PCA

S countable set of labels for units
(or sites in space)

state space (X_s, d_s) for each $s \in S$ e.g. $\{-, +\}$

$$X = \prod_{s \in S} X_s$$
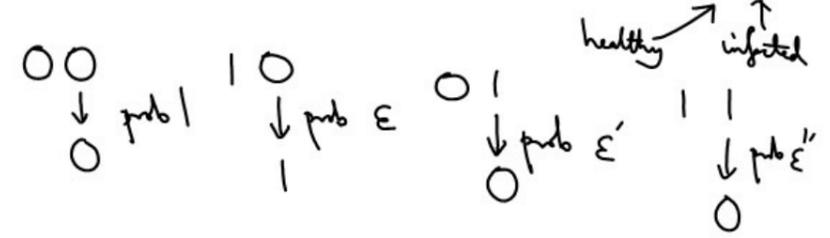
probability transition operator P_s^x on X_s

depending on current $x \in X$, but often only on the state of a neighbourhood $N(s)$ of s

$$P_s^x(x_s') = \text{prob that next time state at } s$$

is x_s', given current state x of whole system

Suppose that given $x \in X$, the sites update independently

e.g. Stavskaya model $S = \mathbb{Z}$ $X_s = \{0, 1\}$

$$\underset{\text{healthy}}{\nearrow} \underset{\text{infected}}{\uparrow}$$

$$\begin{array}{cccc}
O\ O & 1\ O & O\ 1 & 1\ 1 \\
\downarrow \text{prob } 1 & \downarrow \text{prob } \varepsilon & \downarrow \text{prob } \varepsilon' & \downarrow \text{prob } \varepsilon'' \\
O & 1 & O & O
\end{array}$$

$Z = $ zero-charge measures i.e. signed Borel measures λ on X such that $\lambda(X) = 0$

e.g. difference of two probabilities

$$\overset{\frown}{\underset{1}{\cdot} \underset{2}{\cdot}}$$

$\{0, 1, 2\}$