

A Parametric Sensitivity Based Arrival Cost State Estimator

Jonas Fraihat*, Ingrid Lie Brørs**, Johannes Jäschke***

* Norwegian University of Science and Technology, Trondheim, 7491
Norway (jonas.d.fraihat@ntnu.no)

** Norwegian University of Science and Technology, Trondheim, 7491
Norway (ingrilbr@stud.ntnu.no)

*** Norwegian University of Science and Technology, Trondheim, 7491
Norway (johannes.jaschke@ntnu.no)

Abstract: Recently, a Parametric Sensitivity (PS) based method for approximating the Arrival Cost (AC) in a Moving Horizon Estimation (MHE) problem has emerged. This method solves a MHE problem for the AC, and parameterizes the solution with the PS. When this horizon is set to one, this parameterization can be found explicitly. By combining this special case with a MHE, with a horizon of zero, and assuming a linear measurement function, we can derive a PS based AC State Estimator. We will present this method and compare it with the Extended Kalman Filter.

Keywords: Nonlinear observers and filters, Estimation and filtering, Kalman filtering, Linear systems, Complex dynamic systems, and Process modeling, identification, and estimation techniques.
