RBE 550 – HW4 Section 6.3: Collision Checker

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*Overview of SAT Collision-Checker*

The collision-checker module uses the **Separating Axis Theorem (SAT)** to test overlap between the vehicle’s oriented bounding box (OBB) and obstacle polygons.  
For each polygon edge, an outward normal defines a projection axis. If any axis yields non-overlapping projection intervals, the polygons are disjoint and the pose is collision-free.  
Figures 1 and 2 illustrate detected and non-detected overlap cases, while Fig. 3 shows the decision flow used in the implementation.

***SAT-based Collision Check pseudo code***

 Function COLLIDES(pose, obstacles):

  veh\_rect ← oriented box for vehicle footprint

  For each obstacle polygon:

   If polygons overlap via Separating Axis Theorem: return True

  return False

***Flowchart***

A diagram of a collision check

AI-generated content may be incorrect.