October 17, 2019

**Ishan Patel Nakul Patel** Suyash Yeotikar UID: 116169103 UID: 116334877 UID: 116188456 Map AckermanKinematicModel -mapBounds:Point - wheelBase : double -currCarCoords:Point3f - axleWidth : double -startCoords:Point3f - steeringAngle : double -destinationCoords:Point3f - carVelocity : double -currMapImage:Mat -currCoords:Point3f - carState : Point3f + getWheelBase(): double -SetStartCoordinates(inputCoordinates):returnType bool + getAxleWidth(): double -SetDestinationCoordinates(inputCoordinates):returnType + getSteeringAngle(): double + getCarVelocity(): double -UpdateRobotLocation(inputCoordinates):returnType bool + getCarState(): Point3f -GetRobotCoordinates():returnType Point3f + setWheelBase(double I): bool -InitializeMap():returnType bool + setAxleWidth(double w) : bool -CheckReachedDestination():returnType bool + setSteeringAngleAndCarVelocity(Eigen::Vector2d controllerOutput) : bool -CheckValidCoordinates(): returnType bool + setCarState(Point3f state) : bool -DisplayMapImage():returnType bool + calcAckermanParameters(): Point3f + checkAngleConstraints(): bool **PID** - kp : Eigen::MatrixXd - ki : Eigen::MatrixXd - kd : Eigen::MatrixXd - lastError : Eigen::Vector3d - errorSum : Eigen::Vector3d + getKp(): Eigen::MatrixXd + getKi() : Eigen::MatrixXd + getKd(): Eigen::MatrixXd + setKp(kpIn : Eigen::MatrixXd) : bool + setKi(kiIn : Eigen::MatrixXd) : bool + setKd(kdIn : Eigen::MatrixXd) : bool + getControllerOutput(targetState : Eigen::Vector3d, currentState : Eigen::Vector3d): Eigen::Vector2d + resetErrors(): void