

BAT-2 Status

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Recent progress

- Named priors (finally)
- Substantial cleanup of BAT code, some breaking changes
- Adapted to upcoming Julia v1.3 partr scheduler
- Distributed and multi-threaded code execution with BAT.jl and MPI.jl (Vasyl)
- Parameter space segmentation via AMI (Vasyl)

Open tasks (near term)

- Implementing comfortable priors: Named priors work, but still room for improvements
- Multi-Proposal MH (Lolian): Still under investigation, practical usefulness still unclear
- HMC: New package `DynamicHMC.jl` is supposed to be very good. Need to find someone to integrate it into `BAT.jl`
- Unit tests: Need fresh manpower on this
- Models for frequent use cases

Named priors

```
In [12]: prior = NamedPrior(  
          a = 5,  
          b = Normal(),  
          c = -4..5,  
          d = MvNormal([1.2 0.5; 0.5 2.1])  
        );  
  
cov(prior)
```

```
Out[12]: 4×4 Array{Float64,2}:  
 1.0  0.0  0.0  0.0  
 0.0  6.75 0.0  0.0  
 0.0  0.0  1.2  0.5  
 0.0  0.0  0.5  2.1
```

```
In [13]: params = rand(prior)
```

```
Out[13]: 4-element Array{Float64,1}:  
  -0.33745087340552526  
  -0.9469971472047991  
   0.27447354828737996  
  -2.334758409121436
```

```
In [14]: params in param_bounds(prior)
```

```
Out[14]: true
```

```
In [ ]: logpdf(prior, params)
```

```
In [17]: VarShapes(prior)(params)
```

```
Out[17]: (a = 5, b = -0.33745087340552526, c = -0.9469971472047991, d = [0.274473548287  
37996, -2.334758409121436])
```

What's new with Julia

- Lot's of exciting news and development at JuliaCon 2019
- Julia v1.2 is almost done (v1.2-rc2 running just fine)
- Julia v1.3-alpha released: New partr scheduler, state of the art, fundamentally changes what's is possible with multitasking
- Julia code execution on GPUs almost routine new, Julia even runs on Google TPUs now (experimental).