Best Linear (unbiased) Estimator

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1 Motivation

When dealing with samples garnered through (aqcuired by) any thinkable method one has to expect to that the incoming signal does not perfectly match our expectation. Say you have a 1 to 1 relationship, as you'd see in any function of some real value x, that we'll let be $f(x) = x$ (see here: Plot of $f(x) = x$) for now (for simplicities sake, as we're only concerned with the concept and not with any particular function, which might overcomplicate this issue as of this instance). Now let's add some random samples. . . .

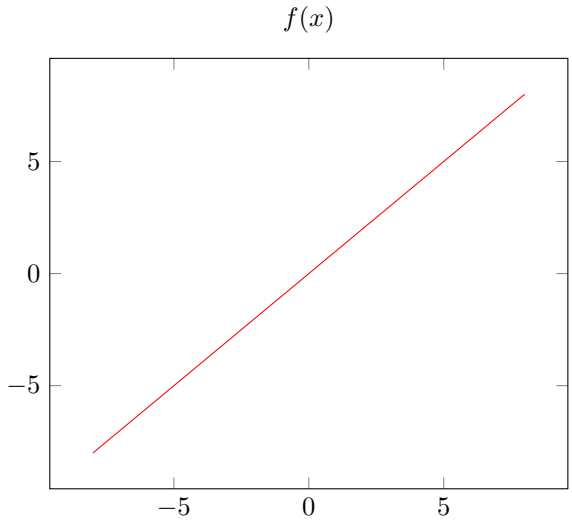

Figure 1: Plot of $f(x) = x$

Have to rewrite this: 1: Which could include, e.g., video-footage of a QR-Code, user-behaviour trackers of various kinds (like GPS, website accesses (not necessarily noticable even in https), or more generally: human-software interaction (ai, web, . . . any application could track *something*)), noisy signals in general (aqcuired over fading channels (where some information is ultimately lost, due to nature[1])).

2 Some Use-Cases

2.1 1-dimensional

2.2 2-dimensional

2.3 The path to the $n-$th dimension

This is mathematically possible, but can be (1) difficult to describe to another person (2) difficult to display or (3) might not be needed.

1.

2. Imagine the following scenario: You have to build a $3-$dimensional model for 4 seperate functions of x displaying all 4 functions at the very same time.

3. Raises the question: Why are *you* interested in estimating 3 or more functions of x at the same time? (And also why would you try and to so per hand? This can and should be done using a computer, for time efficiencies sake).

References

[1] firstname lastname. *havetofind*. 0. ISBN 0. doi: havetofind.