Mission specification and functional properties mission1 = (CleanRoom, location = RoomA)mission2 = (CleanRoom, location = RoomB)Stage Two mission3 = (MoveFurniture, location = RoomD)mission2 = (CleanPatientRoom, location = RoomC)Functional properties Contraint solver (Alloy) model - minimize travelling cost abstract sig Mission{} abstract sig Robot {} Atomic and composite World Model Graph abstract sig AtomicTask {} Mobile objects abstract sig CompositeTask{} tasks description CleanRoom run TaskAllocation for exactly 4 Mission... Room MoveFurniture Room Room non-ordered 2 robots 40 min CleanFloor SanitizeRoom Multiple configurations of tasks allocated to robots 1 robots 1 robots 60 min Atomic Task Composite Task Property associated to CleanPatientRoom ordered CleanRoom GetPermission non-ordered 1 robots Robots available and Robot1 Robot2 location: warehouse? capabilities they posses type: Pick-n-Place type: Cleaner Stage Three Logic Property to Synthesis plans Markov Decision Process model (in PRISM) for each task allocation configuration Rmin=?[$\varphi_1 \wedge \varphi_2 \wedge \varphi_3$] label "r1_done" = (r1_task21=true) & (r1_task22=true) & (r1_task12=true): label "r2_done" = (r2_task10=true) & (r2_task11=true); Best policy synthesized module R1 r1 : [0..3]; //0 - initial position of robot 1 r1_task21 : bool: [r1_cost0_1] r1=0 & r1_task21=false -> (r1' = 1) & (r1_task21'=true); [r1_cost0_2] r1=0 & r1_task_at22=false -> (r1' = 2) & (r1_task22'=true); 06:00 time unite

Stage One