Steady Hand Project

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1 Introduction

In this project each person in PHYS213 recorded how steady they could hold their hands using a motion capture device and a green laser. Data was collected from two distances then analyzed using a series of linux commands and programs.

2 Equipment

- MotionLogger
- Green Laser
- Linux desktop environment

3 Procedure

First a series of data was collected using the MotionLogger device and a green laser. Each student took their turn at a short distance then a long distance. The first step was to get into position at the set point. For the short distance, this was behind the second set of tables in the classroom. For the second set the student was standing behind the last set of desks. After getting into position, the student would aim the laser in the specified area on the whiteboard which had previously been drawn. After doing this they would turn on the laser and try to keep it as steady as possible for just over 10 seconds. After recording the data, Dr. Clark distributed the data via the class website to all the students to analyze using various linux programs.

4 Results

The results show that the standard deviation ranged significantly for the group. The quantatative results of the experiment can be seen in tables 1, 2, 3, and 4. Further information about the distribution of points can be seen in the histogram in figure 1.

5 Tables and Figures

Filename	AverageX	AverageY	stddevX	stddevY	TotalDev
data-201745135431.txt	497.375	577.75	3.29535658162	12.0778723292	12.51936000762
data-20174513521.txt	495.666666667	587.333333333	7.93025150225	10.4376455412	13.10852140146
data-201745135328.txt	491.375	572.4375	4.3928208477	12.3779983741	13.1343716541
data-201745135111.txt	498.1875	589.8125	10.0869268734	13.0334605439	16.4808127074
data-201745135246.txt	492.25	563.0	14.0934381895	27.8758407945	31.2359968626

Table 1: A table of the results from the short distance experiment for the first second

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Filename	AverageX	AverageY	stddevX	stddevY	TotalDev
data-201745135944.txt	506.125	574.1875	5.17656981021	12.7351322628	13.74701672185
data-20174513577.txt	472.666666667	579.5	15.3188337241	25.7811300502	29.9888868304
data-201745135616.txt	474.8125	589.375	12.3286695856	28.6626390097	31.2016500966
data-201745135851.txt	491.625	596.9375	23.3475774975	30.1635515772	38.1437965959
data-20174513581.txt	524.9375	598.5625	21.5789792101	32.3606990615	38.8955934200

Table 2: A table of the results from the long distance experiment for the first second

Filename	AverageX	AverageY	stddevX	stddevY	TotalDev
data-201745135431.txt	499.927631579	572.401315789	6.87802753787	12.5365307614	12.51936000762
data-20174513521.txt	492.327160494	577.561728395	8.04469017958	18.409502162	13.10852140146
data-201745135328.txt	479.344155844	580.733766234	25.5599955974	32.8824731682	13.1343716541
data-201745135111.txt	493.39375	576.40625	8.61455663035	15.6151156236	16.4808127074
data-201745135246.txt	485.550632911	574.772151899	14.8989412029	23.4139682247	31.2359968626

Table 3: A table of the results from the short distance experiment for the first ten seconds

Filename	AverageX	AverageY	stddevX	stddevY	TotalDev
data-201745135944.txt	502.820512821	541.25	9.91760102008	21.9667216255	13.74701672185
data-20174513577.txt	489.301282051	586.121794872	17.2863032603	27.9291899845	29.9888868304
data-201745135616.txt	487.681818182	590.5	19.0295240693	34.7532115679	31.2016500966
data-201745135851.txt	494.953947368	586.526315789	20.66082258	27.8980633568	38.1437965959
data-20174513581.txt	475.126582278	593.981012658	41.6203051372	55.0810359884	38.8955934200

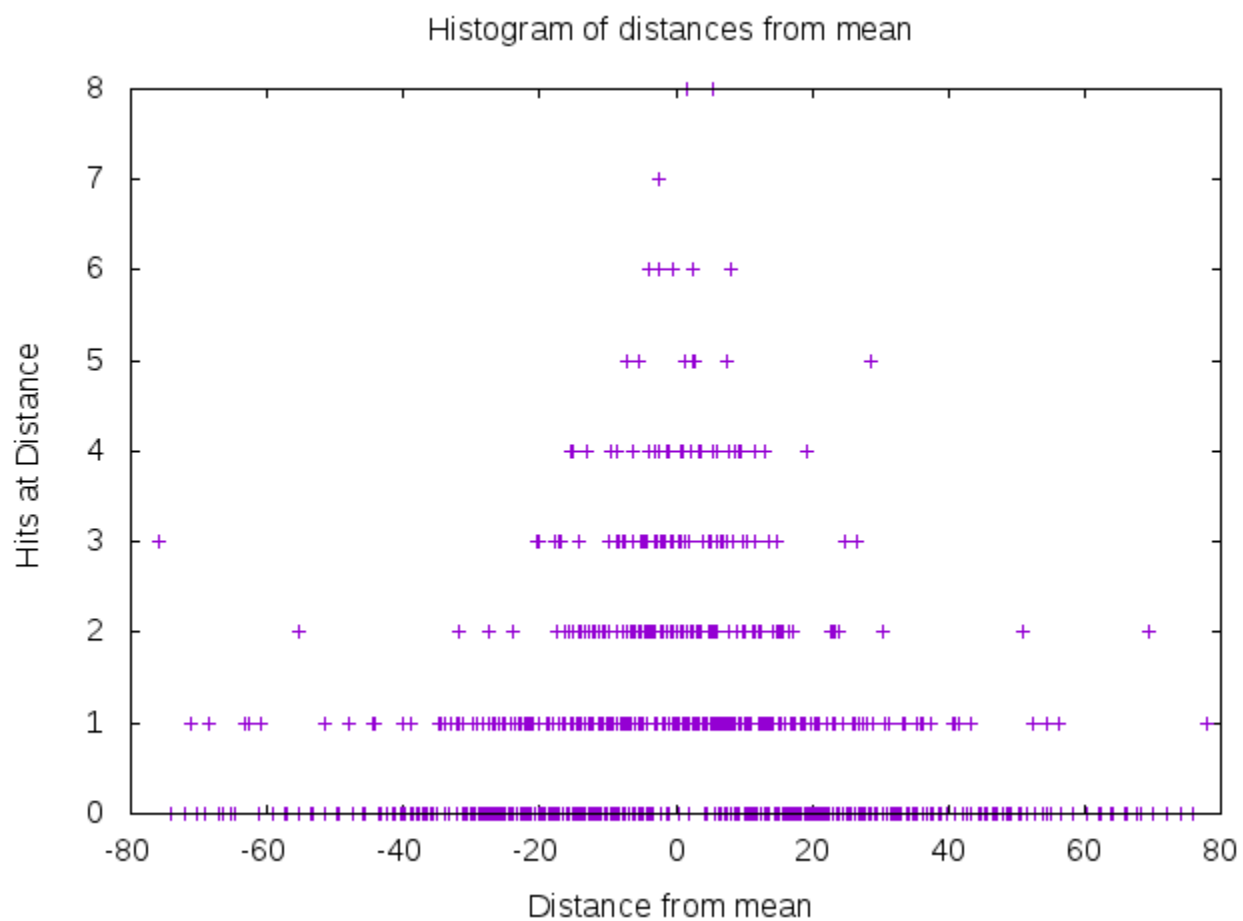Table 4: A table of the results from the long distance experiment for the ten seconds

Figure 1: Graph of the distances of all points within ten seconds from the mean