



Mathematical Biology Seminar

Monday, November 14, 2022

3 pm MDT (Virtual)

Join Zoom Meeting

<https://ualberta-ca.zoom.us/j/98497695684?pwd=SG5pcUVR50xucW5xd0xBTm1VVc4EUT09>

Meeting ID: 984 9769 5684

Passcode: 32123



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Scalable Bayesian Inference with Hamiltonian Monte Carlo

Despite the promise of big data, inferences are often limited not by sample size but rather by systematic effects. Only by carefully modeling these effects can we take full advantage of the data -- big data must be complemented with big models and the algorithms that can fit them.

One such algorithm is Hamiltonian Monte Carlo, which exploits the inherent geometry of the posterior distribution to admit full Bayesian inference that scales to the complex models of practical interest. In this talk I will present a conceptual discussion of the challenges inherent to Bayesian computation and the foundations of why Hamiltonian Monte Carlo is uniquely suited to surmount them.

Bio: Michael Betancourt is the principal research scientist at Symplectomorphic, LLC where he develops theoretical and methodological tools to support practical Bayesian inference. He is also a core developer of Stan, where he implements and tests these tools. In addition to hosting courses on Bayesian modeling and inference with Stan he also collaborates and consults on analyses in epidemiology, pharmacology, engineering, marketing, and physics, amongst others. Before moving into statistics Michael earned a B.S. from the California Institute of Technology and a Ph.D. from the Massachusetts Institute of Technology, both in physics.

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