

POSTSCRIPT regarding the Bass theory of Communication Theology

I can illustrate my concept of Communication Theology better using something that I learned from my former protégé Rudolf Kalman, whom I successfully nominated for the Draper Award of the National Academy of Engineering (NAE) in 2008, which led to his receiving the National Medal of Science from President Obama in 2009, as depicted in the photos [labeled “Articles”] 22-24 on my Engineering Sub-Site <http://www.innoventek.com/engineering.html> , and who had showed me how to optimally minimize the effects of both Transmission Disturbances and Reception Noises in the communication of Information.

The NAE has referred to Kalman Filtering as an epochal discovery which is “the chief enabling technology of the aerospace age,” because it enabled the first successful manned lunar landing and is vital to the success of Guidance, Navigation, and Control (GNC) systems in modern vehicles and is a mission-critical key to the success of the now-ubiquitous GPS.

Once when I was fumbling around attempting to apply Kalman Filtering to a problem related to economic time-series, Rudy Kalman sent me an email which clarified the meaning of Error Minimization in terms of “Gaussian Least Squares” or the shortest distance between two points in an N-dimensional Euclidean space, as defined in Vector-Matrix Algebra. (Those who know the rudiments of this subject may like my one-page summary: “Linear Least Squares In A Nutshell,” available online at http://www.innoventek.com/BassLinearLeastSquaresInA_%20Nutshell.pdf.)

This following Figure (for which I am indebted to Vikki Bouquillon) is an attempt to depict in 3-dimensional space something which is actually defined mathematically in an N-dimensional Euclidean space, where $N \gg 3$, but is analogous to something which we can understand visually.

The received message signal is a column of N real numbers, or a **vector** in Message Space. The received message has been corrupted in two different ways. There is Transmission Disturbance between the origination of the signal and its reception, and there is also Reception Noise at the point of reception of the signal.

Kalman Filtering enables the minimization of both kinds of corruption provided that we have an adequate *a priori* dynamical model of the transmission process.

In the Figure on the next page, one linear subspace is labeled Allowed-Message Space, and the actual signal, or **True Message**, is a point depicted by a radius-vector from the origin to the corresponding point in Allowed-Message Space.

Orthogonal [perpendicular] to Allowed-Message Space is the **Reception-Noise Space**, shown as a one-dimensional axis in a perspective-plane somewhat **horizontal** to the viewer.

Also orthogonal to Allowed-Message Space is the **Transmission-Disturbance Space**, depicted as a one-dimensional **vertical** axis.

If the viewer mentally draws a small sphere around the tip of the **Received Message** radius-vector, and lets the size of the sphere grow until it first touches the Allowed-Message Space, then the “distance” in N-dimensional Message Space between the Received Message and the True Message has been minimized.

But that is mathematically identical to removing from the Received Message radius-vector its vector-components which are orthogonal to **both** the Transmission-Disturbance Space **and** the Reception-Noise Space!

In my attempt to explain to Philosopher/Mathematician/Theologian Dembski my concept of Communication Theology, I was attempting to make an analogy between the axes in the following picture and the identification of the Transmission-Disturbance axis with “**Satanic Jamming**” and identification of the Reception-Noise axis with “**Human Cultural Predilections**.”

