Patient and Doctor scheduling using RL

Dummy dataset

DoctorID	DoctorName	Specialty
D01	Doctor 1	Cardiology
D02	Doctor 2	Orthopedics
D03	Doctor 3	Dermatology
D04	Doctor 4	Pediatrics
D05	Doctor 5	Ophthalmology

Doctor.csv

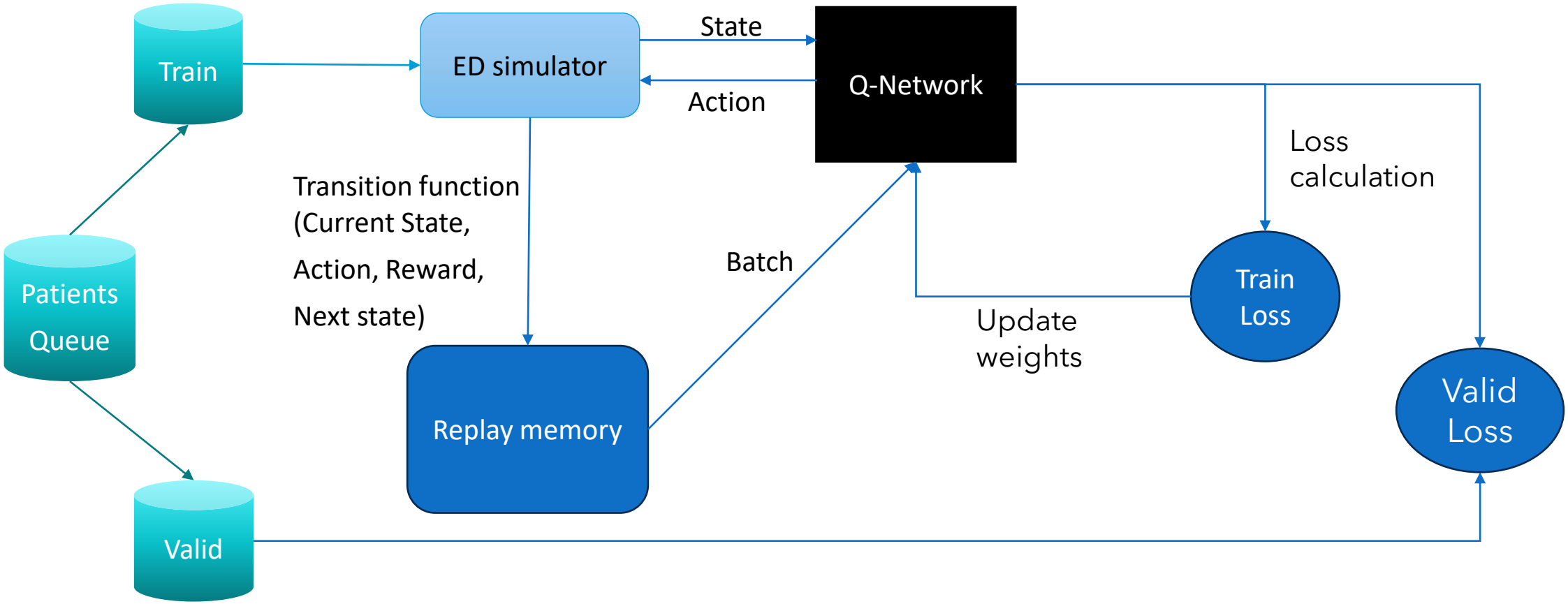
PatientID	PatientName	UrgencyLevel	AssignedDoctorID
P001	Patient 1	4	D03
P002	Patient 2	2	D04
P003	Patient 3	3	D04
P004	Patient 4	1	D01
P005	Patient 5	1	D01
P006	Patient 6	4	D02
P007	Patient 7	5	D05
P008	Patient 8	4	D05
P009	Patient 9	5	D01
P010	Patient 10	5	D01
P011	Patient 11	3	D02
P012	Patient 12	4	D02
P013	Patient 13	5	D01

Patient.csv

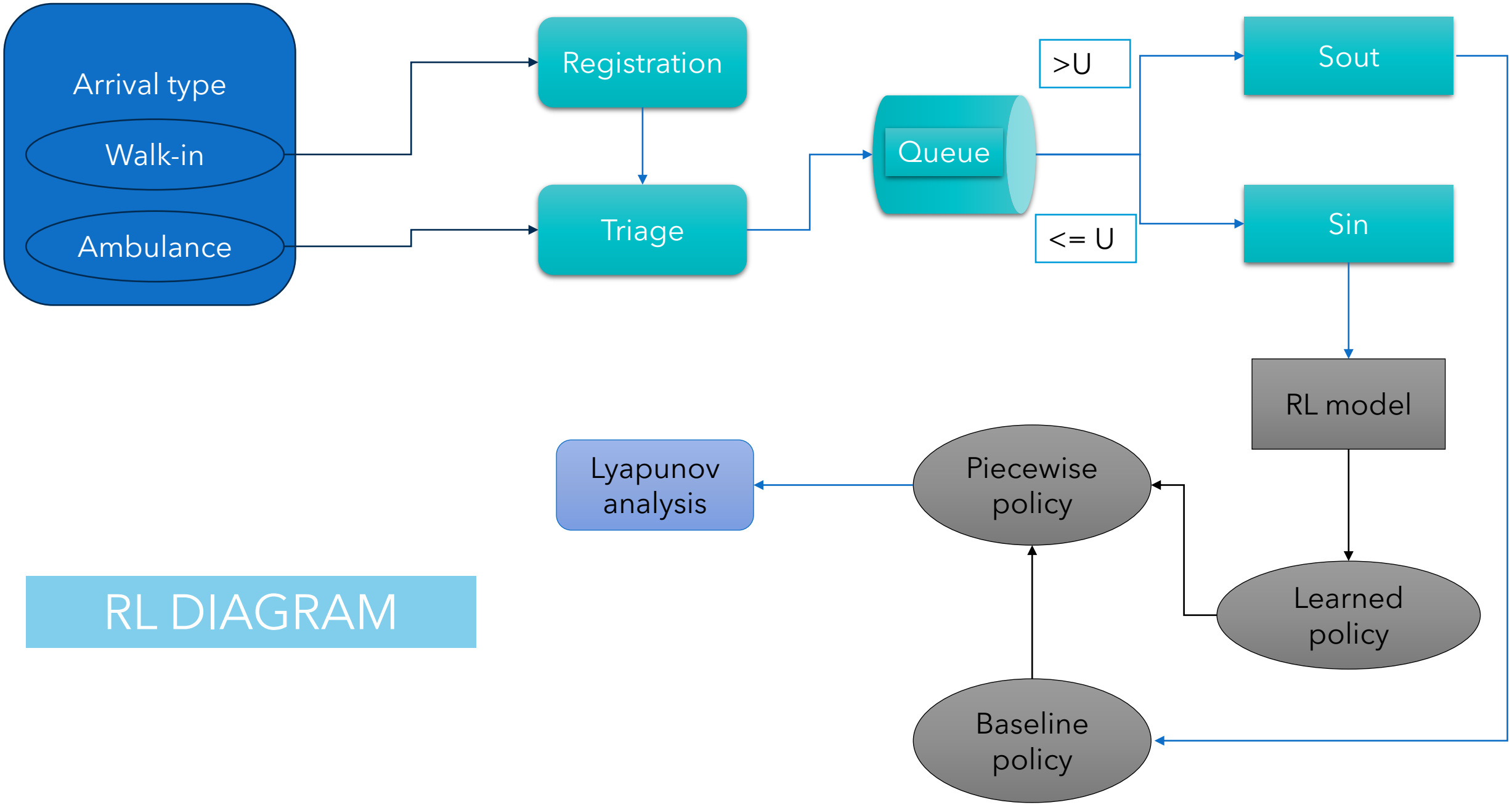
Bounded and unbounded state space

Bounded State space: If a state space is based on number of beds, number of nurses, number of doctors working in ED it'll be bounded as we'll know beforehand the upper bound of every feature.

Unbounded State space: If the state space is based upon number of patients, the disease they've, etc.



Data Flow and RL diagram


Arrival type
Walk-in
Ambulance
Registration
Triage
Queue
>U
<= U
Sout
Sin
RL model
Piecewise policy
Lyapunov analysis
Learned policy
Baseline policy

RL DIAGRAM

References

- Reinforcement Learning for Optimal Control of Queueing Systems: https://www.mit.edu/~modiano/papers/CV_C_230.pdf
- SIM-PFED: https://research.chalmers.se/publication/525306/file/525306_Fulltext.pdf
- Improving Emergency Department Efficiency by Patient Scheduling Using Deep Reinforcement Learning - PubMed (nih.gov)
- Improving the Efficiency of an Emergency Department Based on Activity-Relationship Diagram and Radio Frequency Identification Technology - PubMed (nih.gov)