10 Feb 2021

floating point

groups/projects

- assignment 2: : ZULIP

  submit ONE PDF + source comb.

  everyone submit a short text file saying what contribs.

- project proposal: Mon Feb 20

  1/2 - 1 page. (1-2 refs).

HISTORY. SIR model Kermack + McKendrick

Reed-Frost model. 1927, 1928: 1951. 1952., 1976

SIR: continuous time, continuous pop size, deterministic, overlapping generations

Reed-Frost. DISCRETE time. non-overlapping generations

discrete pop sizes

$$\frac{dS}{dt} = -\beta SI$$

$$\frac{dI}{dt} = \beta SI - \gamma I$$

per-infect prob.

$$I_{t+1} = (I_t - I_t) + S_t\left(1 - (1-p_i)^{I_t}\right)$$

new infections

$1 - (1-p)(1-p_i)(\dots)$

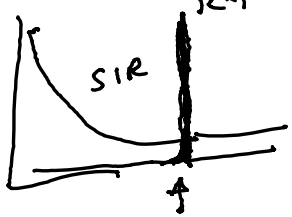
$\overline{inf1}$ $\overline{inf2}$ $inf3 \dots$

deterministic

$$S_{t+1} = S_t - (\text{new inf})$$

$$R_0 = N\left(1 - (1-p_i)^1\right) = p_i N$$

Dirac delta. R-F



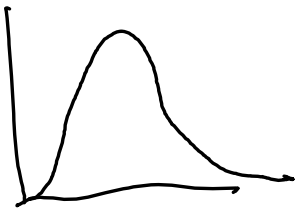
- equilibria, stability …

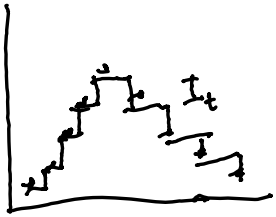
$$X_{t+1} = X_t^* \qquad |\lambda| \gtrless 1 \quad : > 1, \text{ unstable.}$$

modulus

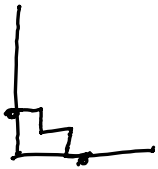
STOCHASTIC : Gaussian?

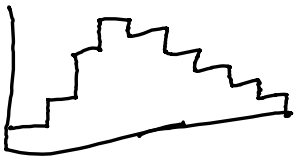
BINOMIAL. $\text{Binom}\left(S_t, 1-(1-p_i)^{I_t}\right)$





REALIZATION





ENSEMBLE