New operation

Kiarash jamshidi

Exploiting video games to testing AV

Look at this picture

First operation

- It affect the lines and the image in the picture

- The fog and rain and wet floor are considered as this type of operation.

- We put some stuff between the road and the camera which modify the picture

operations of first type

Changing the amount of fog

- This operation will modify the amount of fog density.

- This function is categorised as a weather condition operation.

20
km/h

x1000 RPM

Changing the amount of rain

- Same as the fog , it is considered as a weather condition operation .

- In this function, the program changes the number of the drop of rain and get it an outcome.

GDZ-5522

START
STOP

ESC

12
km/h
1
×1000 RPM

ABS

P

D

Add the water into the road

- This operation has two-part, it tries to put water on the road and see the result.

- The first function tries to manipulate the foam density of the water. If the foam rails, the clearness of the water will fall.

- The second function tries to modify the number of ripples in the water. If the number of the ripple raise, the road seems more wavy and unclear to understand.

NEW MODE

26 km/h

Activate Windows
Go to Settings to activate Windows.

x1000 RPM

ENGINE START

ABS

Changing the illumination

- Simulate at different hours of the day.

24
km/h

4
5
6
3
7
2

1000 RPM

ENGINE
START

P

ABS

D

Second type

- It is interrupted the road , make the cut from consistency.

- The the system should tolerance this interrupter for continue the task.

- Adding rocks, adding the object , adding the bumps are considered as this type.

operations of second type

Adding rocks

- This function tries to modify the captured image by the camera sensor. Furthermore, see that the lane-keeping assist is still working or not.

- It tries to implement the grid of a few rocks on the map with a high distance.

- In the modification function, it changes the rock amount to higher and tests the lane-keeping system again.

ESO-5566

ESO-5566

km/h

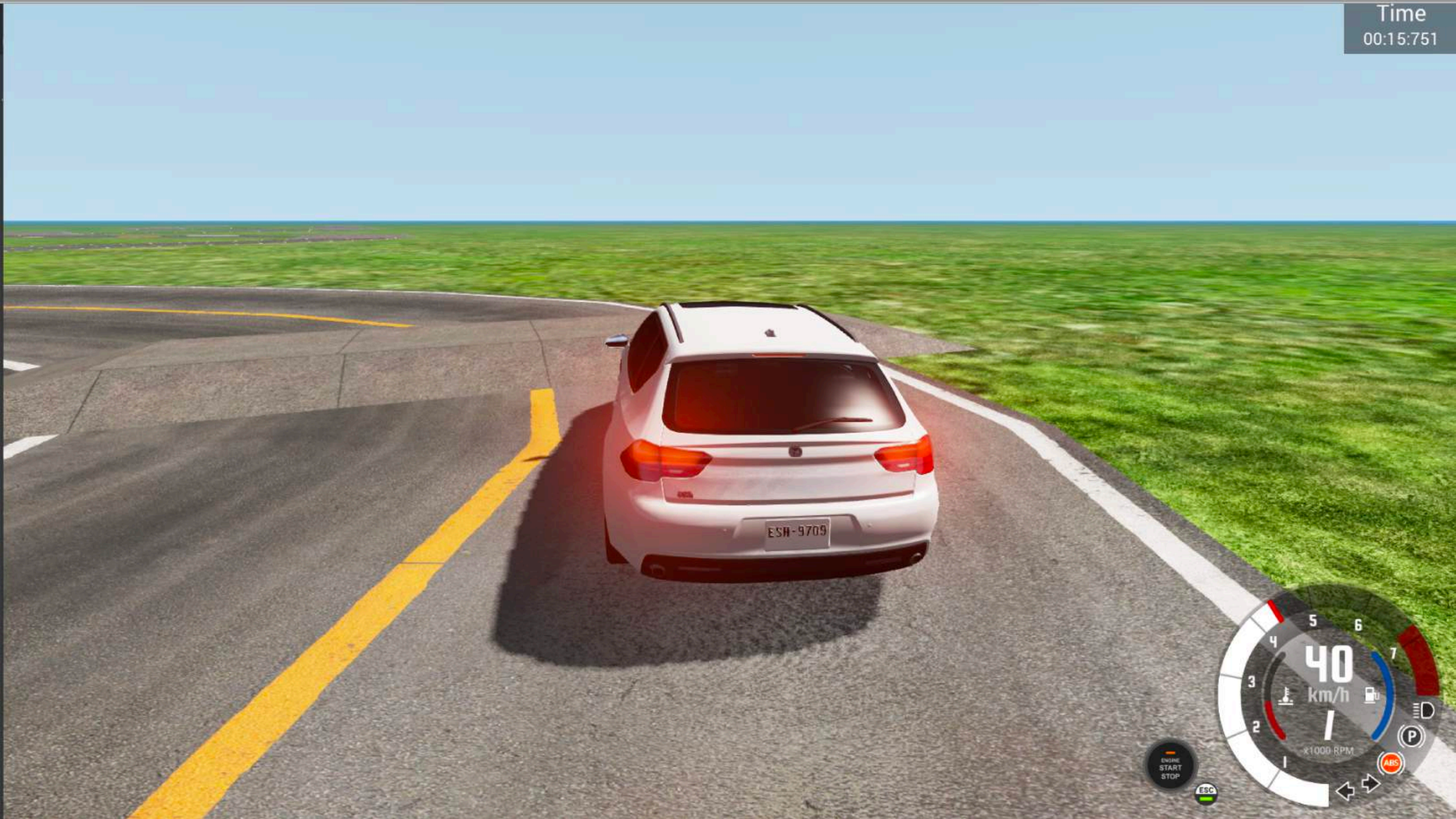×1000 RPM

ENGINE
START
STOP

ABS

ABS

P

Adding bump

- The bump is inevitable in the road. This scenario tries to test the tolerance of the car for the bump in every aspect (height, width, length, upper length, upper width).

- This scenario makes the bump first as the valid one and changes the bump in every index mentioned.

ESH-9709

40
km/h

x1000 RPM

ENGINE
START
STOP

ESC

ABS

Adding obstacle

- This operator is about adding some obstacles to the simulated scenario,e.g., pedestrians or signs. These obstacles may interfere with the lane-keeping feature.

- At first, add the obstacle, and in the second run, it modified the obstacle's position.

- In our example, the obstacle is one cube.

Impact detected, stopping car...

Third operation

- This operation primarily affect the surrounding of the road

- So this type of operation has to avoid the inside of the road modification.

New operations for third type

Signs

- In this operation, I use the sign in the American road .

- This operation randomly choose between the sing and put it in the the left and right side of the road.

- They have same distance form each other

- In the developing of this operation , in the first phase , I tried to put as many as possible to see the more clear outcome.

STOP

GRAV

BUMP

STOP

2

SOUTH

SOUTH

15
km/h

3 4 5 6 7

1000 RPM

ENGINE
START

ABS

P

Trees

- In this operation, we try to put the tall trees in the grid form, which will explain later

- The most critical point in this function is avoiding the trees into the road.

- It captured the left coordinates and right coordinates of the road and put the trees in some coordinate which has More distance from the restriction.
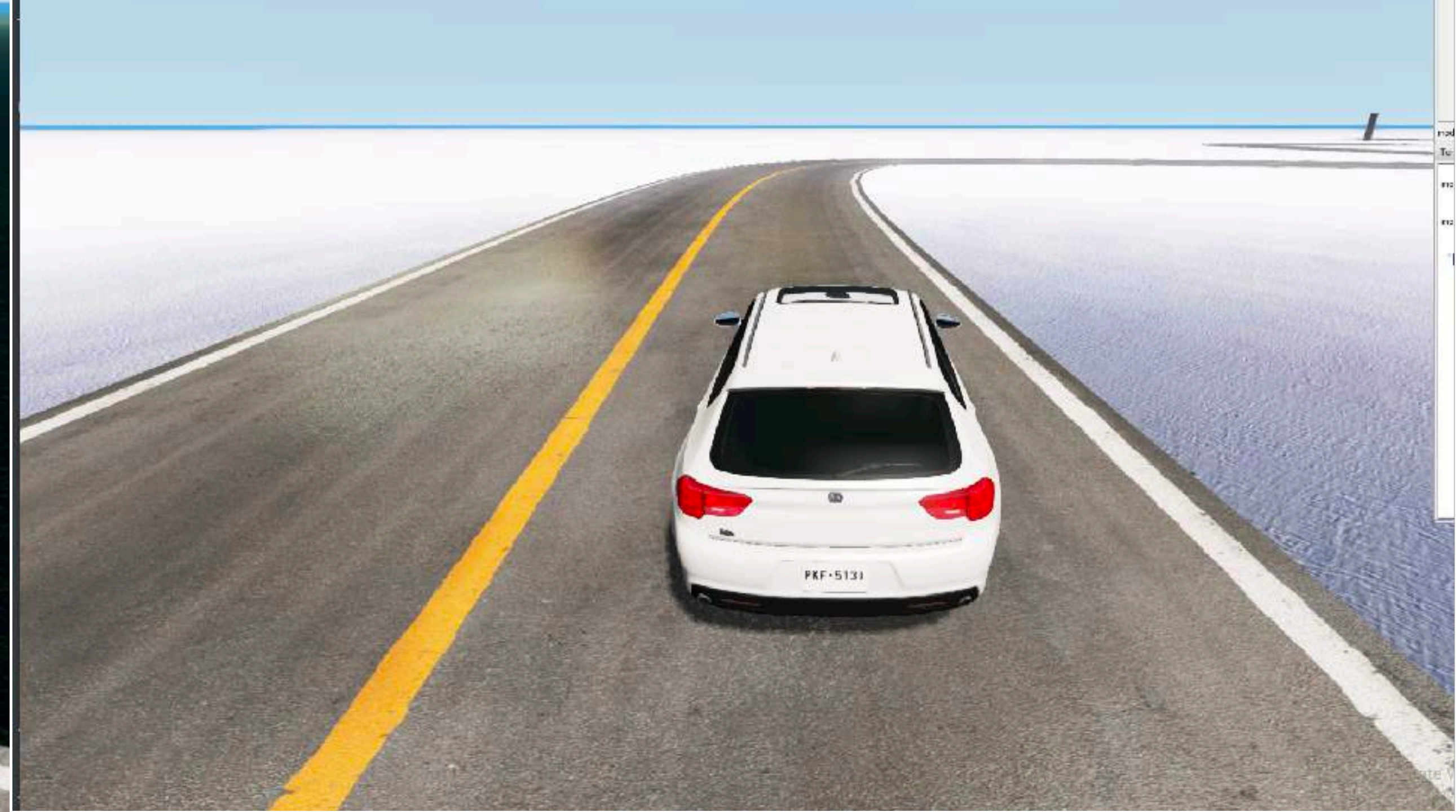
Press ⬚⬚ to resume

IAX - 6978

30
km/h

3
4
5
6
7
2

1000 RPM

Changing the terrain

- In the DeepJanus the sounding is cover in the grass and now it is the time to test the new stuff

- I make some new type of terrain and add it to the level and want to see how the AV and tools by changing it.

New operation

- 1 - adding signs

- 2 - adding the trees

- 3 - changing of the terrain