Raw notes on Ising Computation

Gustaf Lundborg

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1 2021-06-03

- How to create Ising circuits?
- What are the scales we are working on?
- Connect several using systems as Ising spins
- E.g. ising chains that are separate, but can be connected at different times. There are many ways of creating dynamics
- What can a small Ising system calculate? Interesting to see it as a representation of a binary number. But only next door neighbor interactions of bits are not that interesting. Should probably have full connectivity. E.g. four spins without self connectivity.
- Would it be possible to make a random number generator from an Ising circuit? IE. from a critical state (needs investigating).
- If you randomize an Ising chain it should be possible to get a random sequence of up and down, which is perfect for Brownian motion.
- Could you get this through critical stat? Is critical state needed. Or can I just do a simulation to a "ground state"?
- will there be a critical state in a fully connected Ising chain?

2 2021-06-06

- Test by hand with a 4-by-4 J-matrix. What combinations will yield smallest energy...

3 2021-06-09

- Would it be possible to get any randomized statistics or perhaps make Monte Carlo simulations using an Ising model?
- Consider a random ising-system. If all spins are summed then the mean magnetization $\bar{m}$ is received. If sufficiently many simulations are made the density distribution function of $\bar{m}$ is received. What's the role of J here?