Optimization for Road Data

Least Squares Optimization

With

Where

Road Curvature Model

Road Sampled Curvature Data (GPS Data and Google Earth Data)

Linear Models to be investigated:



Piecewise-Linear Model to be investigated:

Where

Unit Step Function

Note: The model is technically a “linear spline” that is restricted to always follow a linear behavior, followed by a constant behavior and a decreasing linear ending part. Also, this model would constitute the Ideal Model as per AAHSTO Regulations.

Constraints to be investigated (for both Linear and Non-linear Models)

* Unconstrained Cases
* Ackerman Angle Constraint

Where L = Vehicle Length

Speed Velocity

Understeer Gradient

Curvature Model

Note: The Ackerman Angle is stable for understeer behavior at different speeds when degrees.

Least Squares Optimization

With

Where

* Road Curvature Model k
* Road Sampled Curvature Data (GPS Data and Google Earth Data)

Linear Models to be investigated:

* Ideal Model as per AAHSTO Regulations
* Testing Model

Piecewise-Linear Model to be investigated: