

Sampling High Dimensional Parameter Spaces

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DarkMachines Kickoff meeting, 19th June 2018

What is the idea and goal of the challenge

- We will systematically compare methods for sampling high dimensional parameter spaces
- The main goal is to survey techniques that are rarely used in current physics applications, and assess their use in physics problems through comparison with familiar techniques (e.g. MCMC, nested sampling, differential evolution)
- Will test the algorithms on toy functions (very quick), and realistic physics likelihoods (need to find a quick example)
- Will test both sampling posterior functions, and performing profile likelihood analyses

Is data available? Could data be generated?

- Data isn't an issue for us
- Rather, we need to identify which functions we want to test on
- A possible exception is the realistic physics likelihood (might want example code of real data for that, but that will not be hard to find)

When does the challenge/project start?

- We can start any time from now (though probably after the effort on the white paper has ceased)

How can I participate/who do I need to contact?

- Interested parties should email:

Martin White: martin.white@adelaide.edu.au

Joaquin Vanschoren: joaquin.vanschoren@gmail.com

Are we working via a slack page? Do we have video meetings?

- We will organise a kick-off video meeting based on expressed interest
- This meeting will include discussion of a possible Slack page
- We will use the meeting to outline typical particle physics use cases, so that machine learning experts can get a handle on the problem (and physicists can start using the right language...)
- From there, we need to identify a shopping list of algorithms, and define the toy examples that we will study first