

# **Software Test Plan**

for

## **Structural Health and Rupture Detection (SHARD)**

Version 1.0

Prepared by Julian Herrera and Matthew Manley

Florida Institute of Technology

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# Table of Contents

Table of Contents	2
1 Introduction/Purpose	3
2 Revision History	3
3 Test Cases	4
3.1 TC001	4
3.2 TC002	4
3.3 TC003	5
3.4 TC004	5
3.5 TC005	6
3.6 TC006	6
3.7 TC007	7
3.8 TC008	7
3.9 TC009	8
3.10 TC010	8
3.11 TC011	9
3.12 TC012	9

# 1 Introduction/Purpose

The purpose of this document is to provide documentation for various test cases that could occur within the system of the Structural Health and Rupture Detection project (SHARD).

# 2 Revision History

Revision Number	Description	Date
1.0	Initial revision	10/5/2022

## 3 Test Cases

### 3.1 TC001

Code	TC001
Description	Create model
Preconditions	N/A
Procedure	Click on “New Model” button and ensure the program generates a new shield model
Valid Input	User clicks new model at the top of the screen
Invalid Input	N/A
Expected Output	Program closes the current model and generates a blank new model

### 3.2 TC002

Code	TC002
Description	Open file
Preconditions	File Exists
Procedure	Click on “Open File” button and ensure the program loads and opens the pre-existing file
Valid Input	User clicks on desired file
Invalid Input	N/A
Expected Output	Program closes the current model and opens the clicked-on file

### 3.3 TC003

Code	TC003
Description	Save model to file
Preconditions	N/A
Procedure	Click on the “Save Model” button. Reopen the application and see if the model was saved to the file
Valid Input	User clicks the “Save Model” button
Invalid Input	N/A
Expected Output	Program saves the model so that the model remains on the file upon closing and reopening the application

### 3.4 TC004

Code	TC004
Description	Rotate model
Preconditions	Rotation mode is activated
Procedure	While in rotation mode, rotate the model in the desired direction using the three-dimensional axis. Ensure that the model can be viewed from all three dimensions
Valid Input	User clicks on curved arrow to rotate the model along the z-axis
Invalid Input	N/A
Expected Output	The model is rotated in the z direction

### 3.5 TC005

Code	TC005
Description	Rotate camera
Preconditions	Control button is held
Procedure	While the control button is pressed, drag the mouse back and forth across the screen. Ensure that the camera angle changes in relation to the mouse movement
Valid Input	User holds the control button and drags the mouse to the left
Invalid Input	N/A
Expected Output	The camera is moved and a different angle of the model is portrayed

### 3.6 TC006

Code	TC006
Description	Translate model
Preconditions	Rotation mode is activated
Procedure	While in rotation mode, click on axis arrows to move the model along a specific axis. Ensure that the model moves in the corresponding direction.
Valid Input	User clicks on the y-axis arrow
Invalid Input	N/A
Expected Output	The model moves to the right along the y-axis

### 3.7 TC007

Code	TC007
Description	Translate camera
Preconditions	N/A
Procedure	Use the WASD keys to move the camera horizontally or vertically. Ensure that the camera is moved in the correct direction
Valid Input	User presses and holds the “a” key
Invalid Input	N/A
Expected Output	The camera is moved horizontally to the left

### 3.8 TC008

Code	TC008
Description	Scale model
Preconditions	N/A
Procedure	Click on the “Edit Size” button and enter the new shield tile length. Ensure that all tiles are enlarged equally in the model
Valid Input	User enters 10 inches as the new tile length from the original 3 inches
Invalid Input	User enters a non-numeric character
Expected Output	All shields grow equally to scale

### 3.9 TC009

Code	TC009
Description	Add a tile
Preconditions	Edit mode is activated
Procedure	While in edit mode, click twice on any side of the shield tile. Ensure that a new tile is created adjacent to that side.
Valid Input	User clicks twice on the left side of the a shield tile
Invalid Input	N/A
Expected Output	A shield tile is generated along that selected side

### 3.10 TC010

Code	TC010
Description	Remove a tile
Preconditions	Edit mode is activated
Procedure	While in edit mode, right click on the desired tile. Click the “delete tile” button. Ensure that the tile is removed from the model.
Valid Input	User right clicks on a tile and clicks “delete tile”
Invalid Input	N/A
Expected Output	The shield tile is deleted



### 3.11 TC011

Code	TC011
Description	Connect sensor/multiplexer/Raspberry Pi usb to laptop
Preconditions	N/A
Procedure	Connect the sensor's electrical data as inputs to a multiplexer. Connect the multiplexor's single output to the Raspberry Pi which connects to the computer. Simulate the sensors and ensure that computer reads the correct information
Valid Input	Activate tile two's sensor
Invalid Input	N/A
Expected Output	Computer reads the data and understands that tile two is being activated

### 3.12 TC012

Code	TC012
Description	Simulate using projectile events
Preconditions	Model exists
Procedure	Create a projectile event by entering in meteoroid speed, angle, and location.
Valid Input	User enters in meteoroid velocity, density, starting position, and time of collision
Invalid Input	User enters in non-numeric data
Expected Output	Simulation shows projectile event three-dimensionally and whether or not the collision created a dent or rupture