The MATLAB$^{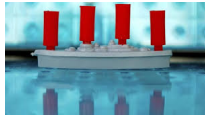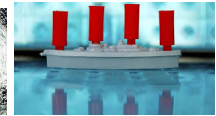TM}$ Challenge is an effort to spur interest in programming among USI Engineering students. This challenge is available to all USI Engineering students.

# Battleship!

# 1   Introduction

"The game of Battleship is thought to have its origins in the French game L'Attaque played during World War I, although parallels have also been drawn to E. I. Horseman's 1890 game Baslinda, and the game is said to have been played by Russian officers before World War I. The first commercial version of the game was Salvo, published in 1931 in the United States by the Starex company. Other versions of the game were printed in the 1930s and 1940s, including the Strathmore Company's Combat: The Battleship Game, Milton Bradley's Broadsides: A Game of Naval Strategy and Maurice L. Freedman's Warfare Naval Combat. Strategy Games Co produced a version called Wings which pictured planes flying over the Los Angeles Coliseum. All of these early editions of the game consisted of pre-printed pads of paper.

Battleship was one of the earliest games to be produced as a computer game, with a version being released for the Z80 Compucolor in 1979. Many computer editions of the game have been produced since. In Clubhouse Games for the Nintendo DS, Battleship is known as Grid Attack. It is played on an 8x8 grid, and includes slight variations, such as 4-player gameplay, various ship sizes and shapes, as well as the option to make the ships touch each other. Iterations of Battleship appear as applications on numerous social networking services."[1]

# 2   Battleship Game Play

Battleship is a game that requires two players:

- YOURSELF and
- A CHALLENGER

The goal of the game is to "sink" the challenger's entire Navy before s/he does the same to yours. You and the challenger are allocated a Navy that consists of 5 ships:

- One Aircraft carrier (5 units in length)
- One Battleship (4 units in length)
- One Cruiser (3 units in length)
- One Submarine (3 units in length) and
- One Destroyer (2 units in length)

The game begins with yourself and the challenger arranging each of the 5 ships of the respective navy on an ocean grid that is 10 units (A-J) by 10 units (1-10). None of the ships can overlap one another on the grid (not even the submarine). Once the ships have been positioned, a random selection determines who has the opportunity to fire first. Each turn consists of both the challenger and yourself taking a turn to fire at each other's Navy. A "shot" is announced by declaring a grid location (e.g. "A5"). You and the challenger trade shots until one or the other hits all grid units on which a ship sits. Once a ship has been hit on all grid units the respective player declares to the other players ship has been "sunk". For example if the battleship has been disabled - the player must declare,"You sunk my battleship, " or for a submarine - the player would declare, "You sunk my submarine." Play continues until one of the players's Navy is completely sunk.

More details can be located here: http://www.battleshiponline.org/how-to-play-battleship.php

# 3   The Challenge

Write a MATLAB$^{TM}$ script to allow a user to play Battleship against a computer.
Your program must

1. randomly select position of each ship on the challenger's ocean grid,

2. allow the player to place each of the required ships on the ocean grid,
3. show all of the player's and challenger's hits and misses visually (color and location) on an ocean grid&
4. include an **intelligent strategy** behind the "CHALLENGER'S" firing attempts (i.e. no-random selection).

# 4 Challenge Rules

## 4.1 General Rules

1. Write your own code.
   (a) Your code must be original; All of your work must be your own!
   (b) You are encouraged to use subroutines where & when appropriate.
2. Please comment your code.
   (a) You must include your last and first name as the first commented line in your main code.
   (b) You must add comments to your code to describe the operation of different sections.
   (c) If your code is not understandable or easy to follow, you may forfeit your entry.
   (d) I strongly encourage you to include a flow chart with your submission.
3. Team entries are valid (all names must be included in submitted code), however, only one prize may be awarded.
4. "Elegance of code" will decide tie-breakers.

## 4.2 Submission Instructions

### 4.2.1 Submission Method

1. Matlab code and required subroutines must be zipped into a single file.
2. Please use the file name structure: "LastName_FirstName_Year_Month_Day_MatlabChallenge03.zip"
   For example, my submission would be: "Davis_Julian_2016_01_16_MatlabChallenge03.zip"
3. E-mail the zipped file to Dr. Davis (jldavis2@usi.edu).
4. The E-mail subject line must include the text: "Matlab Challenge 03"

### 4.2.2 Resubmissions

1. There must be at least 15 calendar days between submissions.
2. You may re/submit as a team OR an individual - NOT BOTH.

## 4.3 Matlab Challenge Evaluation will begin:

The closing date for this MATLAB Challenge is:

# April 30, 2018!!!

## 4.4 The Prize!

# Matlab paraphernalia of your choice!

# 5 References

[1] https://en.wikipedia.org/wiki/Battleship_(game)
[2] https://en.wikipedia.org/wiki/Hull_classification_symbol