240.0,    2.5,    2.5, 150.0,   2.0,    0.0,   -0.8, 0,      0,   2284
240.0,    2.5,    2.5,  10.0,   2.0,    0.8,    0.4, 0,      0,   2066
240.0,    9.8,    9.8, 150.0,   2.0,    0.8,   -0.8, 0,      0,   1226
240.0,    9.8,    9.8,  10.0,   2.0,   -0.8,    1.6, 0,      0,   1108
240.0,   20.5,   20.5, 150.0,   2.0,  -10.9,   -6.7, 0,      0,   1411
240.0,   20.5,   20.5,  10.0,   2.0,    2.3,    0.0, 0,      0,    907
```

Model 5

```
#
#  Data file:    cd4bs1.dat
#  Subject #:    1
#  Session #:    5
#  Subject Name:
#  Sitting #:    1
```

```
#  Date/Time:    14:53 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  4.0,  -0.8,  -0.8, 0,     0,  1898
 80.0,   2.5,   2.5,  10.0,  4.0,   0.8,  -0.8, 1,     0,  2688
 80.0,   9.8,   9.8, 150.0,  4.0,   0.8,   0.0, 0,     0,  1579
 80.0,   9.8,   9.8,  10.0,  4.0,  -0.8,  -3.2, 0,     0,   705
 80.0,  20.5,  20.5, 150.0,  4.0,  -3.9,  -1.6, 0,     0,   722
 80.0,  20.5,  20.5,  10.0,  4.0,   2.3,  -5.5, 0,     0,  1024
160.0,   2.5,   2.5, 150.0,  4.0,   0.0,  -0.8, 0,     0,  2284
160.0,   2.5,   2.5,  10.0,  4.0,   0.0,  -0.8, 1,     0,  2721
160.0,   9.8,   9.8, 150.0,  4.0,  -3.1,  -2.4, 0,     0,  1293
160.0,   9.8,   9.8,  10.0,  4.0,   2.3,  -2.4, 0,     0,   972
160.0,  20.5,  20.5, 150.0,  4.0,  -7.4,   3.9, 0,     0,  1342
160.0,  20.5,  20.5,  10.0,  4.0,  -3.1,  -1.6, 0,     0,   806
240.0,   2.5,   2.5, 150.0,  4.0,   0.0,  -1.2, 1,     0,  6062
240.0,   2.5,   2.5,  10.0,  4.0,   0.0,  -0.8, 0,     0,  2167
240.0,   9.8,   9.8, 150.0,  4.0,  -1.6,  -0.4, 0,     0,  1512
240.0,   9.8,   9.8,  10.0,  4.0,  -3.5,  -2.4, 0,     0,  1293
240.0,  20.5,  20.5, 150.0,  4.0,  -4.7,   1.6, 0,     0,  1512
240.0,  20.5,  20.5,  10.0,  4.0,  -1.6,  -0.8, 0,     0,  1293

#
#  Data file:    cd4db1.dat
#  Subject #:    5
#  Session #:    5
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:25 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  4.0,  -0.8,   0.0, 0,     0,  3476
 80.0,   2.5,   2.5,  10.0,  4.0,  -0.8,   0.0, 0,     0,  2116
 80.0,   9.8,   9.8, 150.0,  4.0,  -5.4,  -0.8, 0,     0,  1158
 80.0,   9.8,   9.8,  10.0,  4.0,   0.8,  -0.8, 0,     0,  1175
 80.0,  20.5,  20.5, 150.0,  4.0,  -0.8,  -0.8, 0,     0,  1243
 80.0,  20.5,  20.5,  10.0,  4.0,   0.8,  -2.4, 0,     0,  1243
160.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.0, 1,     0,  3174
160.0,   2.5,   2.5,  10.0,  4.0,   0.0,  -0.8, 0,     0,  5089
160.0,   9.8,   9.8, 150.0,  4.0,  -3.1,   0.0, 0,     0,  1511
160.0,   9.8,   9.8,  10.0,  4.0,  -0.8,   0.0, 1,     0,  3006
160.0,  20.5,  20.5, 150.0,  4.0,  -1.6,   6.3, 0,     0,   924
160.0,  20.5,  20.5,  10.0,  4.0,  -1.6,  -4.7, 0,     0,  1260
240.0,   2.5,   2.5, 150.0,  4.0,  -0.8,   0.0, 0,     0,  2015
240.0,   2.5,   2.5,  10.0,  4.0,   0.0,  -0.8, 1,     0,  9238
240.0,   9.8,   9.8, 150.0,  4.0,  -3.9,   1.6, 0,     0,  2049
240.0,   9.8,   9.8,  10.0,  4.0,  -4.7,   1.6, 0,     0,  1965
240.0,  20.5,  20.5, 150.0,  4.0,  -3.9,  11.8, 0,     0,  2099
240.0,  20.5,  20.5,  10.0,  4.0,   6.2,  -2.4, 0,     0,  1276

#
#  Data file:    cd4jl1.dat
#  Subject #:    2
#  Session #:    5
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    23:29 on Friday November 15, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
```

```
 80.0,   2.5,   2.5, 150.0,  4.0,   0.8,  -0.8, 0,     0,  1612
 80.0,   2.5,   2.5,  10.0,  4.0,  -0.8,   0.8, 1,     0,  5005
 80.0,   9.8,   9.8, 150.0,  4.0,   0.8,   0.8, 0,     0,  1259
 80.0,   9.8,   9.8,  10.0,  4.0,  -0.8,   0.8, 0,     0,  1041
 80.0,  20.5,  20.5, 150.0,  4.0,   0.8,   3.2, 0,     0,   668
 80.0,  20.5,  20.5,  10.0,  4.0,  -2.3,   1.6, 0,     0,   823
160.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.8, 0,     0,  2115
160.0,   2.5,   2.5,  10.0,  4.0,   0.0,   0.0, 0,     0,  1847
160.0,   9.8,   9.8, 150.0,  4.0,  -4.7,  -0.8, 0,     0,  1310
160.0,   9.8,   9.8,  10.0,  4.0,  -3.1,   0.0, 0,     0,  1075
160.0,  20.5,  20.5, 150.0,  4.0,   0.0,  -0.8, 0,     0,   923
160.0,  20.5,  20.5,  10.0,  4.0,  -6.2,   1.6, 0,     0,  1209
240.0,   2.5,   2.5, 150.0,  4.0,   0.8,   0.0, 0,     0,  2452
240.0,   2.5,   2.5,  10.0,  4.0,  -6.2,   0.8, 1,     0,  5676
240.0,   9.8,   9.8, 150.0,  4.0,   3.1,  -0.8, 0,     0,  1545
240.0,   9.8,   9.8,  10.0,  4.0,  -1.6,  -0.8, 0,     0,  1511
240.0,  20.5,  20.5, 150.0,  4.0,  -3.1,   0.4, 0,     0,   887
240.0,  20.5,  20.5,  10.0,  4.0,  -3.1,  -3.2, 0,     0,  1008

#
#  Data file:    cd4js1.dat
#  Subject #:    4
#  Session #:    5
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    14:17 on Monday November 18, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  4.0,   0.8,   0.8, 0,     0,  2468
 80.0,   2.5,   2.5,  10.0,  4.0,  -0.8,   0.0, 0,     0,  2250
 80.0,   9.8,   9.8, 150.0,  4.0,  -2.3,   0.8, 0,     0,  1259
 80.0,   9.8,   9.8,  10.0,  4.0,   0.8,  -1.6, 0,     0,   990
 80.0,  20.5,  20.5, 150.0,  4.0,  -7.0,  -1.6, 0,     0,   806
 80.0,  20.5,  20.5,  10.0,  4.0,  -7.0,  -0.8, 0,     0,   687
160.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.0, 1,     0,  4349
160.0,   2.5,   2.5,  10.0,  4.0,  -0.8,   0.0, 0,     0,  2687
160.0,   9.8,   9.8, 150.0,  4.0,   1.9,  -0.8, 0,     0,  1797
160.0,   9.8,   9.8,  10.0,  4.0,   0.0,   0.0, 0,     0,  1276
160.0,  20.5,  20.5, 150.0,  4.0,  -2.7,   0.0, 0,     0,   974
160.0,  20.5,  20.5,  10.0,  4.0,  -1.6,   3.9, 0,     0,   739
240.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.0, 1,     0,  3190
240.0,   2.5,   2.5,  10.0,  4.0,   0.0,   0.0, 0,     0,  2667
240.0,   9.8,   9.8, 150.0,  4.0,  -1.6,  -0.4, 0,     0,  1461
240.0,   9.8,   9.8,  10.0,  4.0,  -1.6,   1.6, 0,     0,  1175
240.0,  20.5,  20.5, 150.0,  4.0,   3.1,  -3.5, 0,     0,  1259
240.0,  20.5,  20.5,  10.0,  4.0,   1.6,   3.5, 0,     0,  1192

#
#  Data file:    cd4rv1.dat
#  Subject #:    3
#  Session #:    5
#  Subject Name:
#  Sitting #:    1
#  Date/Time:    00:39 on Sunday November 17, 1996
#
#   A,     W,     H,    th,  CDG,     x,     y, E, HomeT, MoveT
 80.0,   2.5,   2.5, 150.0,  4.0,  -0.8,  -0.8, 0,     0,  1965
 80.0,   2.5,   2.5,  10.0,  4.0,   0.4,   0.0, 1,     0,  6416
 80.0,   9.8,   9.8, 150.0,  4.0,  -2.3,   0.8, 0,     0,  1091
```

```
 80.0,   9.8,   9.8,  10.0,  4.0,  -0.8,  -1.6, 0,     0,  1512
 80.0,  20.5,  20.5, 150.0,  4.0,  -2.3,   0.8, 0,     0,   991
 80.0,  20.5,  20.5,  10.0,  4.0,   3.5,   3.2, 0,     0,  1293
160.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.8, 0,     0,  9104
160.0,   2.5,   2.5,  10.0,  4.0,   0.8,   0.0, 0,     0,  3141
160.0,   9.8,   9.8, 150.0,  4.0,   0.0,  -1.6, 0,     0,  1058
160.0,   9.8,   9.8,  10.0,  4.0,   3.1,   0.8, 0,     0,  1226
160.0,  20.5,  20.5, 150.0,  4.0,   6.2,  -0.8, 0,     0,   890
160.0,  20.5,  20.5,  10.0,  4.0,   7.0,   4.7, 0,     0,  1108
240.0,   2.5,   2.5, 150.0,  4.0,   0.0,   0.4, 1,     0,  6114
240.0,   2.5,   2.5,  10.0,  4.0,   0.0,   0.0, 0,     0,  1931
240.0,   9.8,   9.8, 150.0,  4.0,  -2.3,   0.8, 0,     0,  1007
240.0,   9.8,   9.8,  10.0,  4.0,   0.0,   3.2, 0,     0,  1478
240.0,  20.5,  20.5, 150.0,  4.0,  -0.8,  -3.9, 0,     0,   705
240.0,  20.5,  20.5,  10.0,  4.0,   1.6,  -0.8, 0,     0,  1527
```