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A MATLAB GUI to study Ising model phase transition CUR-
TISLEE THORNTON, TRINANJAN DATTA, Georgia Regents University — We
have created a MATLAB based graphical user interface (GUI) that simulates the
single spin flip Metropolis Monte Carlo algorithm. The GUI has the capability to
study temperature and external magnetic field dependence of magnetization, sus-
ceptibility, and equilibration behavior of the nearest-neighbor square lattice Ising
model. Since the Ising model is a canonical system to study phase transition, the
GUI can be used both for teaching and research purposes. The presence of a Monte
Carlo code in a GUI format allows easy visualization of the simulation in real time
and provides an attractive way to teach the concept of thermal phase transition and
critical phenomena. We will also discuss the GUI implementation to study phase
transition in a classical spin ice model on the pyrochlore lattice.

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