# Differentiable Bayesian Filters

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Recently, differentiable filters have been proposed as a data-driven expansion to classical Bayesian filters [1]. Since such classical filters rely on analytical models, this is especially useful when the transition or measurement models of the filtered process are not known exactly. The approach has demonstrated impressive performance: on various state estimation tasks, it has been shown to outperform unstructured LSTMs [2].

We want to use differentiable filters for state estimation in either the simulated example disc tracking task from [1] and [2] or for estimating poses based on multiple sensor modalities in pushing scenarios in the MIT Push dataset [3] similar to [4]. Since we are currently unsure about the way to approach of both tasks, our decision will depend on further research and the feedback from the assigned tutor. Therefore, we propose to implement one type of differentiable filter in a first step and then run one of the experiments mentioned above with some modifications.

Additionally, we want to compare our filter to a recurrent neural network and show advantages and disadvantages based on our results.

## References

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