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Paper Analysis Outline 2

Julier et al. (TAC 2000)

- **What problem is the paper addressing?**
    - This paper addresses the shortcomings of a Kalman filter when applied to nonlinear systems
- **What is the proposed solution?**
    - Using samples to parameterize the mean and covariance of a probability distribution (does not need to be Gaussian). It can be used on linear and non linear systems.
- **What are the assumptions the solution depends on (both explicit and implicit)?**
    - Assumes that higher order Taylor Series terms are negligible (could introduce error or bias)
    - They assume the noise vectors have zero mean (no bias)
    - They assume a lot of Gaussian distributions in data and samples.
- **What is novel about the paper?**
    - This paper provides a new method for using a Kalman filter on non linear systems that is more accurate and easier to implement than an EKF of Gauss second order filter.
- **What are the claims the paper makes?**
    - They claim their method is easier to implement and more accurate than previous methods.
- **Does the evaluation included in the paper validate/verify the claims?**
    - They apply their method to a body reentering the atmosphere. Their method does have significantly reduced error, but in the first 10-20 timesteps they do have more error than the EKF.