

Scribe: Michael Haberl

Part I: Introduction talk by Andrew Nelson (AN)

Max Skoda: Are Evidence probabilities normalized?

AN: Evidence Normalizes the Probability Term

Nested smaping is more efficient to estimate the evidence by multidim integration

Athur Glavic: Can nested sampling corefine datasets, can it sample the posterior?

AN: MCMC is easier to use to explore parameter posterior prob, but nested is more reliable for model comparison via evidence

Part II: Andrew Caruana (AC) – Practical Uses of Nested Sampling

Michael Haberl: Can we use this with unweighted fitting or are reliable errorbars essential?

AC: Need suitable Error Bars. Those can be difficult to determine for magnetism NR

AN: Systematic errors outgrow in x-rays much more quickly

Athur Glavic: Combined measurements – high-q (noisier, but more info) vs low q data

AC: Co-Fit possible, but challenging for lab data. Better use labdata results as informed prior.

Daniel Kerr: Is nested Sampling superior for multi-modality? What is difference in point selection compared to MCMC?

AN: MCMC Series of walkers, steps generated from pairs of walkers, makes it less likely to explore some other regions. PT allows for exploration walkers. Nested Sampling samples from entire prior

AC: Live points do not immediately go to maximum, but explores contour fist, iteratively climbs into minimum. Uses Likelihood contous instead of walker chains. Can use different kind of steppers. DREAM does a similar thing with Latin Hypercube sampling

Josh Cooper:

- Point: Model evidence – integral of evidence is not constrained by prior, therefore impossible to calculate. Absolute evidence probability numbers make no sense, only in comparison
- Question: Speed – Efficiency of sampling, is nested faster, because no thinning necessary?

AN: Independent samples per second – dynesty gives higher numbers compared to pymc or emcee. Would not recommend it as a default, though. Nested sampling does not have a set run time to finish

AN: Where/when would participants use Nested sampling?

JC: used nested sampling with refnx, copied sample scripts (very useful instructions)

AN: Agrees, more in-depth instructions would be useful. Nested sampling packages provide Log-Likelihoods and functions for prior volumes (non-uniform)

Tom Arnold: Missing in the package examplesis is a basic introduction like given in talk. Otherwise difficult to choose a method -> high entry barrier.

AC: Methods should not be a blackbox. Users should get a grasp on basic concepts and the pitfalls

AN: It is challenging to show people how to use tools the right way (sample long, burn samples...)

Christy Kinane: Good to have sampling included in packages, because users are more likely to consider using them.

General remark (context?) by AN: It is good to have PhDs just trying out stuff sometimes

Tom Arnold: Will explanations in the talk be added to refnx documentation?

Max Skoda: A little more info about what and why we are doing things would help. Explanations of differences in nomenclature between sampling packages to reduce confusion would be nice.

Arwel Hughes(?) ran into “how many layers” problem with roundrobin sample, could successfully decide on a reasonable number with sampling (1 layer)

Josh Cooper: It would be good to have a place with different examples how and why sampling was used for a reflectometry problem