Report for SIR model simulation

In my research, an animation which visualize how the disease is spread among society according to the given SIR model, is studied.

In the programming part of this research, the code is mainly divided into three parts, the numerical integration part according to the SIR model, which responsible for getting the number of infections, of recovers, and of susceptible; the particle collision part, which responsible for simulating the elastic collision between particles, and outputting its animation; the pandemic spread animation part, which responsible for visualize how the disease spread among people.
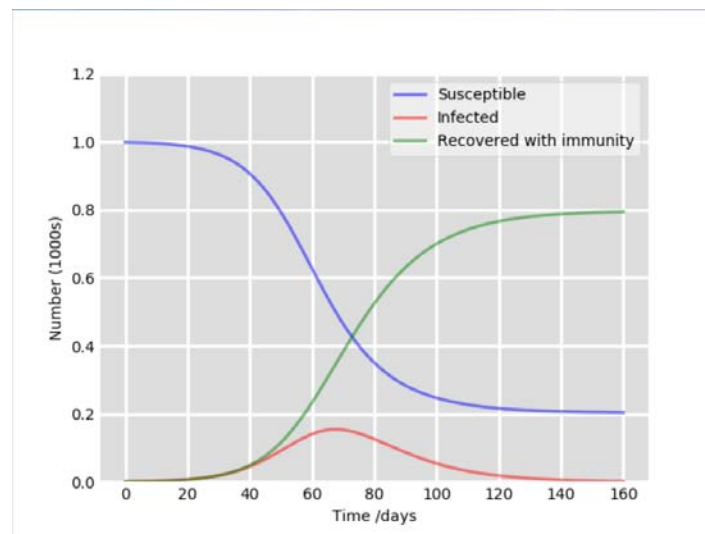

Fig. 1.   The pandemic revolution curve(contact rate:0.2, recovery rate:0.8)
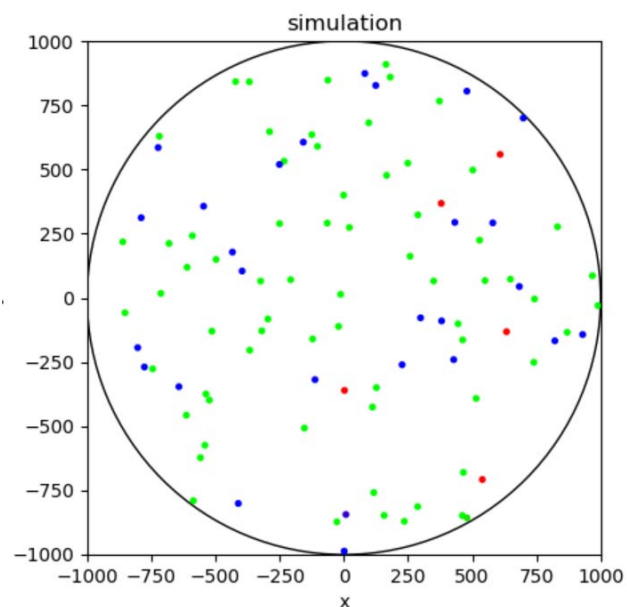

Fig. 2.   The visualized pandemic revolution graph near the end of spreading

From the research, it is clear that after the time the number of infections reaches the peak, the speed of recovering will overwhelm the speed of infection, and the disease will be eliminated at the end. Meanwhile, if contact rate increases and recovery rate decreases, the disease will continue spreading for a longer period.
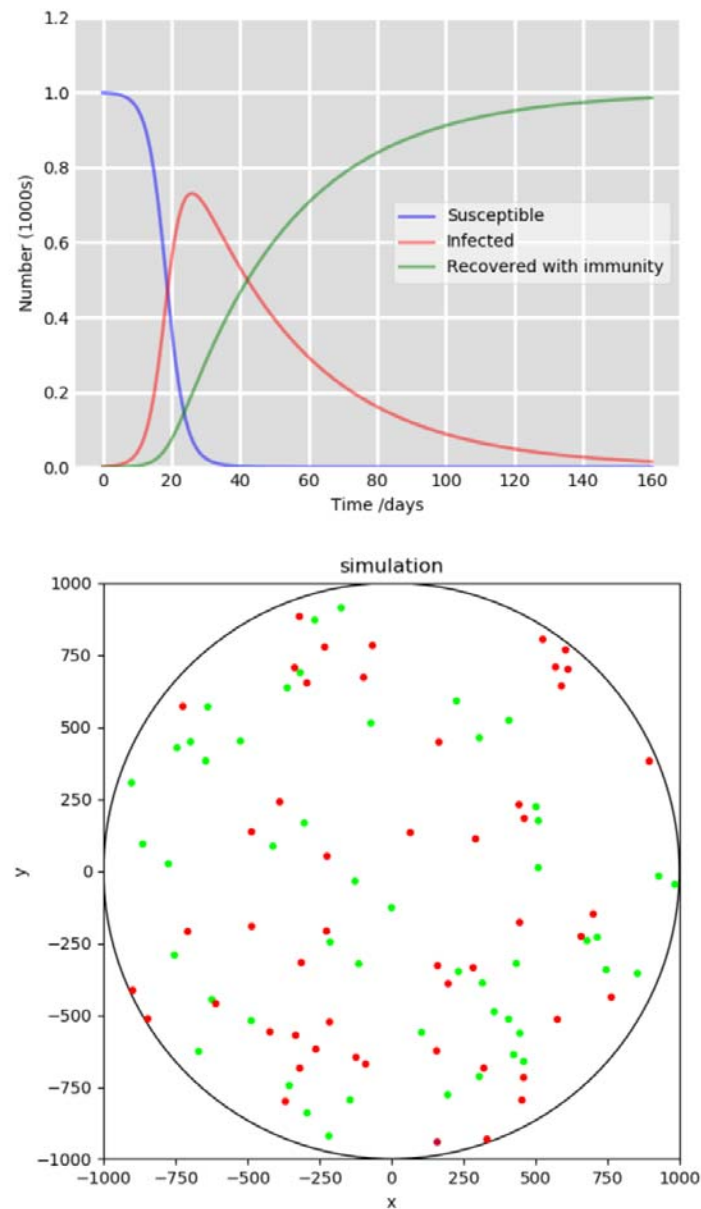

Fig. 3. Pandemic spreading with higher contact rate but lower recovering rate

However, the simulation is only the most brief situation, it do not consider the way how virus spread, the possibility that people been repeatedly infected, the interference of medical system or governmental regulations, and so on, but it could still reveals that isolation and effective medical treatment are good ways to terminate the pandemic.