RangeFinder

motor : Motor
ultraSensor : UltrasonicSensor
targetMotorVelocity : double
lastScan RangeScan
nextScan RangeScan

+ RangeFinder(motor, ultrasonicSensor) : RangeFinder

Instantiates ∞ LinkedListElements

Instantiates 1 UltrasonicSensor

UltrasonicSensor

+ brick : Brick
+ port : uint8

+ UltrasonicSensor(brick, port) : UltrasonicSensor
+ GetDistance() : double

Instantiates 1 Motor

Hardware Interfaces

Controller

PID

integralErrorValues : Queue
integralTimeValues : Queue
derivativeErrorValues : Queue
derivativeTimeValues : Queue
integralErrorSum : double
integralTimeSum : double
derivativeErrorSum : double
derivativeTimeSum : double
proportionalErrorValue : double
lastPEV : double
pGain : double
targetIntegralTime : double
targetDerivativeTime : double

+ PID(pGain, integralTime, derivativeTime) : PID
+ reset() : void
+ updateErrorState(error, elapsedTime) : void
+ calculateControlOutput() : double

Instantiates 2 PIDS

Motor

ANGLE_PID : PID
VELOCITY_PID : PID
brick : Brick
port : string
currentAngle : double
currentVelocity : double
currentAcceleration : double
measurementClock
movementMode uint8
angleTarget double
velocityTarget double

+ Motor(brick, port) : Motor
+ UpdateData() : void
+ ManageSetTargets() : void
+ Stop(brake) : void
+ ClearTargets() : void
+ SetAngleTarget(target) : void
+ SetRelAngleTarget(relTarget) : void
+ SetVelocityTarget(target) : void
+ GetCurrentAngle() : double
+ GetCurrentAngleTarget() : double
+ GetCurrentVelocity() : double
+ GetCurrentVelocityTarget() : double
+ GetCurrentAcceleration() : double

Instantiates 2 motors

DriveTrain

WHEEL_RADIUS : double
TURNING_RADIUS : double
LEFT_VELOCITY_MULTIPLIER : double
RIGHT_VELOCITY_MULTIPLIER : double
TURNING_ERROR_THRESHOLD : double
brick : Brick
leftMotor : Motor
rightMotor : Motor

VelocityToAngularVelocity(velocity) : double
DriveTrainRotationsToWheelRotations(degrees) : double
+ DriveTrain(brick, leftMotorPort, rightMotorPort) : DriveTrain
+ TurnLeft(degreesCounterClockwise) : void
+ TurnRight(degreesClockwise) : void
+ SetForwardVelocity(targetVelocity) : void
+ SetBackwardVelocity(targetVelocity) : void
+ SetMixedMovementTargets(forwardVelocity, angularVelocityCounterClockwise) : void
+ ManageVelocityTargets() : void
+ Stop(brake) : void

Instantiates 1 drivetrain

ManualController

targetForwardVelocity : double
targetAngularVelocity : double
FORWARD_ACCELERATION : double
ANGULAR_ACCELERATION : double

ManualController(keyboard,drivetrain) : ManualController
+ Reset(controller) : void
+ Update(controller) : void

Instantiates 1 keyboard

UserInput

Queue

head : any
tail : any
+ length : uint32

+ Queue() : Queue
+ Enqueue(value) : void
+ Dequeue(value) : any
+ Get(index) : value
+ Set(index, value) : void

Instantiates ∞ LinkedListElements

LinkedListElement

+ value : any
+ next : any

+ LinkedListElement(value) : LinkedListElement

Instantiates ∞ LinkedListElements

LinkedList

head : any
tail : any
+ length : uint32

CheckOutOfRange(index) : void
+ LinkedList() : LinkedList
+ Get(index) : any
+ Set(index, value) : void
+ Append(value) : void
+ Insert(index, value) : void
+ Clear() : void
+ Remove(value) : void

Instantiates 1 LinkedList

Keyboard

keysDown : LinkedList
inputWindow : figure

Keyboard() : Keyboard
+ PressKey(key) : void
+ ReleaseKey(key) : void
+ IsPressed(key) : logical
# delete() : void

Datatypes

Instantiates 3 LinkedList

RangeScanExtremaPoint

+ type : string
+ theta : double
+ distance : double
+ thetaError : double
+ distanceError : double

+ RangeScanExtremaPoint(type, theta1, theta2, distance1, distance2) : RangeScanExtremaPoint

RangeScan

minima : LinkedList
maxima : LinkedList
undefRanges : LinkedList

+ RangeScan() : RangeScan
+ addMinima(theta, distance1, theta2, distance2) : void
+ RangeScanExtremaPoint("min", theta1, theta2, distance1, distance2) : double
+ addMaxima(theta1, distance1, theta2, distance2) : void
+addUndefinedRange(lastDefinedTheta, firstUndefinedTheta, lastUndefinedTheta, nextDefinedTheta) : void
+ RangeScanRange(start, startError, stop, stopError) : double

RangeScanRange

+ start : double
+ stop : double
+ startError : double
+ stopError : double

RangeScanRange(start, startError, stop, stopError) : RangeScanRange

Instantiates ∞ RangeScanExtremaPoints

Instantiates ∞ RangeScanRange