Unity Sail Boat

Simulate a basic sailboat with 2 sails floating on water around various obstacles, with a view from above on a 2D scene.

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Description

There are 2 sails, a keel and a rudder. The water show via waves the direction and power of the wind. Controls allow to change the tension by which sails are pulled, and the rudder position. Physics simulation uses Unity to handle how wind force over the sails is induced over the boat and affects its movement speed and direction.

Obstacles incluse fixed buoys, and rock wave breakers.

The boat can also throw a small life saver to demonstrate an excercise of pulling a "man in water" situation.

Buttons on the left allow to restrict sail tension control to operate only on one of the sails for doing various types of maneuvers.

Features

1. 2 sails, individually controlled,
2. keel with 3 positions,
3. rudder with 8 positions each side.
4. The boat has a life saver buoy to create "man in water" alerts and maneuvers.
5. Wind power on sails computes both blowing wind and air flow affect over the sails as wings at tight angles.
6. Sails shape reflects the wind blow force applied to them.
7. When wind blows on loose sails, they flicker from side to side to show that.
8. When wind changes sides from the back, sails perform a full side change (revolution) that should be done with care.
9. Rudder is also affecting the boat drag according to its position, so if set to 90 degrees, it will not cause turn, but slow the boat.
10. Colors of sails reflects direction of wind blow side (green when positive, red when negative).

11. Rudder color reflects boat speed forward or backward. When boat velocity is negative, the rudder affects the boat turning in a reverse manner.

Installation

1. Get the project from GIT and use the Unity Editor to run the game.
2. Windows 64-bits: Unzip the installaiton file and run the **Sailing.exe** executable for a full screen experience.
3. Future: APK file for the Android devices.

Usage

The game has GUI controls as well as short-hand keyboard keys to manage the different boat parts when sailing as in the following table:

Part	GUI	Keyboard (for the PC version)
Rudder	Move horizontal slider left and right	Use **left arrow** and **right arrow** keys.
Sail Tension	Move left slider up or down	Use **up arrow** and **down arrow** keys.
Keel position: up, middle or full	Move the 3 position vertical slider on right	Use the **PgUp** and **PgDown** keys.
Sail selection	Two button on bottom left screen allow to select front sail (FS) or main sail (MS) to be affected by the sail tension slider and keys. If both are **not** selected, slider and keys control both sails together.	Use the **W** key for front sail, and **S** key for main sail.
Kick rudder	A blue left and right arrows, perform a sudden kick of the rudder to the left or the right respectfully, when clicked. This can help getting the boat out of stalling when facing wind for instance.	Use the **Left shift** and **Right Shift** keys respectfully.
Man in the water drill	Click the little buoy icon to "throw" a small life saver to mark a man in the water situation. Click on the thrown buoy to grab it back to the boat.	Click the **space** bar to toggle man in the water throw/grab action.
Pause/Play the game	Click the icon to **pause** the game, and then the icon to **resume** it.	Click the **P** key to toggle pause/play modes.
Reset, restart the game	Click the icon to move the boat and screen back to initial state.	Click the **R** key to reset the game.
Help info	Click the icon, to see a keyoard shortcut commands outline image. To close, click the **Close** button on the bottom, or click the icon again.	Click the **?** (usually ? and slash) key for that. Click again to close or hit the **close** button.

Part	GUI	Keyboard (for the PC version)
Zoom in/out	No GUI	Use the **Z** key to toggle between zoom out and in of the scene.
Track option	No GUI	Use the **X** key to toggle between whether camera follows the boat direction, or stays fixed to the north (screen upwards).
Enlarge/Reduce text and icons overlays.	Clicking the green arrows in the button increases size of all GUI elements, clicking the red arrows in the button decreases them.	Use the **+** keyboard (the + and = key, without using shift!) for size increase, and the **-** (minus and underline key) to decrease.
Quit the program	Click the icon, then confirm or cancel	**<CTRL>-C** - hold the control key and click **C**. This too will invoke a confirm dialog.
Toggle full screen	No GUI	**F11** - click the function key F11.

Tracking info

Display on top left showing the vlaues of four parameters dnamically:

1. ANG D. is the Angular Drag which slows boat turning.

2. LIN D. is the linear Drag which slows the boat velocity on all directions.

3. FWD F. is the wind force that is applied on the boat forward direction.

4. LAT F. is the wind force that is applied on the lateral direction.

Contributing

The project is presently private so contributions are limited.

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