



Battleships

Praktikum: Sichere Softwareentwicklung für Mikrocontroller (in vernetzten Energiesystemen)

Stefan Gapp, Steffen Gufler, Joachim Müssig



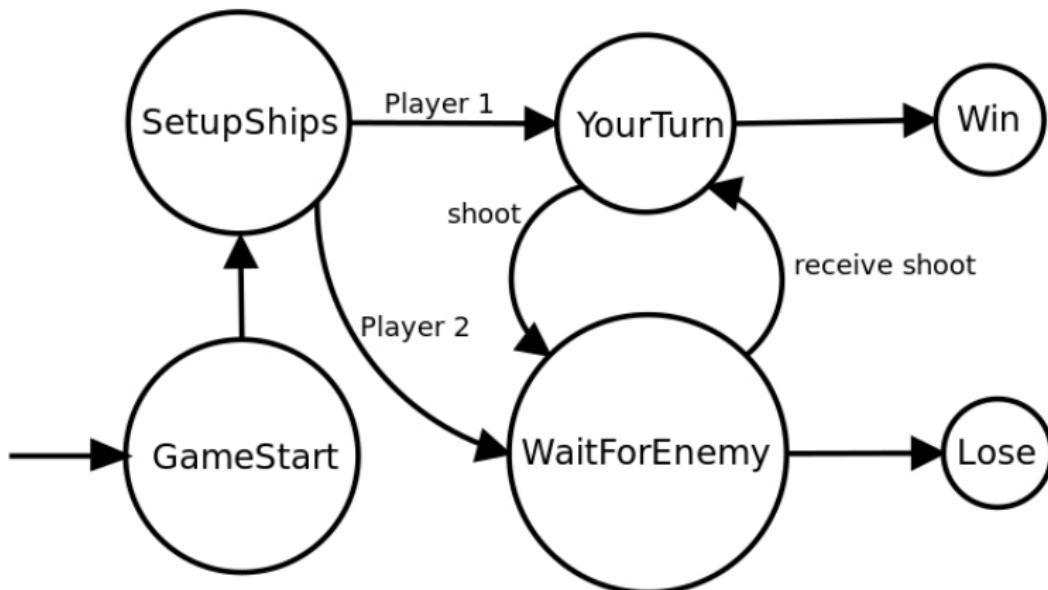
Game



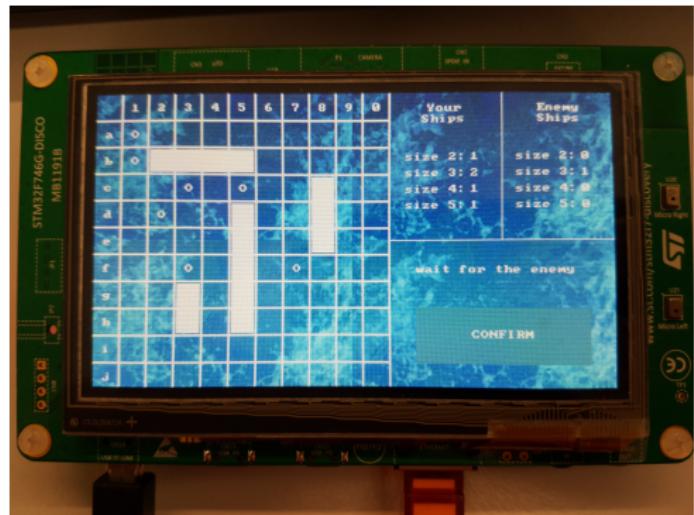
- Well-known Battleships pen and paper game
- For 2 players
- Microcontrollers communicate over LAN
- State-based game
- Ships:
 - 1 of length 5
 - 1 of length 4
 - 2 of length 3
 - 1 of length 2



Game States



Gameboard



```
pub struct Board {  
    ships: Vec<Ship>,  
    fields_shot: [[bool; 10]; 10],  
    setup_field: [[bool; 10]; 10],  
    placed_ships: [[bool; 10]; 10],  
    pub enemy_ships_hit: [[bool; 10]; 10],  
    remaining_enemy_ships: [u8; 4],  
    pub enemy_fields_shot: [[bool; 10]; 10],  
}
```



Network



```
#[derive(Debug, Copy, Clone)]
pub struct ShootPacket {
    pub line: u8,
    pub column: u8,
}

#[derive(Debug, Copy, Clone)]
pub struct FeedbackPacket {
    pub hit: bool,
    pub sunk: u8,
    pub you_win: bool,
}

#[derive(Debug, Copy, Clone)]
pub struct WhoamiPacket {
    pub is_server: bool,
}

pub trait Serializable {
    fn serialize(&self) -> Vec<u8>;
    fn deserialize(input: &[u8]) -> Self;
    fn len() -> usize;
}
```



Problems



- Network
- Network debugging
- Images
- Interfaces
- touch response time
- VS-Code Memory leaks
- distraction (energy clicker group ;P)



Demo



The End



Thank you for your attention!

