



Robust Bayesian Inference for Distributed Sensor Networks

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Deploy drone fleet to inspect hazardous area before sending first responders



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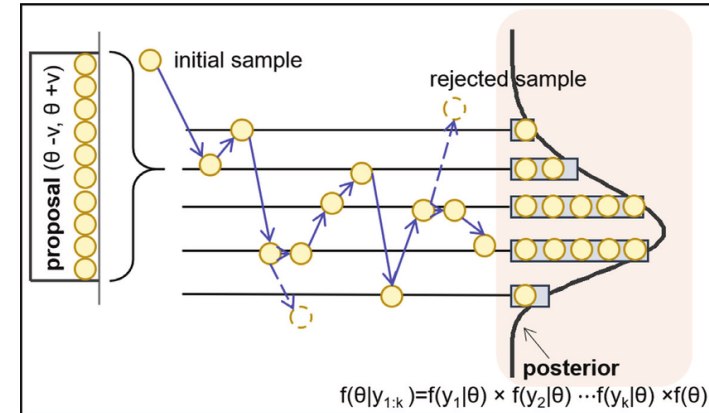
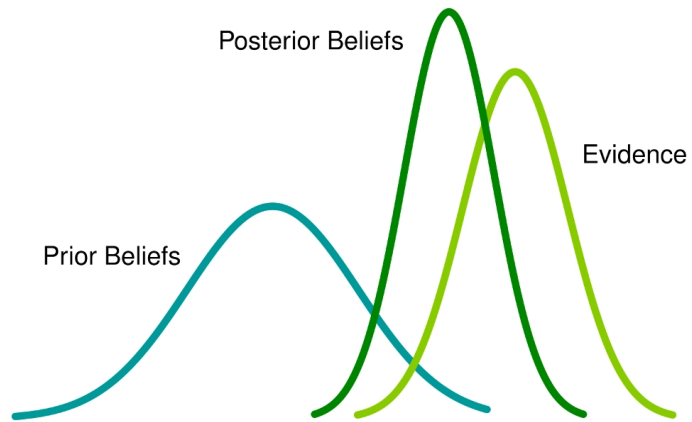
Aug 12, 2015, Tianjin Port Explosion



Drones need to collaborate and exchange information without a human directing actions



Bayesian inference methods enable collaborative learning



- Hamiltonian Monte Carlo (HMC)
- Metropolis-adjusted Langevin algorithm(MALA)
- Stochastic gradient Langevin dynamics(SGLD)
- Distributed Langevin Dynamics(DLD)
-

Drawback: manual tuning and parameter calibration



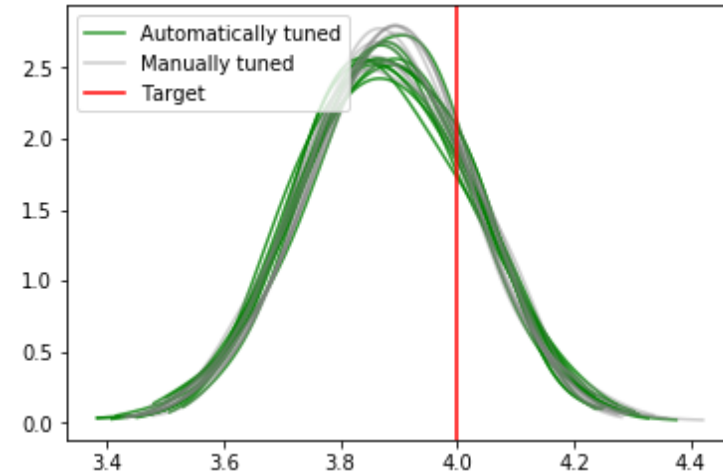
Our work: automating parameter calibration



Subsampling MH
Dual averaging optimization



Distributed Langevin Dynamics



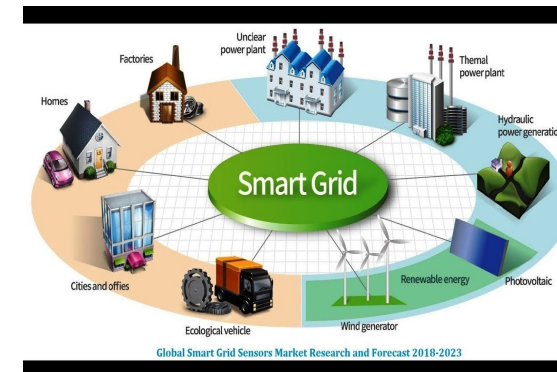
Self-driving cars



Drones



Smart grid sensor





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