Appendix I: THE EXPONENTIAL PREDICTION MODEL

We use an exponentially decreasing acceleration model to predict the vehicle kinematics:

with boundary conditions:

,

,

And integrands:

,

,

solving the boundary condition problem yields:

,

where

,

,

,

,

Appendix II: HOW TO CONVERT QUINTIC POLYNOMIAL GENERATION PROBLEM INTO A QP PROBLEM

The standard form of a quintic polynomial is:

The objective function can also be written as:

Expanding the first term yields:

Expanding the second term yields:

H is denoted by:

The equality constraints are:

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S