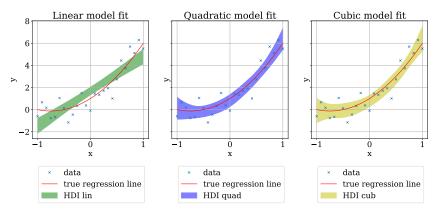
Bayesian model selection

Seminar physics 760 – Computational Physics



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Introduction



Naturally, we are again all about that BAYES

Bayes' Theorem

$$\operatorname{prob}(\boldsymbol{\theta}|y) = p(\boldsymbol{\theta}|y) = \frac{p(y|\boldsymbol{\theta}) \cdot p(\boldsymbol{\theta})}{p(y)}$$

with

- ightharpoonup posterior $p(\theta|y)$
- ightharpoonup likelihood $p(y|\theta)$
- $ightharpoonup prior p(\theta)$
- ► marginal likelihood $p(y) = \int_{-\infty}^{+\infty} d\theta p(y|\theta) p(\theta)$

This can be used for model selection (?)

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SEQUENTIAL MONTE CARLO SAVAGE-DICKEY-Density-Ratio (SDDR) Error analysis and diagnostics

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Parameter estimation



JAN and Marius already talked about this, so here we only sketch the basics again

Model comparison



How do we turn BAYES' theorem into a tool for model comparison?



Parameter estimation Model comparison

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Sequential Monte-Carlo (SMC)



SAVAGE-DICKEY-Density-Ratio (SDDR)



Error analysis and diagnostics



Inhalt...



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Choosing priors and likelihoods



Computing Bayes-factor





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Summary



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