The provided code defines a combination of two PID controllers, one for lateral control and the other for longitudinal control. The lateral control is responsible for steering the vehicle towards a target waypoint, and the longitudinal control is responsible for adjusting the throttle and brake to reach a desired speed.

Wobbling issues in a simulated or real vehicle can be caused by various factors, and the PID controllers are potential sources of instability if not tuned properly. Here are some considerations:

PID Tuning: The PID controller parameters (K\_P, K\_I, K\_D) may need to be tuned for both lateral and longitudinal control to ensure stability and smooth performance. The default values in the code are placeholders, and actual tuning might be required based on the dynamics of your vehicle.

Lateral Control: Wobbling during lateral control (steering) could be influenced by the lateral PID controller. You may need to experiment with different values of K\_P, K\_I, and K\_D in the PIDLateralController class to achieve smoother steering responses.

Longitudinal Control: In the PIDLongitudinalController class, the PID parameters (K\_P, K\_I, K\_D) might need adjustment to avoid abrupt changes in acceleration or braking.

Sensor Noise: If your simulation or vehicle model includes sensor noise, it could affect the control system's performance. Ensure that sensor noise is within acceptable limits.

Control Rate: The frequency at which the PID controllers are executed (dt) should match the frequency of your simulation or control loop. Ensure that it is set appropriately.

Vehicle Dynamics: The wobbling issue might also be related to the dynamics of the simulated vehicle. Ensure that the vehicle's mass, inertia, and other physical properties are correctly modeled.

Simulation Environment: Check if there are any specific conditions or scenarios in your simulation environment that trigger the wobbling. It could be related to complex road geometries, intersections, or other factors.

To address the wobbling issue, consider starting with the following steps:

Gradually increase the values of K\_P, K\_I, and K\_D for both lateral and longitudinal controllers, monitoring the vehicle's behavior in a controlled environment.

Experiment with different combinations of PID parameters to find a balance between responsiveness and stability.

Check for any anomalies in the simulation environment that might lead to erratic behavior.

Remember to make small adjustments and test the vehicle's behavior under various scenarios to ensure a robust control system. If the wobbling persists, additional debugging and analysis may be necessary, such as logging sensor data and control outputs for further investigation.