1 Data

Table 1: List of Global Variables

Name	Description	Initial Value
NextPatIdNum	The Id number that will be assigned to the next patient	1
NextReceptionistIdNum	The Id number that will be assigned to the next receptionist	1
NextCTMachineIdNum	The Id number that will be assigned to the next CT Machine	1
P	The set of all patients	$\emptyset$
R	The set of all receptionists	$\emptyset$
C	The set of all CT Machines	$\emptyset$

Table 2: List of Data Modules

Name	Description	Inputs	Outputs
PatientInterArrival	The time between arrivals of patients	Mean interarrival time	Exponentially distributed random variable
NumReceptionists	The number of receptionists		-
NumCTMachines	The number of CT Machines	-	-
CheckInTime	Returns the time taken for the patient to check in with the receptionist	Min and max time	Uniformly distributed check in time
ScanTime	Returns the time taken for the patient to be scanned in the CT Machine	Mean and std. dev.	Log-normally distributed scan time

2 Components

Table 3: List of Entities

Entity	Attributes
Patient	ID State StateTimes
Receptionist	ID State StateTimes
CT Machine	ID State StateTimes

Table 4: List of Transitions

No.	Participant(s)	From Event(s)	To Event(s)
1	Patient(p)	Arrive(p)	Wait for check in.Start(p)
2	Patient(p), Receptionist(r)	Wait for check in.End(p) Wait for task.End(r)	Check in.Start(p, r)
3	Patient(p), Receptionist(r)	Check in.End(p, r)	Wait for scan.Start(p) Wait for task.Start(r)
4	Patient(p), CT Machine(c)	Wait for scan.End(p, o) Wait for task.End(c)	Scan.Start(p, c)
5	Patient(p), CT Machine(c)	Scan.End(p, o)	Leave.Start(p) Wait for task.Start(c)
6	Receptionist(r)	Arrive(r)	Wait for task.Start(r)
7	Receptionist(r)	Wait for task.End(r)	Leave(r)
8	CT Machine(c)	Arrive(c)	Wait for task.Start(c)
9	CT Machine(c)	Wait for task.End(c)	Leave(c)

Table 5: Activities

Activity	Participants	Event	Type	State Change
Wait for check in	Patient(p)	Start	Scheduled	1: TRIGGER OnStartWaitForCheckIn WITH p
		End	Controlled	
Check in	Patient(p), Reception-ist(r)	Start	Scheduled	1: SCHEDULE Check in.End at TIME + CheckInTime()
		End	Scheduled	1: TRANSITION 3 WITH p, r
Wait for scan	Patient(p)	Start	Scheduled	1: TRIGGER OnStartWaitForScan WITH p
		End	Controlled	
Scan	Patient(p), CT Machine(c)	Start	Controlled	1: SCHEDULE Scan.End at TIME + ScanTime()
		End	Scheduled	1: TRANSITION 5 WITH p, c
Wait for task (R)	Reception-ist(r)	Start	Scheduled	1: TRIGGER OnStartWaitForTaskR WITH r
		End	Controlled	
Wait for task (CT)	CT Machine(c)	Start	Scheduled	1: TRIGGER OnStartWaitForTaskCT WITH c
		End	Controlled	

Table 6: Events

Event	Participants	Type	State Change
Arrival (P)	Patient(p)	Scheduled	1: p.ID = NextPatIDNum 2: p.Priority = PatientPriority() 3: NextPatIDNum = NextPatIDNum + 1 4: SCHEDULE Patient Arrival at TIME + PatientInterArrival() 5: TRANSITION 1 WITH p
Leave (P)	Patient(p)	Scheduled	1: Calculate statistics for p
Arrival (R)	Reception-ist(r)	Scheduled	1: r.ID = NextReceptionistIDNum 2: NextReceptionistIDNum = NextReceptionistIDNum + 1 3: **if** NextReceptionistIDNum ≤ NumReceptionists **then** 4: SCHEDULE Arrival (R) at TIME 5: **end if** 6: TRANSITION 6 WITH r
Leave (R)	Reception-ist(r)	Scheduled	1: Calculate statistics for r
Arrival (CT)	CT Machine(c)	Scheduled	1: c.ID = NextCTMachineIDNum 2: NextCTMachineIDNum = NextCTMachineIDNum + 1 3: **if** NextCTMachineIDNum ≤ NumCTMachines **then** 4: SCHEDULE Arrival (CT) at TIME 5: **end if** 6: TRIGGER OnCTMachineArrive WITH c 7: TRANSITION 8 WITH c
Leave (CT)	CT Machine(c)	Scheduled	1: Calculate statistics for c

3 Activity Diagrams

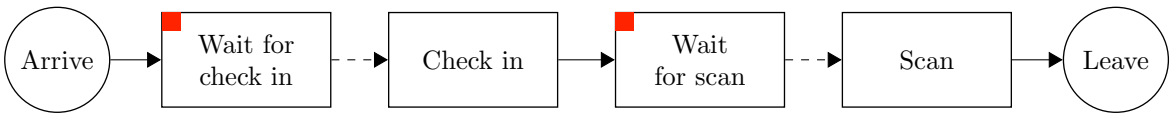

Figure 1: Patient Activity Diagram

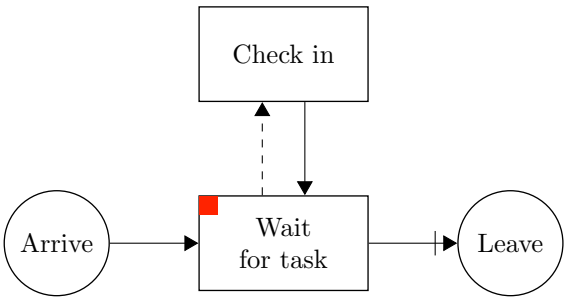

Figure 2: Receptionist Activity Diagram

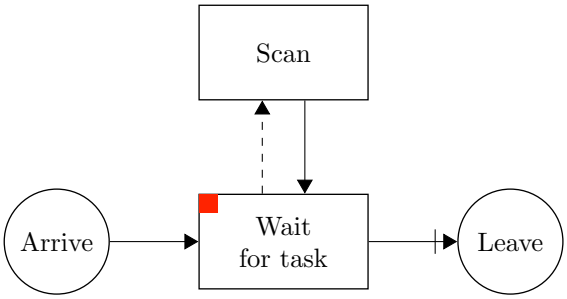

Figure 3: CT Machine Activity Diagram

4 Control Policies

Table 7: On Start Wait for Check In

Triggered by	Patient p
1: $\mathcal{R} = \{r \in R \mid r.\text{State} = \text{Wait for task (R)}\}$	
2: **if** $\mathcal{R} \neq \emptyset$ **then**	
3: $\hat{r} = \arg\min\{r.\text{Current Start} \mid r \in \mathcal{R}\}$	
4: TRANSITION 2 WITH p and $\hat{r}$	
5: **end if**	

Table 8: On Start Wait For Scan

Triggered by	Patient p
1: $\mathcal{C} = \{c \in C \mid c.\text{State} = \text{Wait for task (C)}\}$	
2: **if** $\mathcal{C} \neq \emptyset$ **then**	
3: $\hat{c} = \arg\min\{c.\text{Current Start} \mid c \in \mathcal{C}\}$	
4: TRANSITION 4 WITH p and $\hat{c}$	
5: **end if**	

Table 9: On Start Wait For Task (receptionist)

Triggered by	Receptionist r
1: $\mathcal{P} = \{p \in P \mid p.\text{State} = \text{Wait for check in}\}$	
2: **if** $\mathcal{P} \neq \emptyset$ **then**	
3: $\hat{p} = \arg\min\{p.\text{Current Start} \mid p \in \mathcal{P}\}$	
4: TRANSITION 2 WITH r and $\hat{p}$	
5: **end if**	

Table 10: On Start Wait For Task (CT Machine)

Triggered by	CT Machine c
1: $\mathcal{P} = \{p \in P \mid p.\text{State} = \text{Wait for scan}\}$	
2: **if** $\mathcal{P} \neq \emptyset$ **then**	
3: $\hat{p} = \arg\min\{p.\text{Current Start} \mid p \in \mathcal{P}\}$	
4: TRANSITION 4 WITH r and $\hat{p}$	
5: **end if**	