Read me

We uploaded three C++ codes and two MATLAB codes. CCmodel.cpp is used for Gillespie simulation of multiple kinesins and dyneins; CCmodel\_ 1v1.cpp is used for Gillespie simulation of single kinesin and single dynein; TOW\_model.cpp is used to simulate the TOW model. The analytical\_approximation.m corresponds to Chapter 3 of SI; The mean\_field\_approximation.m corresponds to Chapter 4 of SI.

If you need to get the data of Fig.2, you should run the CCmodel.cpp and set these parameters: Average\_runlength\_velocity=1, Restart\_from\_the\_origin=0.

If you need to get the data of Fig.3A,B, you should run the CCmodel.cpp and set these parameters: Cooperative=1, Restart\_from\_the\_origin=1.

If you need to get the data of Fig.3C, you should run the CCmodel.cpp and set these parameters: Balance\_probability=1, Restart\_from\_the\_origin=1.

If you need to get the data of Fig.3D, you should run the CCmodel.cpp and set these parameters: Motors\_number=1, Restart\_from\_the\_origin=1, Np\_ini=2, Np\_max=2.

If you need to get the data of Fig.5 Fig.S2 Fig.S3, you should run the CCmodel\_1v1.cpp to get the Simulation data and set these parameters: Fig5=1. Then you need run analytical\_approximation.m or mean\_field\_approximation.m to get the Calculation data.

If you need to get the data of Fig.S1, you should run the CCmodel\_1v1.cpp to get the CC model data and set these parameters: Fig5=1. And you need run the TOW\_model.cpp to get the TOW model data.

If you need to get the data of Fig.S4, you should run the CCmodel\_1v1.cpp to get the Simulation data and set these parameters: FigS4=1-4.