Thermodynamics of Information

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Session 1

1. A bit of history: Maxwell's demon, Szilard's engine, Bennett's solution.
2. Basic concepts: Shannon information, mutual information, relative entropy.
3. Heat, work, and non-equilibrium free energy.
4. Information and the second law.

Session 2

5. Fluctuation theorems for feedback systems.
6. Reversibility: optimal Maxwell demons, optimal feedback.
7. Thermodynamic cost of measurement and erasure.

Session 3

8. Creating information: symmetry breaking.
9. Maxwell demons in the phase space and microcanonical Szilard engines.
10. Information flows.

References

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