The Well-Constructed Optimal Duration Paradigm of One-Dimensional Aimed Movement

# 1. Fitting expressions for Minitab corresponding to Table 1

Minitab 19 is employed. It is not case sensitive.

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| Paradigm number | Fitting expression |
| E\_0 | (x1+x2\*ln(a/w+1))\*\*2 |
| E\_1 | x1+x2\*ln(a/w+1) |
| E\_2 | x1+x2\*ln(a)-x3\*ln(w) |
| E\_3 | x1+x2\*ln(a/w+1)-x3\*a\* ln(a/w+1) |
| E\_4 | x1+x2\*a+x3\*(1/w-1) |
| E\_5 | x1\*a\*\*x2\*w\*\*x3 |
| E\_6 | x1+x2\*sqrt(a/w) |
| E\_7 | x1+x2\*sqrt(a) |
| E\_8 | x1+x2\*a+x3\*(1/w)+ x4\*w |
| E\_9 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5/(w\*w) |
| E\_10 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5/(w\*w)+x6\*(w\*w) |
| E\_11 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5/(w\*w)+x6\*sqrt(a/w) |
| E\_12 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5/(w\*w)+x6\*sqrt(a/w)+x7\*ln(a/w+1) |
| E\_13 | x1+x2\*a+x3\*(1/w)+x4\*w+x5/(w\*w)+x6\*sqrt(a/w)+x7\*sqrt(1/w)+x8\*ln(a/w+1) |
| E\_14 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5/(w\*w)+x6\*sqrt(a/w)+x7\*sqrt(a)+x8\*ln(a/w+1) |
| E\_15 | x1+x2\*a+x3\*(1/w)+x4\*w+x5/(w\*w)+x6\*sqrt(a/w)+x7\*sqrt(1/w)+x8\*ln(a/w+1)+x9\*sqrt(a) |
| E\_16 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5\*sqrt(a/w)+x6\*sqrt(1/w)+x7\*ln(a/w+1)+x8\*sqrt(a) |
| E\_17 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5\*sqrt(a/w)+x6\*sqrt(1/w)+x7\*ln(a/w+1)+x8\*sqrt(a)+x9\*sin(x10\*a/w) |
| E\_18 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5\*sqrt(a/w)+x6\*sqrt(1/w) +x7\*ln(a/w+1)+x8\*sqrt(a)+x9\*(a/w) |
| E\_19 | x1+x2\*a+x3\*(1/w)+x4\*sqrt(a/w)+x5\*sqrt(1/w)+x6\*ln(a/w+1)+x7\*sqrt(a)+x8/a |
| E\_20 | x1+x2\*a+x3\*(1/w)+x4\*sqrt(a/w)+x5\*sqrt(1/w)+x6\*ln(a/w+1)+x7\*sqrt(a) |
| E\_21 | x1+x2\*a+x3\*(1/w)+ x4\*w+x5\*sqrt(a/w)+x6\*sqrt(1/w)+x7\*ln(a/w+1)+x8\*sqrt(a) +x9/a |

# 2. Data sets

The first and second data sets are acquired by the program of Fig. 3. The data in the two data sets have their own fluctuations. They do not show strict rules as the historical data set.

There are five sheets in the Excel file. The **first sheet** shows the first dataset when A=A1+A2. The **second sheet** shows the first dataset when A=A1+A2+W/2. The **third sheet** shows the second dataset. The **fourth sheet** shows the historical dataset from one experiment of Fitts (1954). The **fifth sheet** shows the value differences between the fitted E\_16 and E\_1, and also values of the E\_16 and E\_1.

In the second dataset, there are a special situation when two rows have the same *W* and *A* values. This is because there are two separate and independent experimental groups with the same *W* and *A* values.

# 3. Additional remarks to the study

Table 3 uses the datasets in the **first sheet** and the **fourth sheet** as DS1 and DS2 respectively.

Fig. 6 uses the dataset in the first sheet. The fitted E\_1 for Fig. 6 is:

u = 529.84 + 258.109 \* ln(A / W + 1).

The fitted E\_16 for Fig. 6 is:

u = 906.826 + 0.769 \* A + 7260.06 \* 1 / W + (- 0.461 \* W) + 18.426 \* sqrt(A / W) + (-2778.68 \* sqrt(1 / W)) + (218.251 \* ln(A / W + 1)) + (- 25.811 \* sqrt(A))