

**MATLAB Project:** Space Escape  
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Before running the game please ensure:

You need to change the variable GIF\_LOCATION in m-files "Level2", "MainMenu\_GUI" and "loseGUI" to play the GIF Images located inside.

This game is optimized for a screen of resolution 1366x768 megapixels and aspect ratio of 16:9. You may set desired resolution inside the m-file "screen\_res"

### **Summary:**

The goal of the game is to guide your spaceship out of the space maze towards a certain warp zone as safely as possible. You are faced with certain obstacles and maze boundaries in your way, colliding with which will reduce your shields and eventually obliterate your spaceship. You have limited fuel to reach the end-point. However, the maze is filled with fuel-packs and shield-repairs for your survival however reaching them is often an arduous task.

### **Usage:**

Start the program by running runme.m  
Select New Game and the game will begin from Level 1.

Controls are as follows:

W – Accelerate Forward  
A – Reverse  
S – Rotate Left  
D – Rotate Right  
E – Brake  
Q – Surrender

### **Options:**

Difficulty and duration of gameplay will increase as you progress through levels. Furthermore, you will begin from the beginning once you die. From the Menu Screen, you may select any level you wish to start from.

### **Features:**

An extensive array of audio clips, all of which are your pilot responses other than the background soundtrack. E.g. if you hit the pilot may respond with "mayday mayday", taking a fuel pack would cause him to speak "that extra fuel is got to help" etc.

A complex system of scoring such that you are marked on each "hidden" checkpoint that you reach on every level. Taking powerups (which are often located in difficult scores) and passing levels adds to your score. If you die with a score of less than 20, then you are faced with an insulting message.

Fuel – You are given a warning when fuel equals 20. At fuel=0, your ship drifts off into outer space and you lose. You may take a fuel pack to boost your fuel by 100.

Shields- You start off with two shields. You lose on each, and you die on any consecutive hit unless you take a shield repair upgrade.

Sprite animations for spawning, winning, and teleport.

### **Theory:**

Physics implemented in this game are of gravity-free deep space such that there is no loss of velocity unless you hit something or use your thrusters. Also, sound included in the game are only quotes from pilots since sound from outside the ship such as explosions cannot be heard of due to lack of medium of travel. You can slingshot around stars which drastically increases your velocity and is usually fatal. Shields are your only source of protection against these rocky environment otherwise your ship is virtually defenseless.

### **Programming:**

#### **Unusual Features:**

Sprite feature (a series of images running at dozens of frames per second) have been used to create realistic animations.

Also, GIF Images have been used using an in-figure java-based browser control. This saves from the need of using Sprites for animations.

#### **Structures:**

The main program is started by runme.m

The function makeSpaceShip is used to create the ship (essentially a triangular polygon) and its two shields are made by plotting a circle using the plot command.

The function ShipNav is the most critical part of the program. It navigates the movement of the ship on screen which is a summation of the Ship's Linear and Angular Velocity. Both the velocities have an acceleration component such that they increase by a factor, and not just linearly depending on how long the Key is pressed.

KeyPressFcn and KeyReleaseFcn keep a track of precisely when the control keys are pressed/released which is critical for the acceleration of ship, both angularly and linearly.

Cell Arrays have been used to store handles of the different Audio Clips. This allows convenient use of an audio file at any point in the game. Furthermore the "randi" function enables the use of random sound effects out of several different clips adding to a very diverse set of responses from the ship pilot.

### **Other:**

If you really want to challenge yourself, try playing without using brakes!