According to Wikipedia, if , then

Assume that:

To avoid having to retain every single and , ideally we would summarize this information for each path. This is only needed if we have many observations i within each path. Depending on the time steps of the GPS tracking device, we don’t need the approximation below.

Let’s perform a second-order Taylor series expansion around and for

Here are the derivatives:

Because of this, the final expression that we end up with is given by:

Notice that . Therefore: