A 3-player game theoretic model of a choice between two queueing systems with strategic managerial decision making

Queues - Examples

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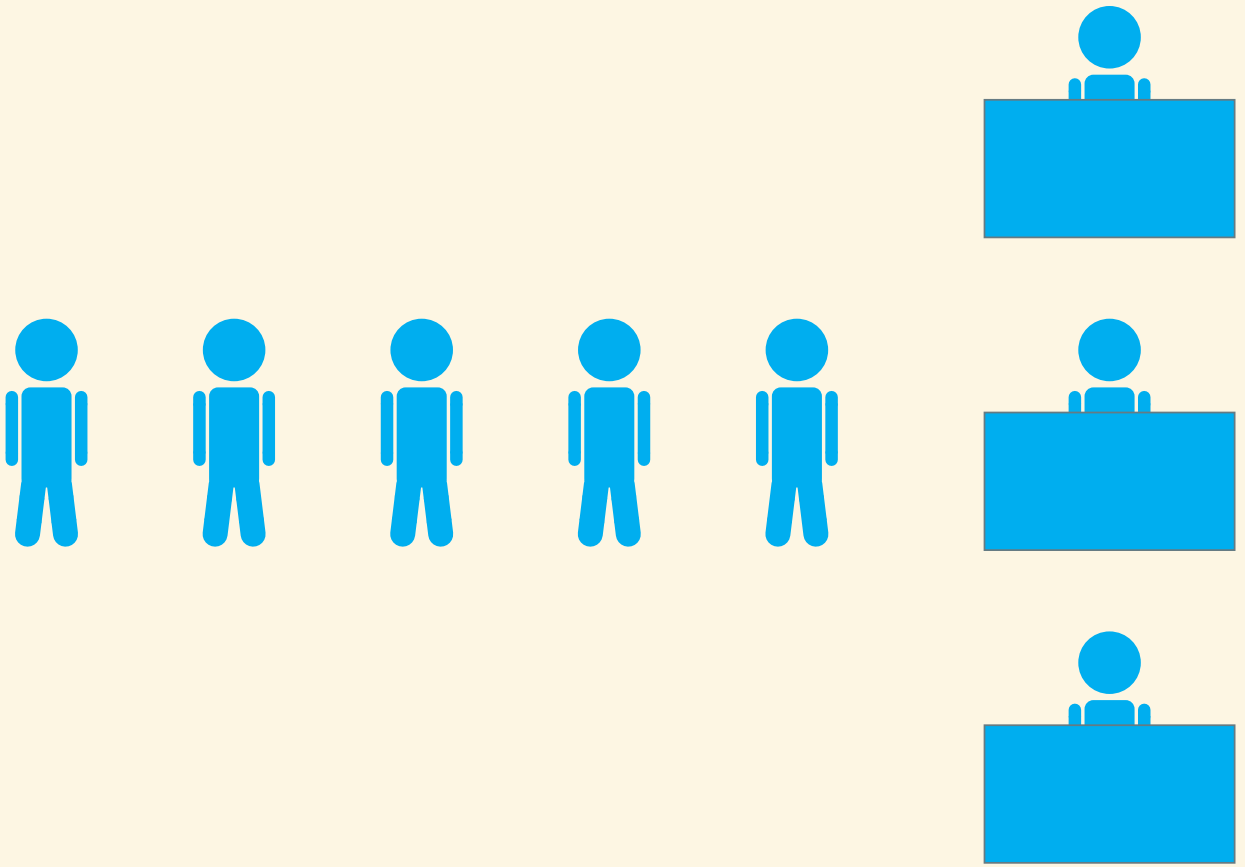
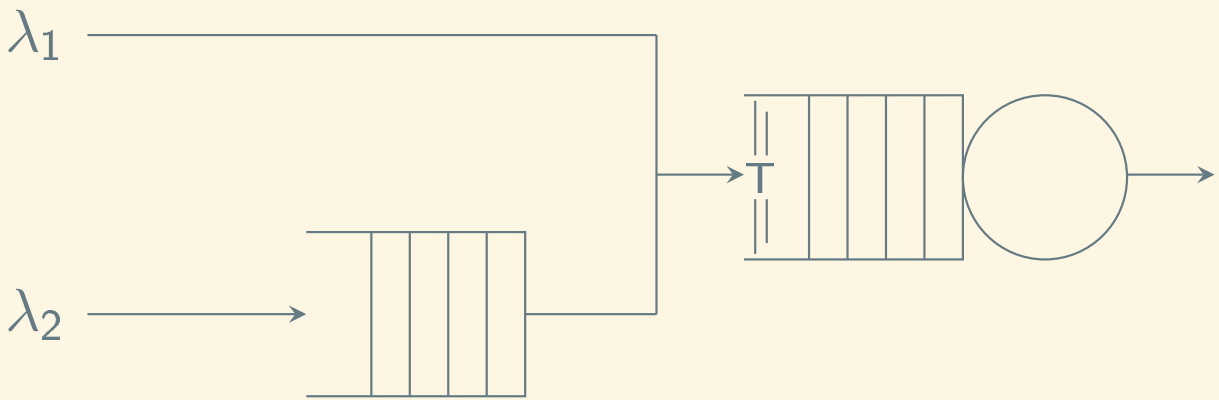
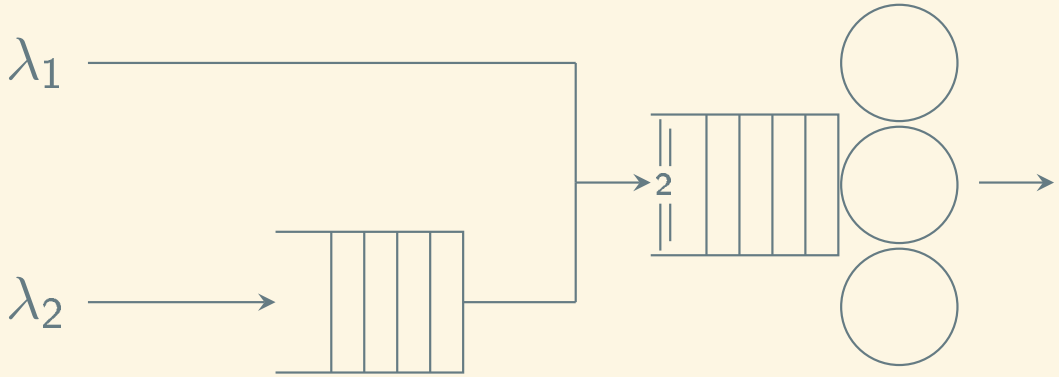


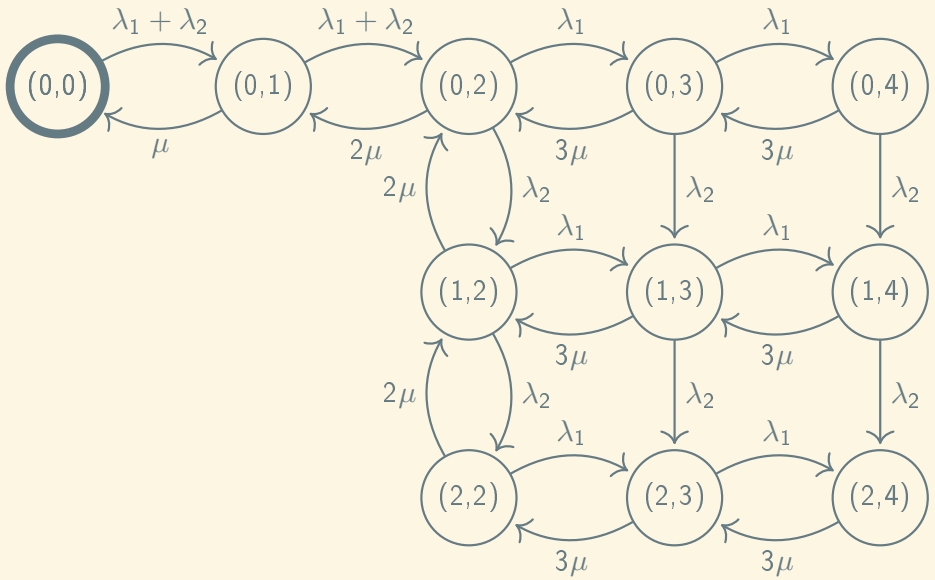
Queues - Examples

Queueing network structure



Markov Chain - Custom network





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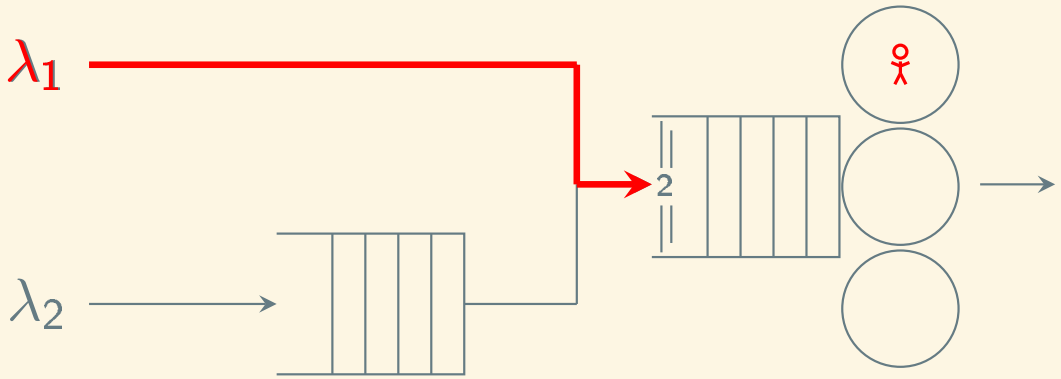

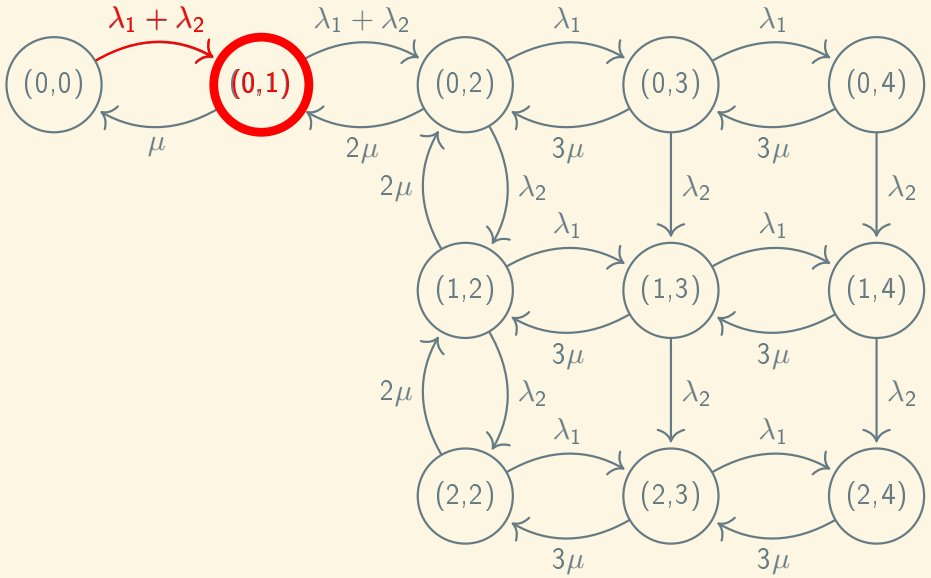

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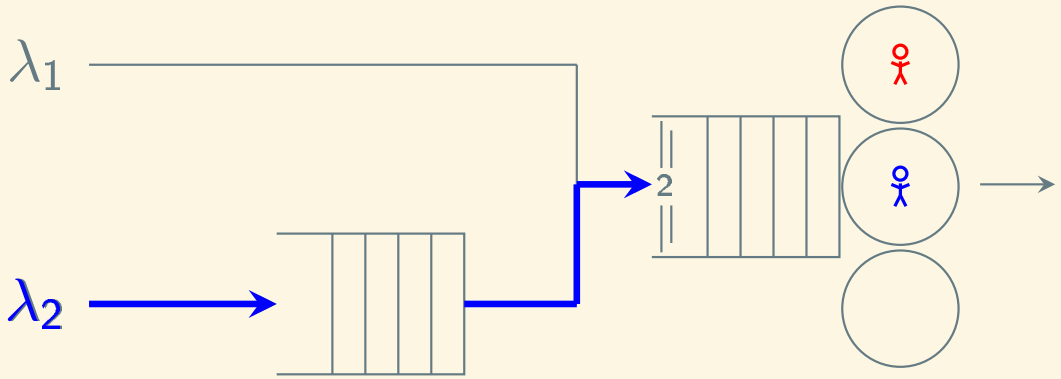

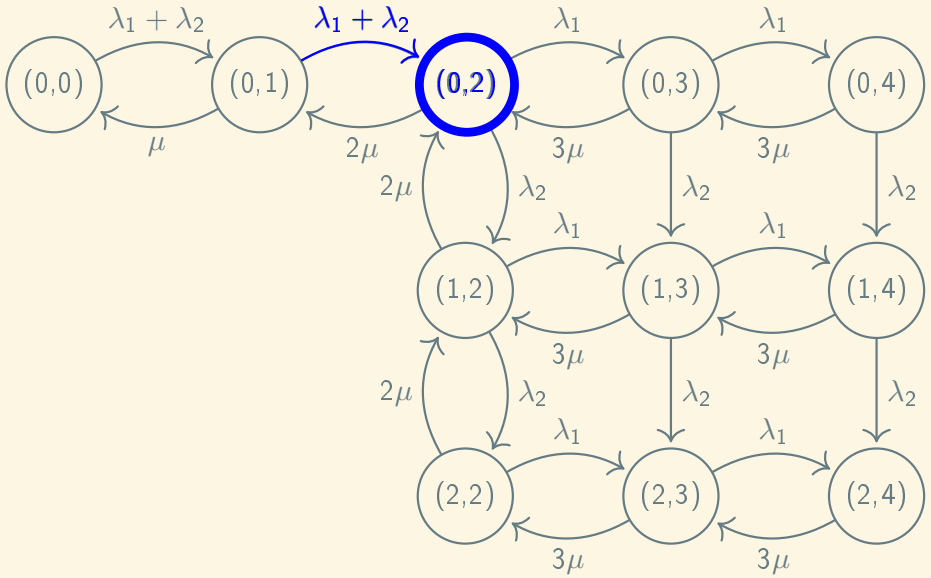

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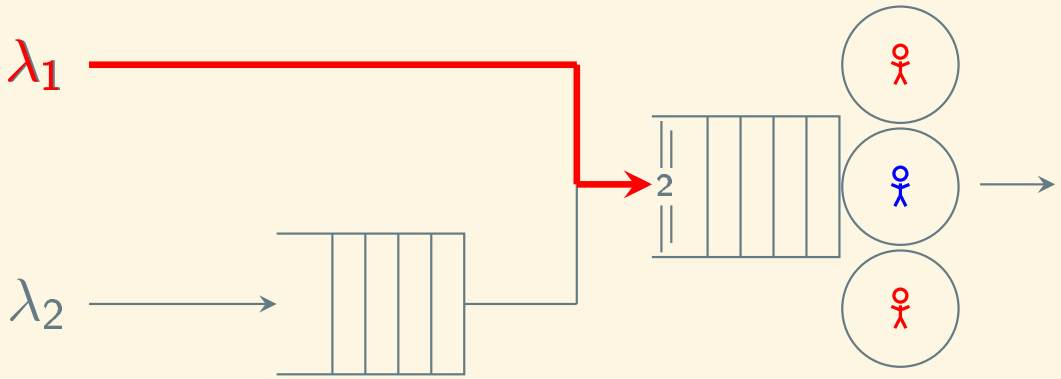
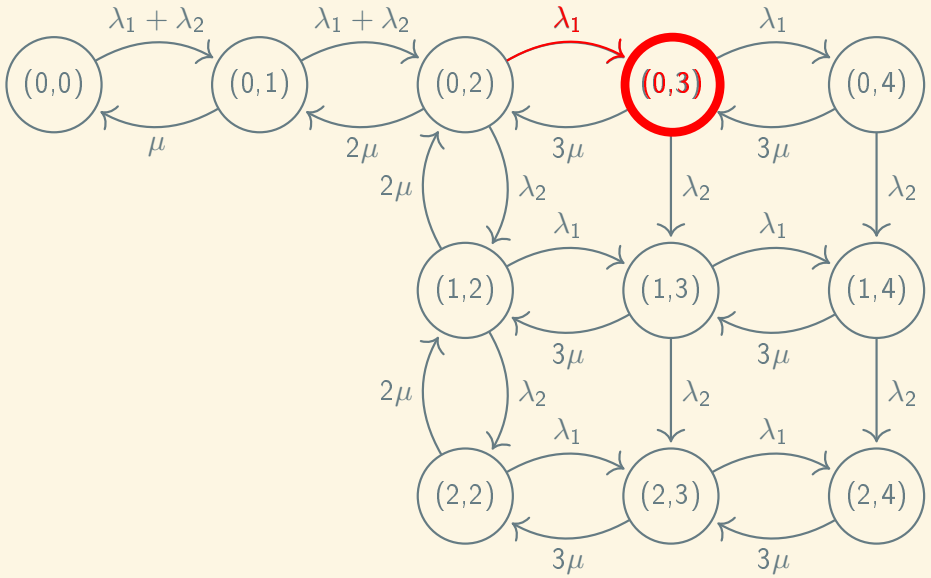
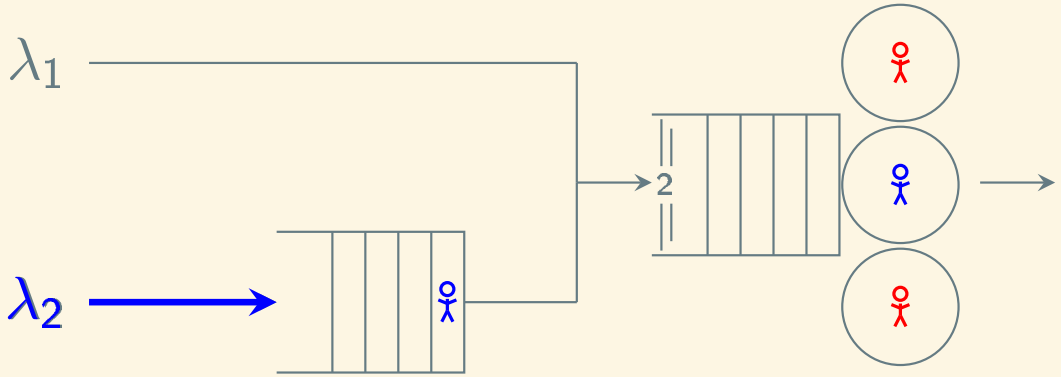
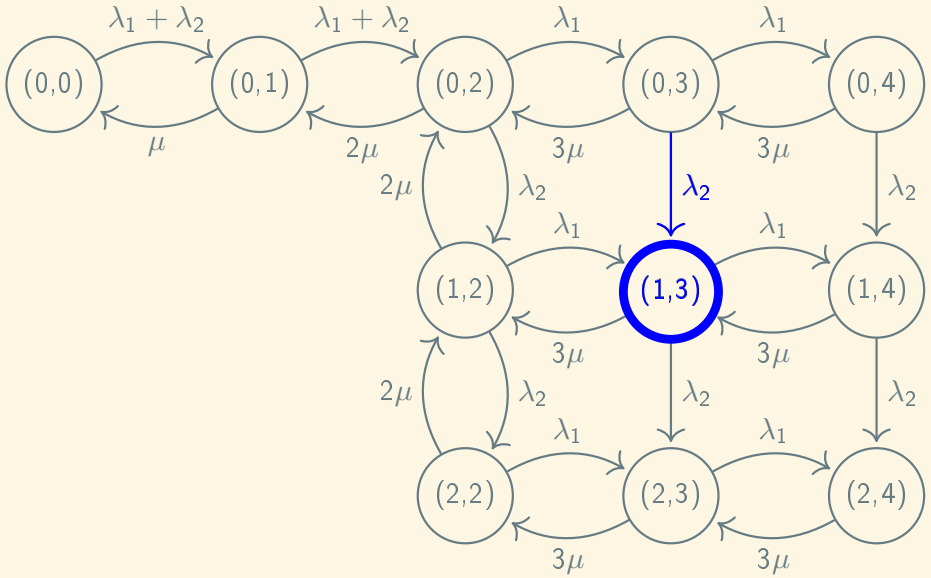


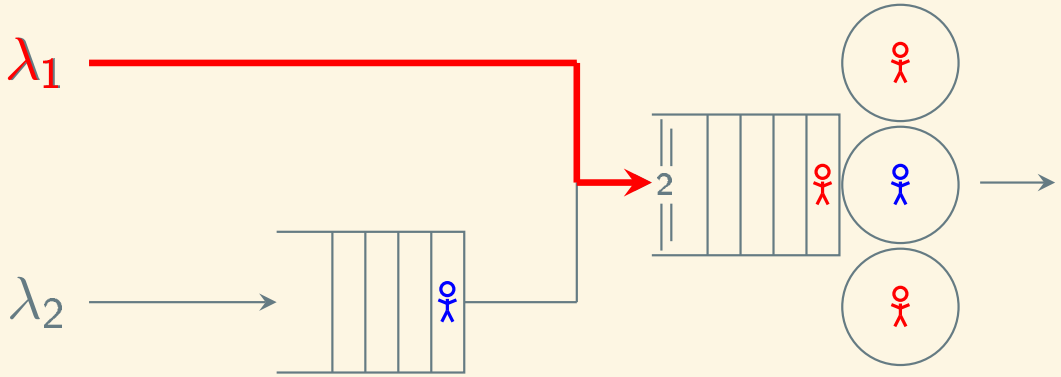


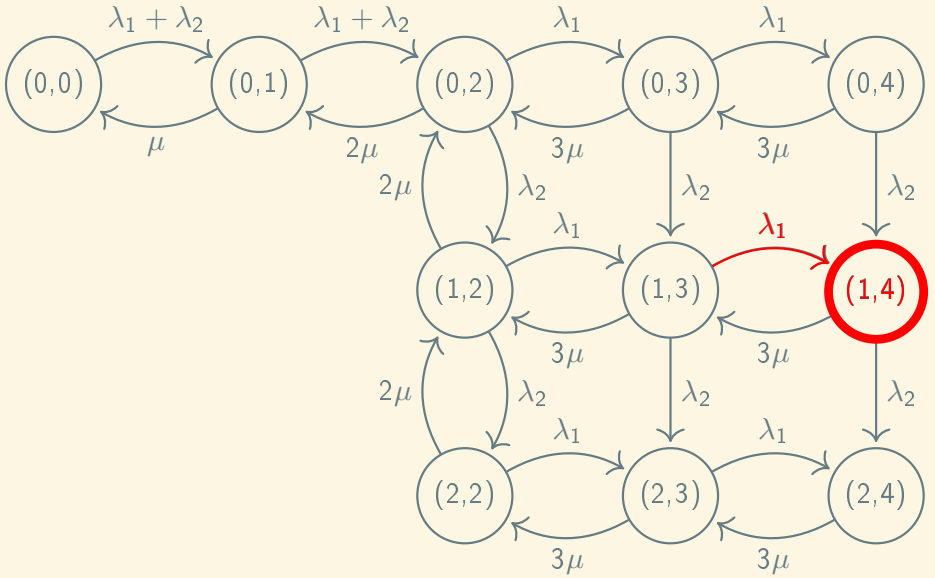
Markov Chain - Custom network



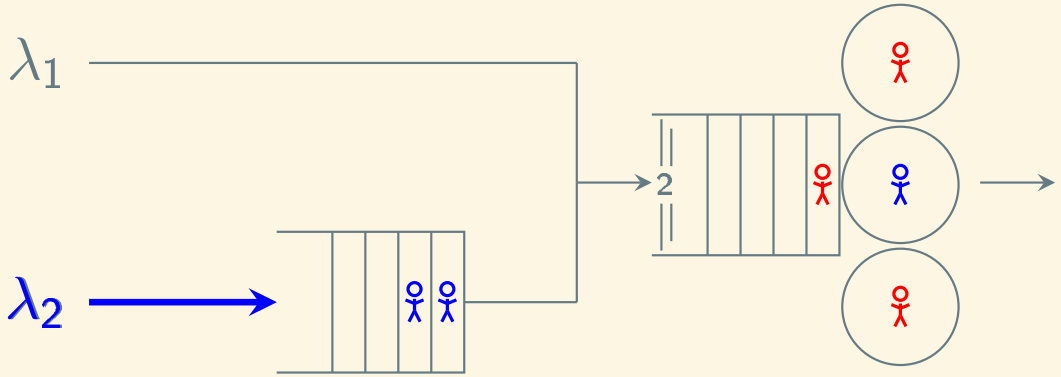


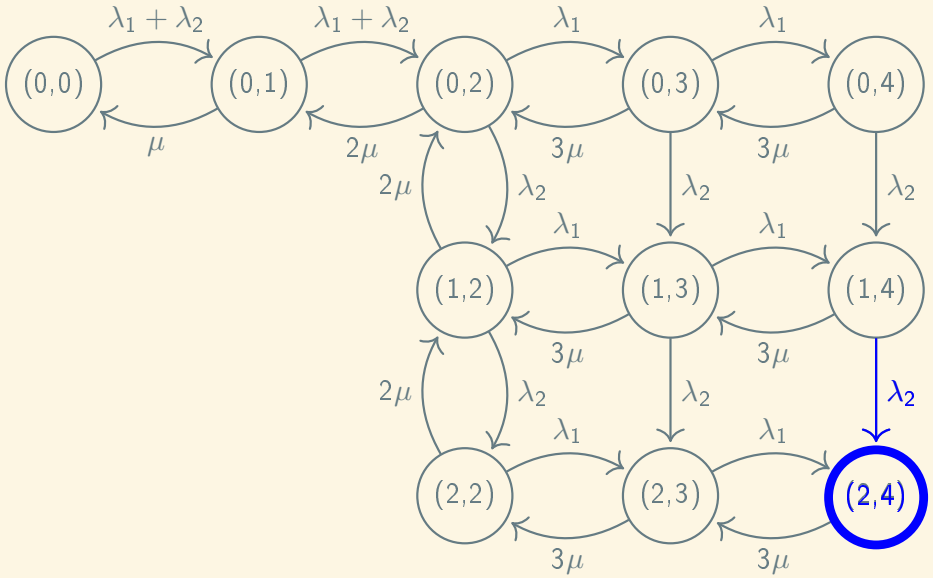
Markov Chain - Custom network



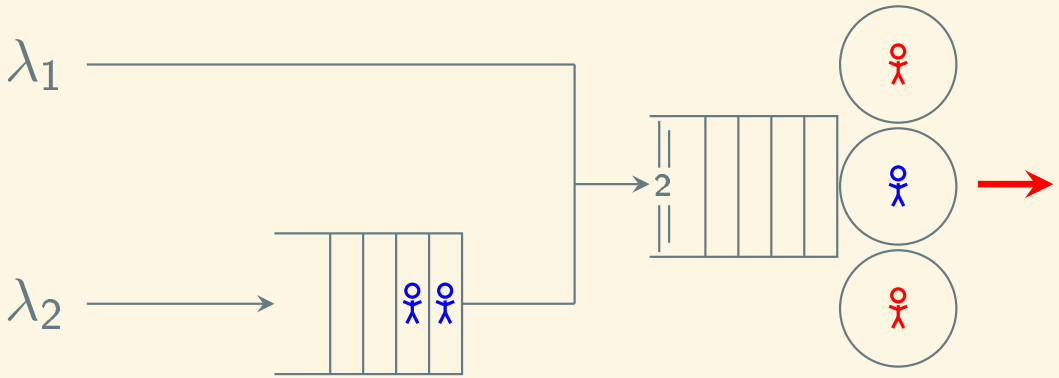


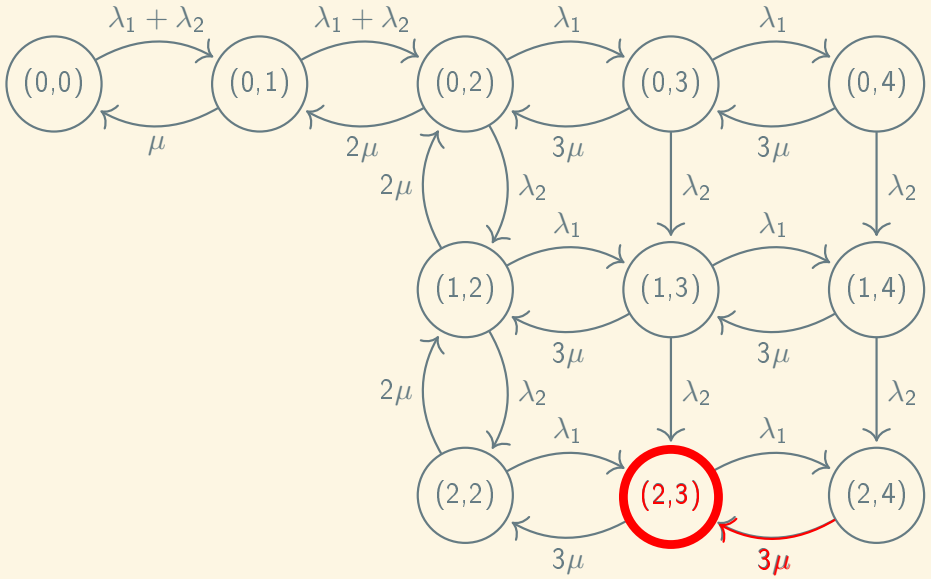
Markov Chain - Custom network



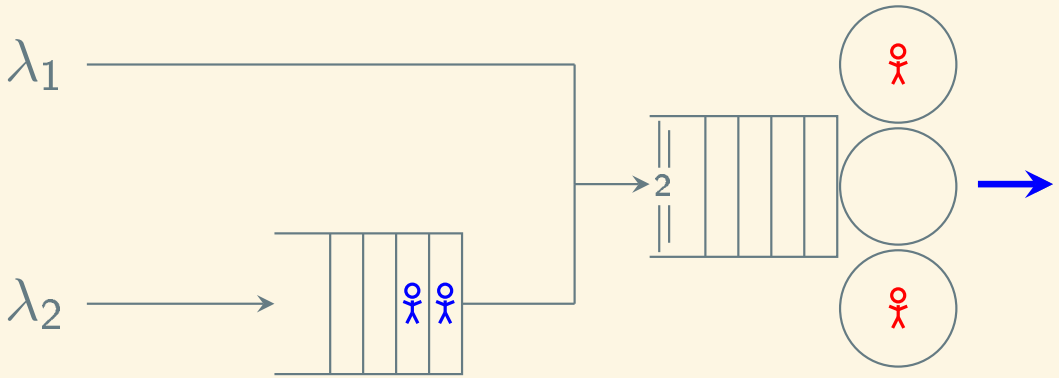


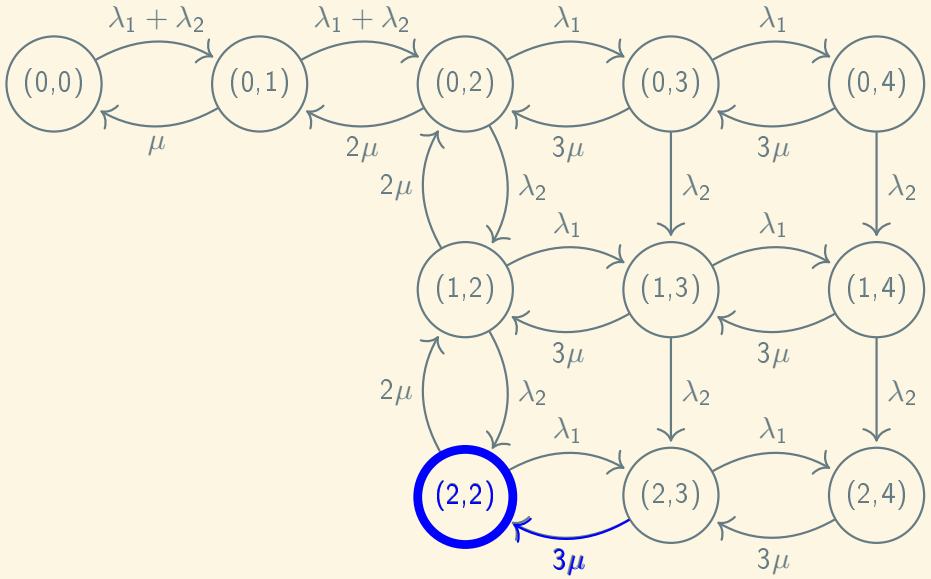
Markov Chain - Custom network



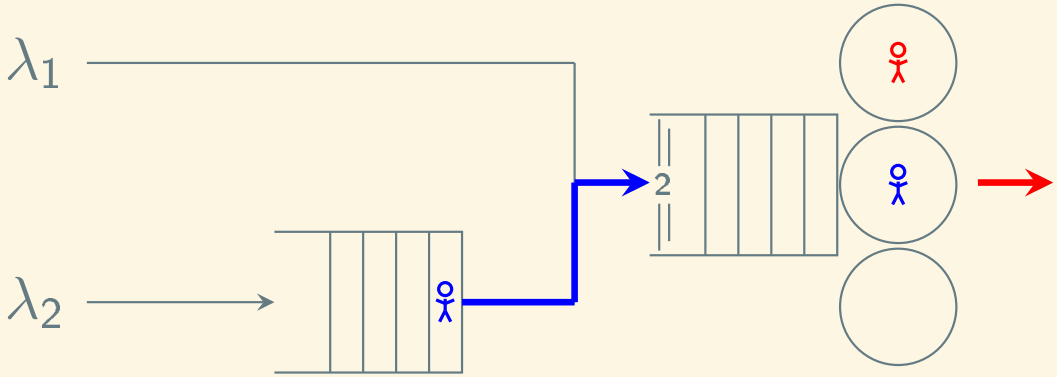


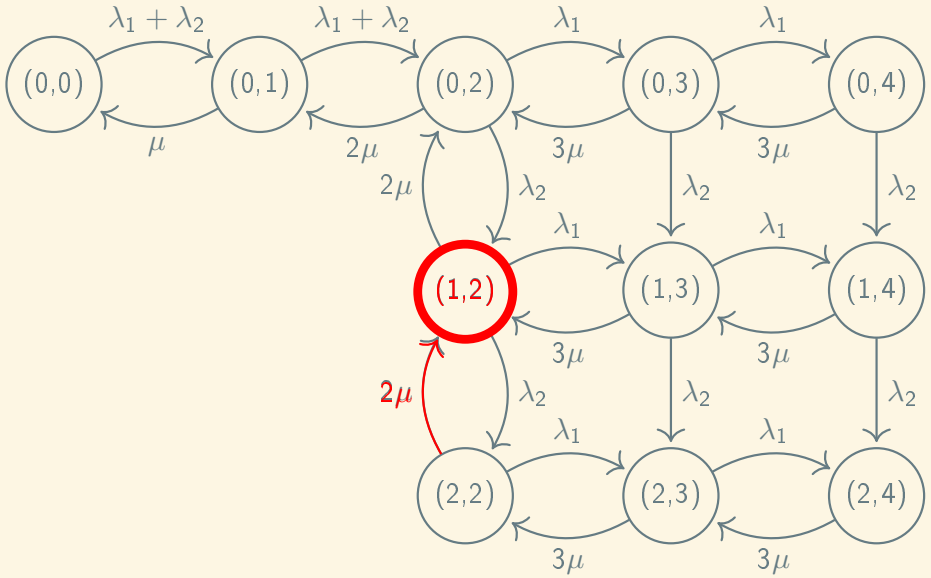
Markov Chain - Custom network





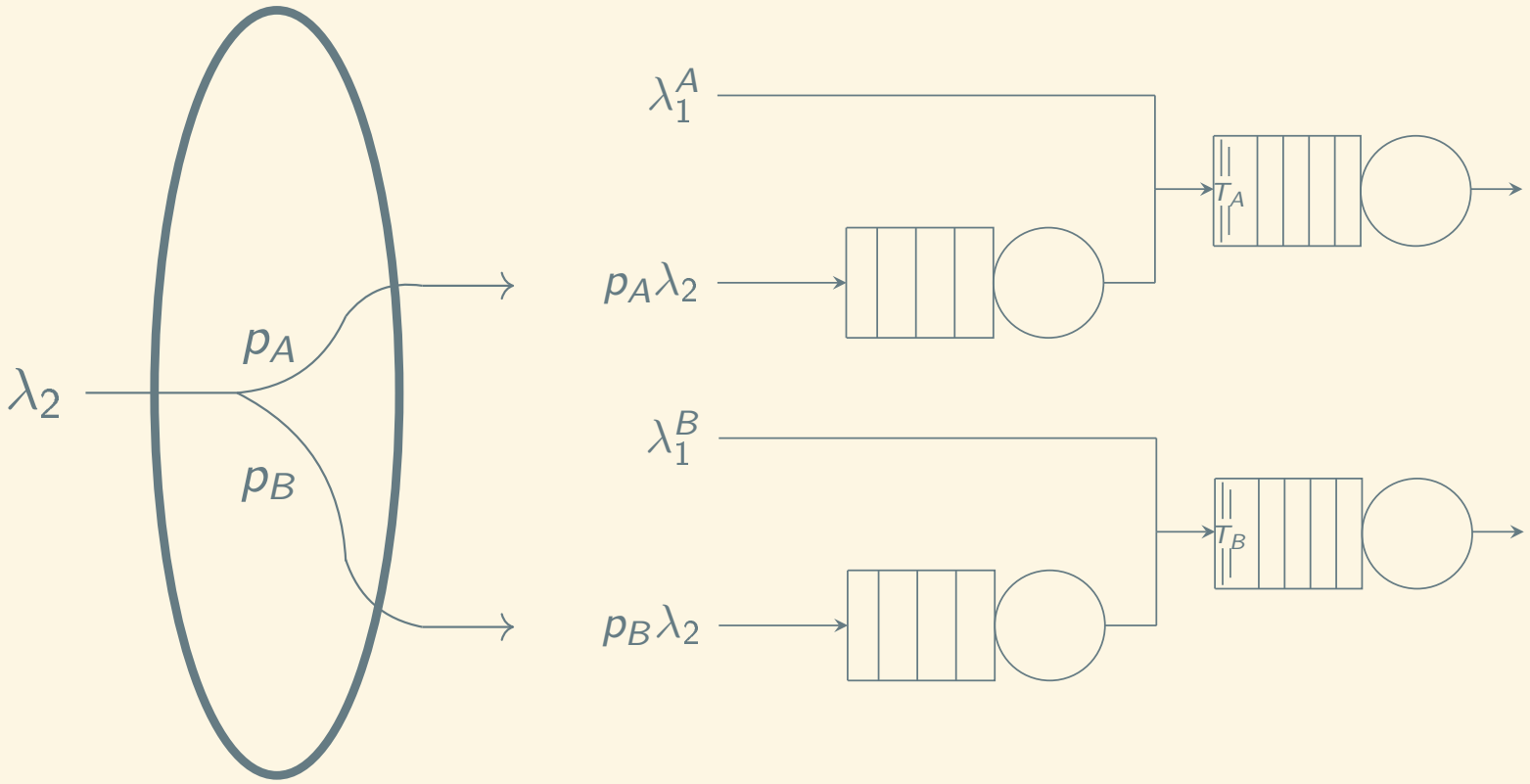
Markov Chain - Custom network



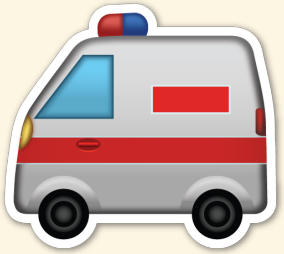


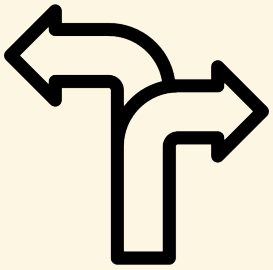
Game - Definition

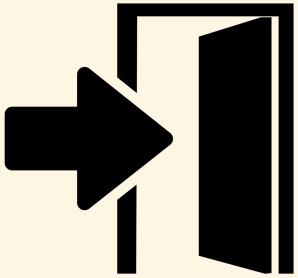
Game - Players

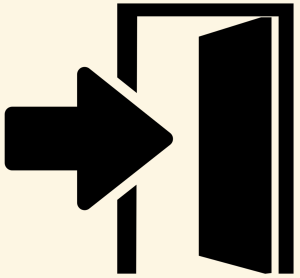


Game - Strategies









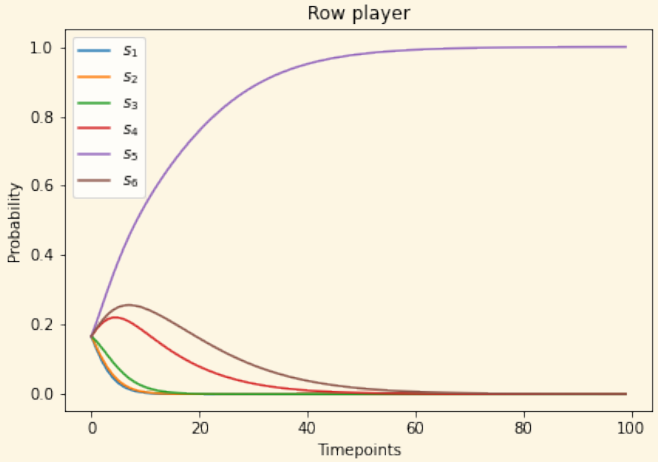
$p_A, p_B \in [0, 1]$

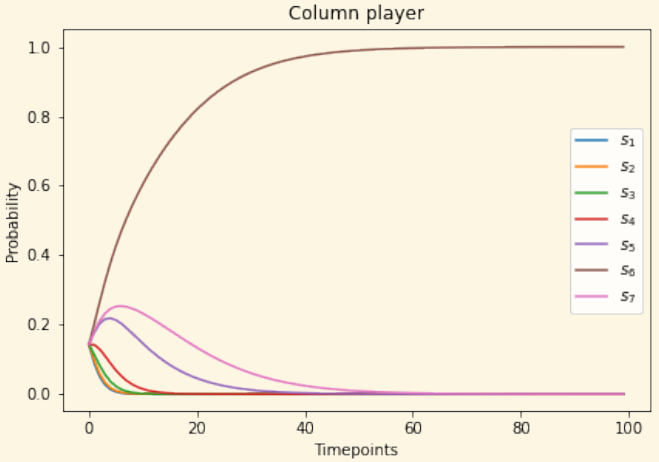
$T_A \in [1, N_A]$

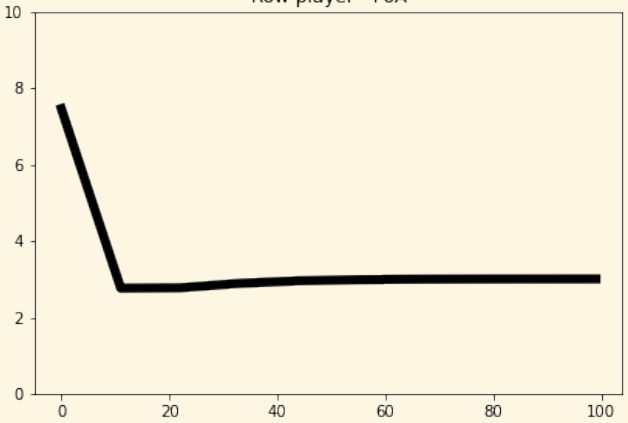
$T_B \in [1, N_B]$

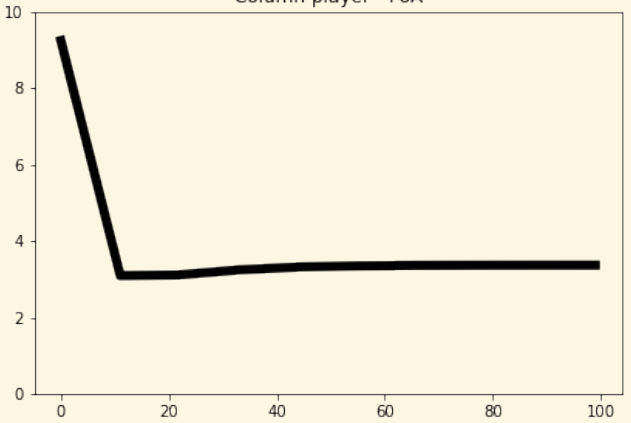
$p_A + p_B = 1$

Learning algorithms - Asymmetric replicator dynamics



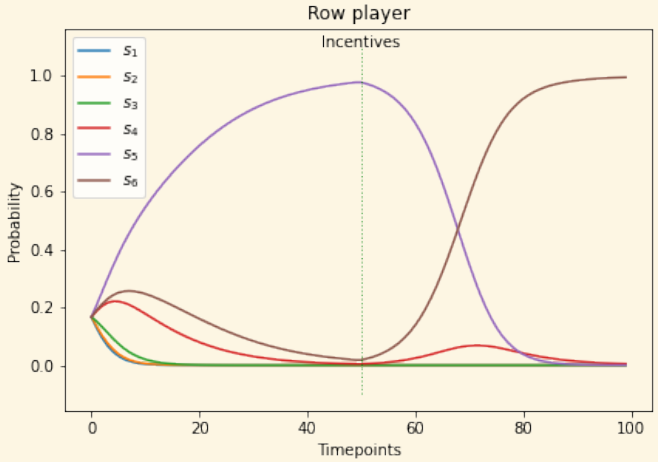


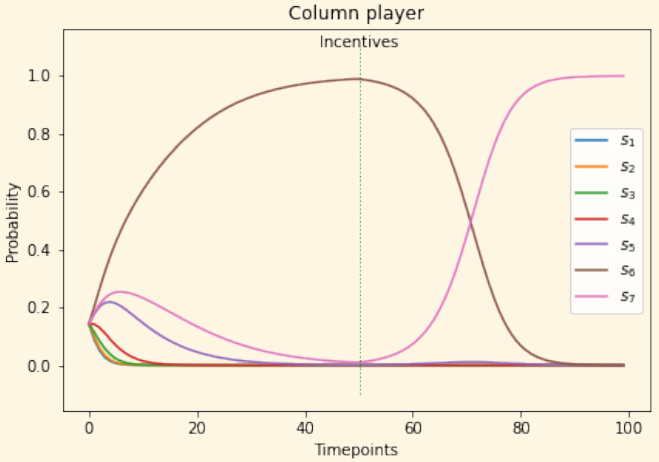


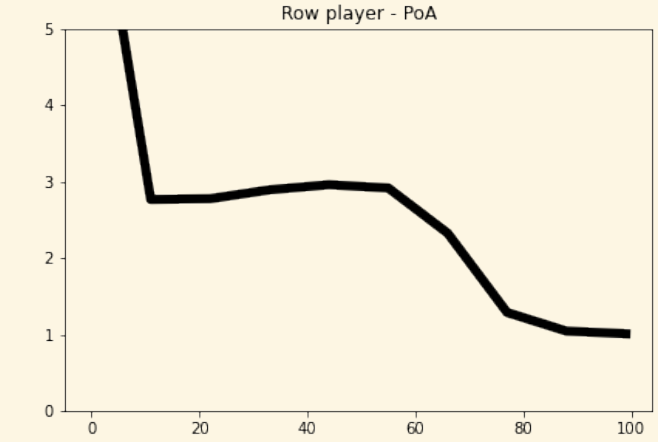


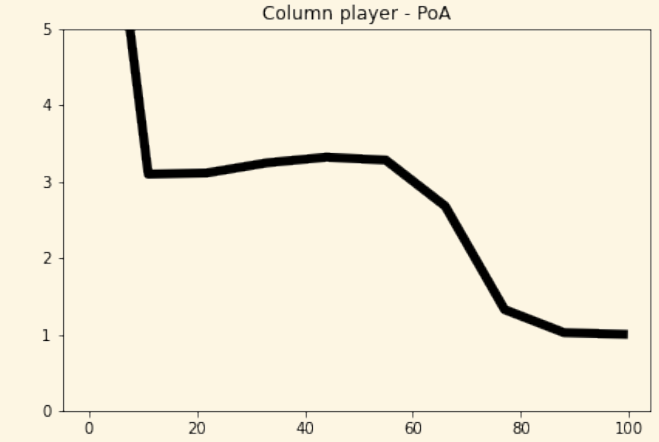
“Inefficiencies can be learned and emerged naturally in an interactive system”

Learning algorithms - Asymmetric replicator dynamics





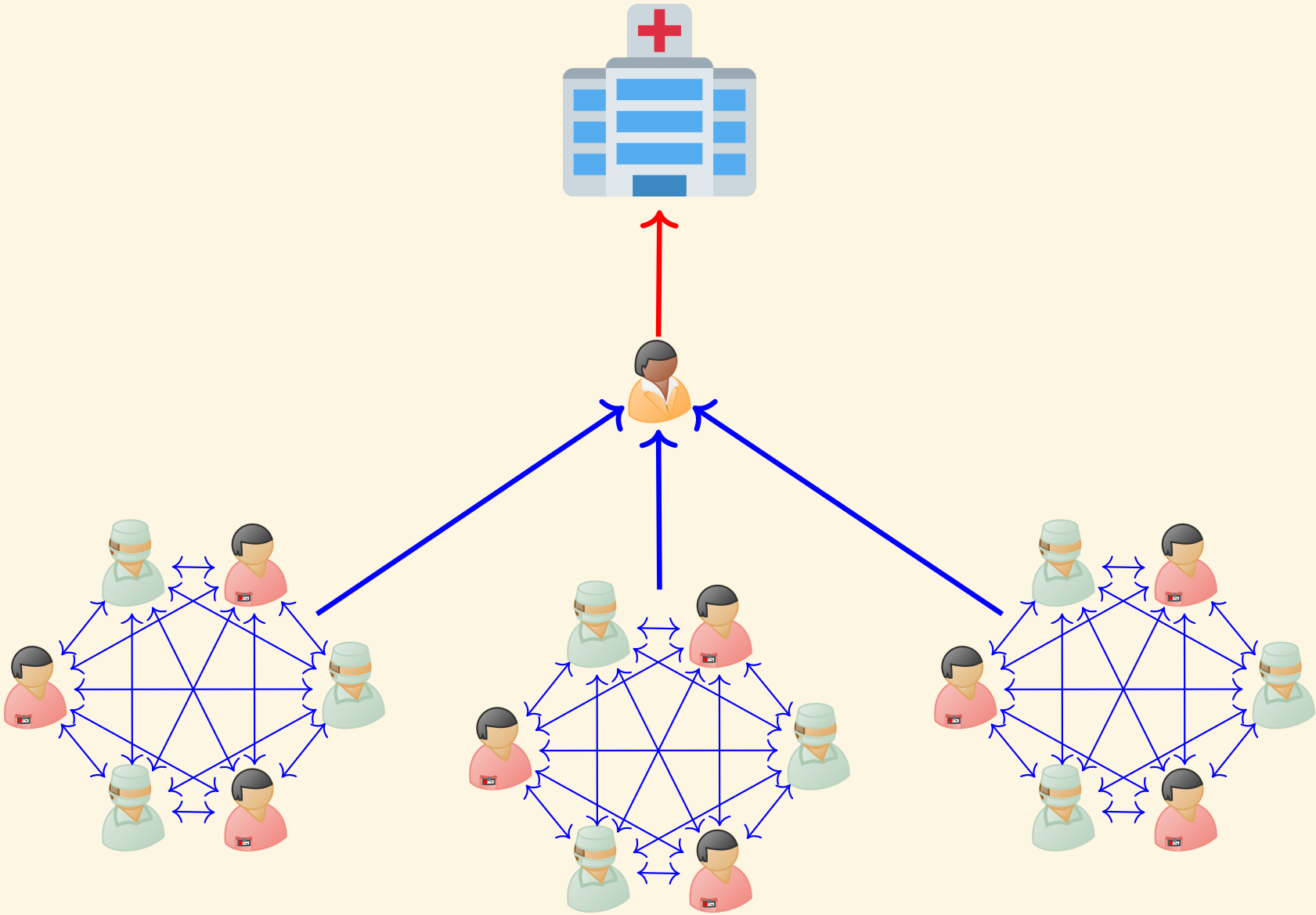




“Targeted incentivisation of behaviours can help escape learned inefficiencies”

Ethnography?

Potential future model



Interfaces and transfers study

1. Ambulance Control Centre
   - Patients are translated into objects of practise for EMS workers
2. Emergency Medical Services
   - Organising logic (clinical, patient, collaborative)
   - Patients are translated into an object of practise for ED workers
3. Emergency Department
   - Sense making process to determine care trajectory
   - Clinical logics (treatment, care)
   - Management logics (resource utilisation, targets)