Software Engineering

CSE870, Spring 2025

Homework 3 Due: February 7, 2025

The Problem:
Pedestrian deaths caused by "collisions" or "Back-overs" often occur while drivers are backing up their vehicles. Most often these accidents occur when passenger cars and trucks are backing out of residential driveways. Many of the pedestrian victims are between 1 and 3 years old (there is another rise as pedestrian ages approach senior level). The distribution of events shows that the pedestrians may be motionless or moving, and in various starting locations as the vehicle is backing up. In all cases, the driver is unaware or is unable to react in time once they become aware of the pedestrian obstacle. The injuries are primarily caused by running over the body with the tire(s) or the body of the vehicle (not the impact).

Desire:
Primary requirement: Prevent injuries
Secondary requirement: Do not irritate the driver with false alarms

Based on information from David Agnew, formerly with Continental Automotive

Assignment:

1. Based on the description above, ***enumerate*** a set of requirements for the system. Be sure that the requirements are "testable". (You may wish to perform a literature review to obtain background information. Be sure to include any sources that you use for this research in the bibliography.)

   Hint: As appropriate, identify assumptions and any hardware and/or platform constraints for your system, especially as they impact your requirements.

2. Identify 3 global invariants of the system. For instance, "Prevent injuries" is a global invariant of the system. (Find 3 other invariants.)

3. Identify 2-3 sources of uncertainty and their respective impacts that might adversely affect the functionality of your system.