package dressingcontrol imports SDressingControl movementStart: Position FrankaArmControl SensorOperations R HRIOperations currentJoint: int = 2 garmentAcquired: boolean = false **X** garmentWithUser: boolean = false xtargetPosition: Position forceEnd: CompletionStatus arrivedAtTarget: boolean = false isHandlingCorrect: boolean = false isGripperEngaged: boolean = false firstArmDressed: boolean = false userPose: vector(Position,6) **X** garmentPosition: Position forceStart: Position forceResult: CompletionStatus

DressingEvents GarmentAcquisition GarmentToUser DressingLoop SecondArm garmentAtHand entry garmentAcquired = false dressingRequest GripGarment invalidPoseDetected DetectStartPose [garmentAcquired] [garmentWithUser] entry detectUserPose() [firstArmDressed] userInterrupt poseDetected: vector(Position,6) FindSecondShoulder LookingForGarment [currentJoint>0]/currentJoint = currentJoint-1 DetectUserPose entry detectUserPose() entry detectGarment() entry detectUserPose() garmentDetected: Position gripCorrect: boolean poseDetected?userPose/targetPosition = jointPosition(userPose, 0, 2) garmentDetected?garmentPosition <{1} gripperEngaged: boolean poseDetected?userPose/targetPosition = jointPosition(userPose, 1, 2) correctedMovement Moving Moving entry movementStart!garmentPosition entry movementStart!targetPosition  $pose Detected? user Pose [current Joint == 0 \ | nt == 1 \ | current Joint == 2]/target Position = joint Position \ user Pose, 0, current Joint)$ MoveToSecondShoulder entry movementStart!targetPosition arrivedAtGarment [not isGripperEngaged] movementEnd MovingToJoint garmentGripped entry forceStart!targetPosition /correctedMovement EngageGarment movementEnd/garmentAtHand; garmentWithUser = true entry grip() gripTimeoutHRI [forceResult==CompletionStatus::InvalidPose] dressedJoint: int SnaggingCorrection orientedGarment gripperEngaged?isGripperEngaged handlingCorrect: boolean CheckGrip CheckingUserDressed forceEnd?forceResult entry checkUserDressed() [forceResult==CompletionStatus::SnaggingDetected] [isGripperEngaged]/garmentGripped ReleaseGrip confirmGripCorrectentry releaseGrip() entry checkCorrectHandling() [forceResult==CompletionStatus::Success]/dressedJoint!currentJoint [not isHandlingCorrect]/reorientGarment() handlingCorrect?isHandlingCorrect [sinceEntry(GripGarment)>6]/gripTimeoutHRI [isHandlingCorrect]/garmentGripped [currentJoint==0]/firstArmDressed = true /garmentAdquired = true