

# TankCraft

Yang Liu & Frost Xu

CS207 Course Project: TankCraft

Full-Directional Tank Shooter Video Game for Dual Players

# Game Features

- Two players game: human vs human
- Player can forward, backward or rotate the tank
- Five possible maps (file)+ 1 random map
- Dynamic visible area
- Four HP, two-second CD
- Realistic physics engine

# Game Features: Menu

## Menu

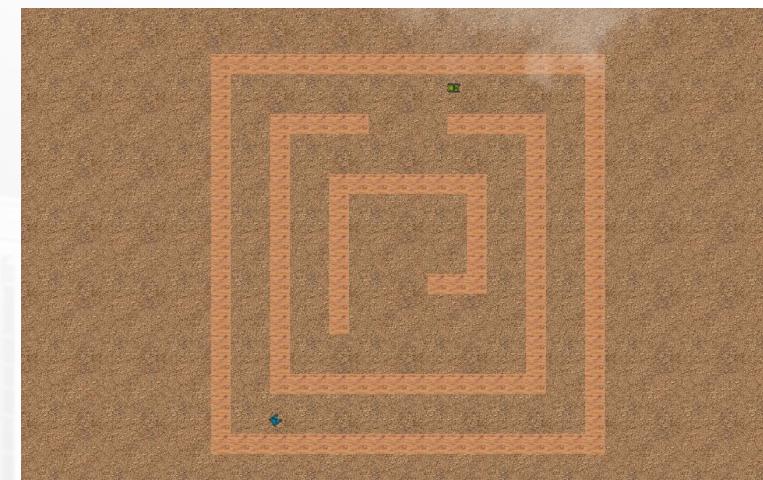
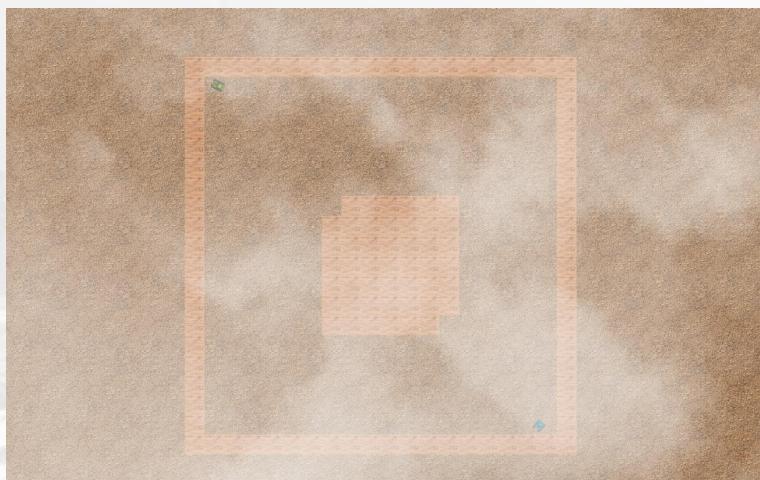
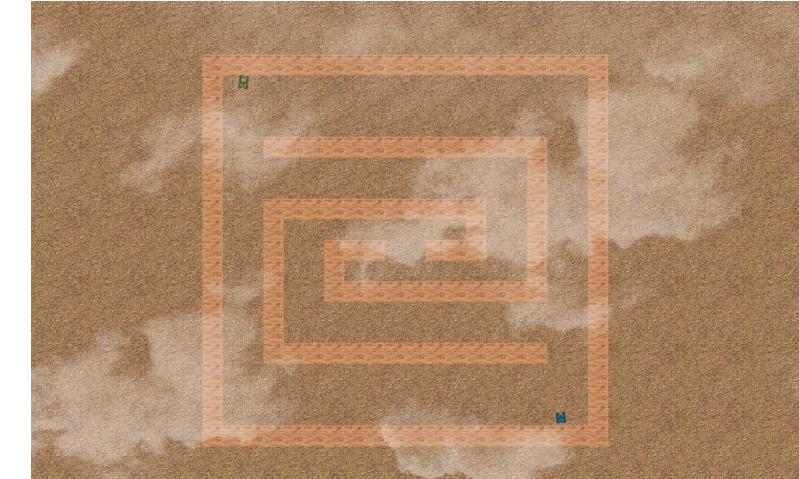
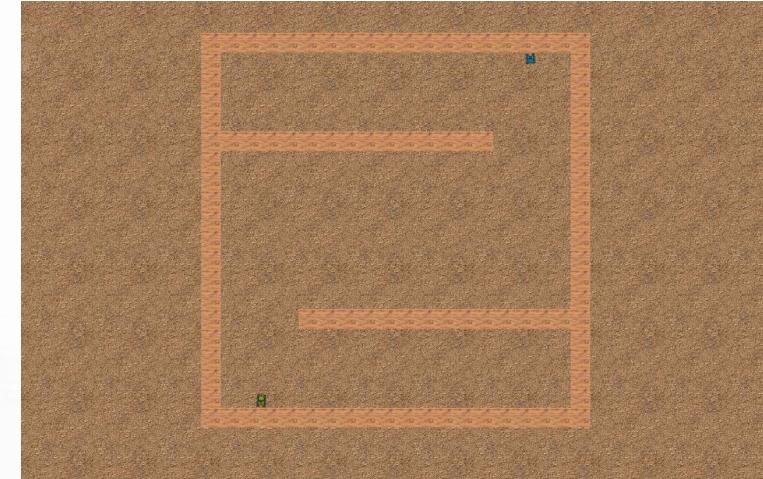
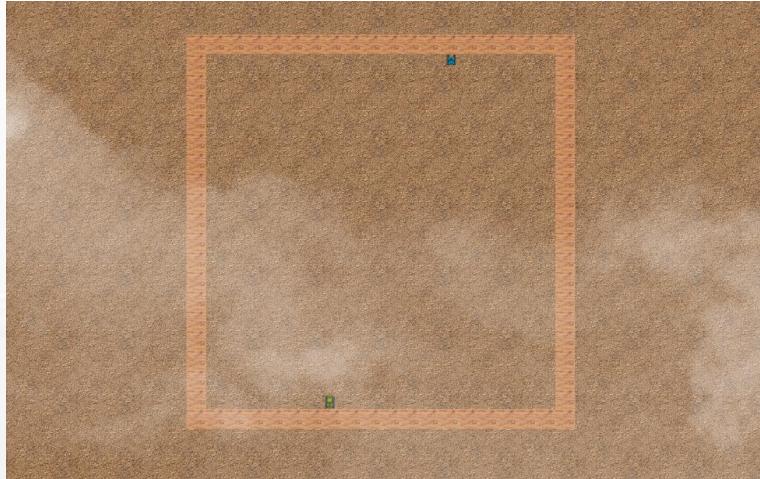
- Play — Initialize World and Start
- Join — Join a Host, no done
- More — Jump to game source code
- Help — Jump to game report
- Exit — Exit if confirmed



# Game Features: Player Instruction



# Game Features: Maps



# Game Features: HP & CD

## HP:

- Both of tanks has 4 HP
- When hit, the sounds effects are different for different HP
- Can check it by <TAB>

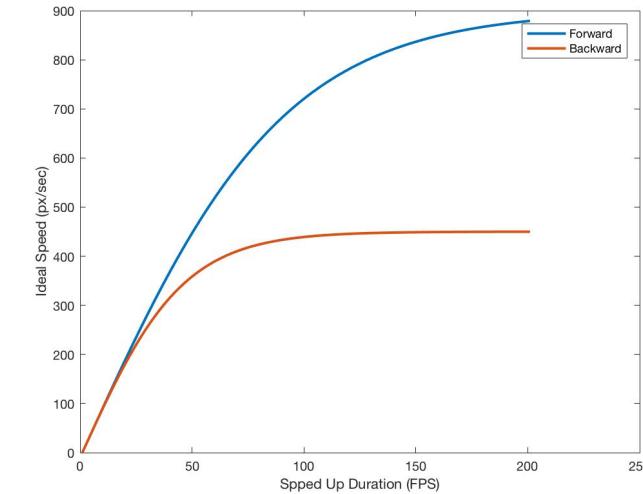
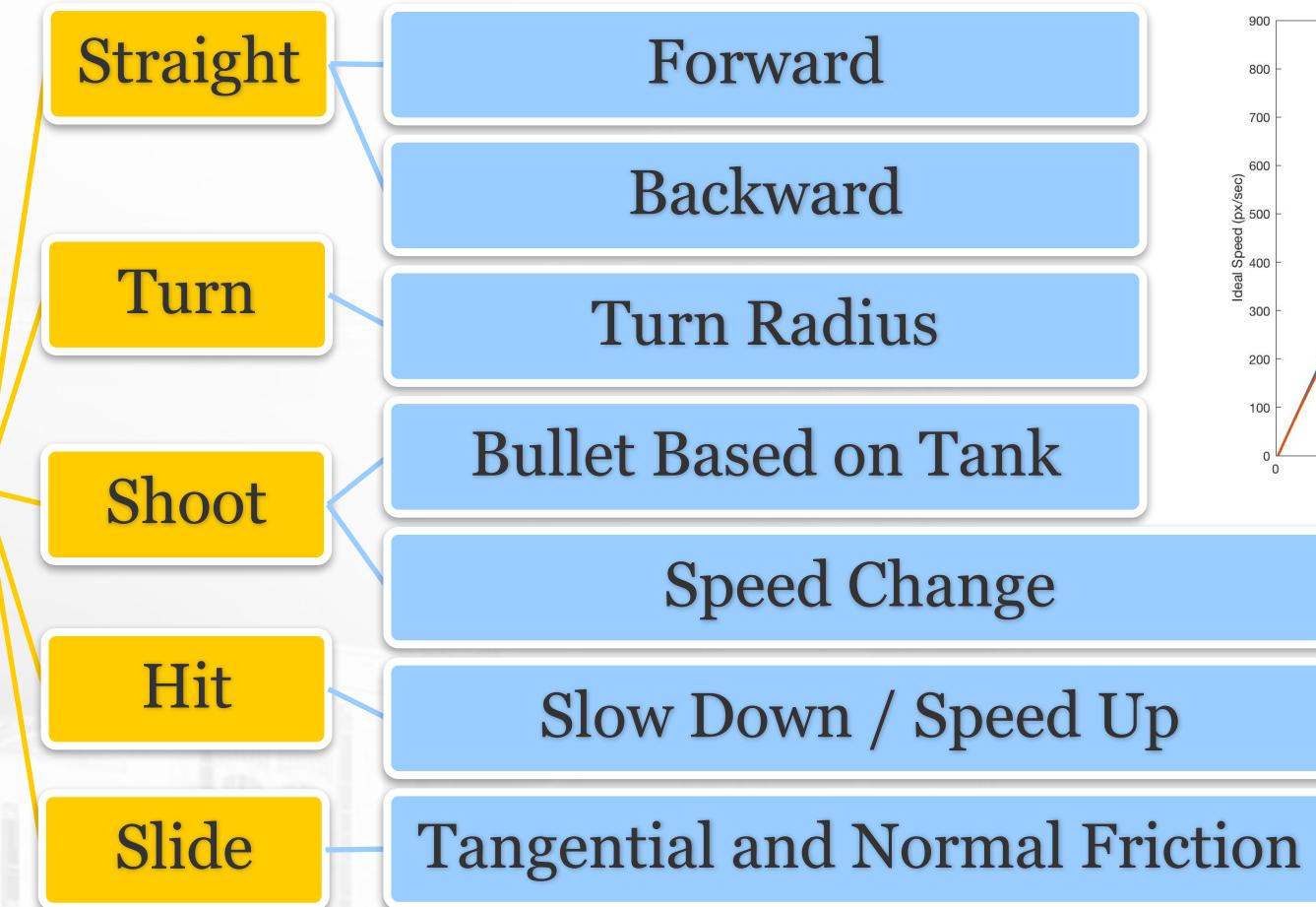


## CD:

- Cool Down is introduced to make the game realistic
- Tank bullet CD is one second
- Once hit, the tank will be invulnerable in two seconds.

# Game Features: Physics Engine

Drive  
Simulation



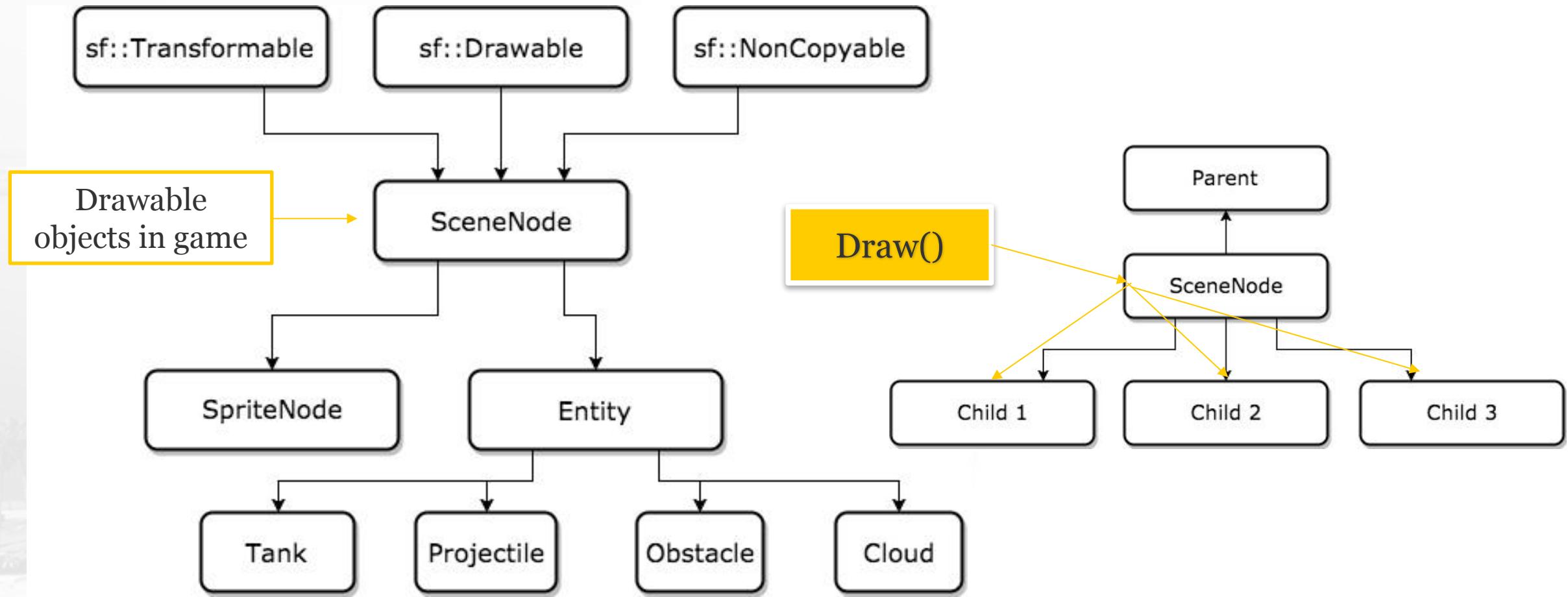
$$\alpha = 0.05 \text{px}(\text{FPS})^2$$

$$\dot{v} = -\alpha v$$

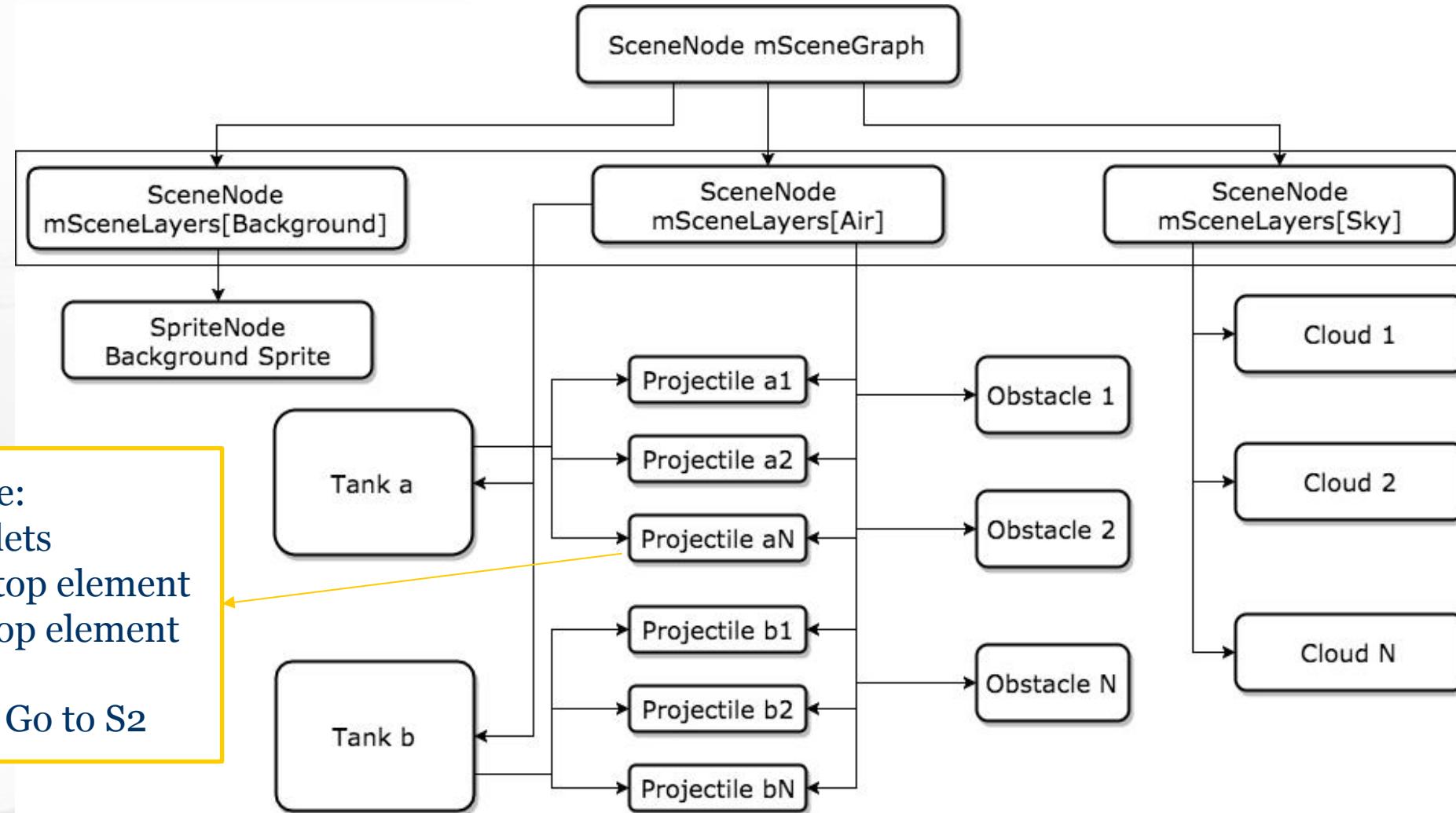
# Main Classes & Data Structure

- Scene Node: World Control
- State Stack: Diverting the Game Flow
- Button: Graphics User Interface
- Command: Real Time Respond
- World

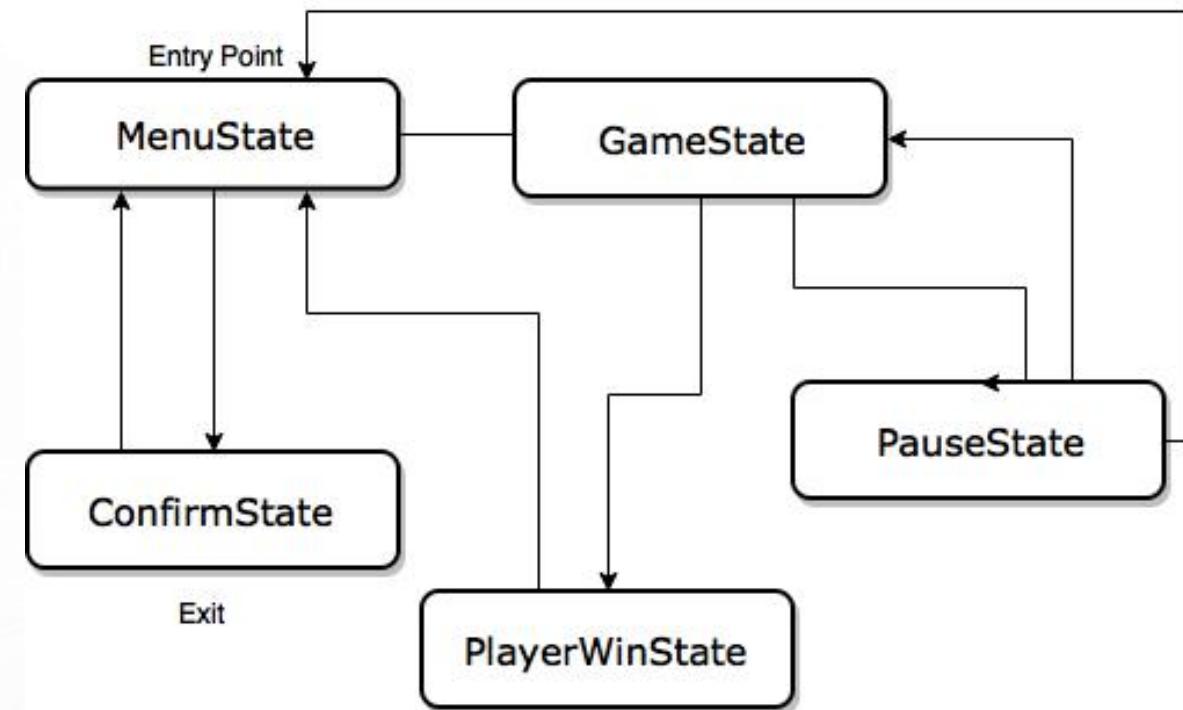
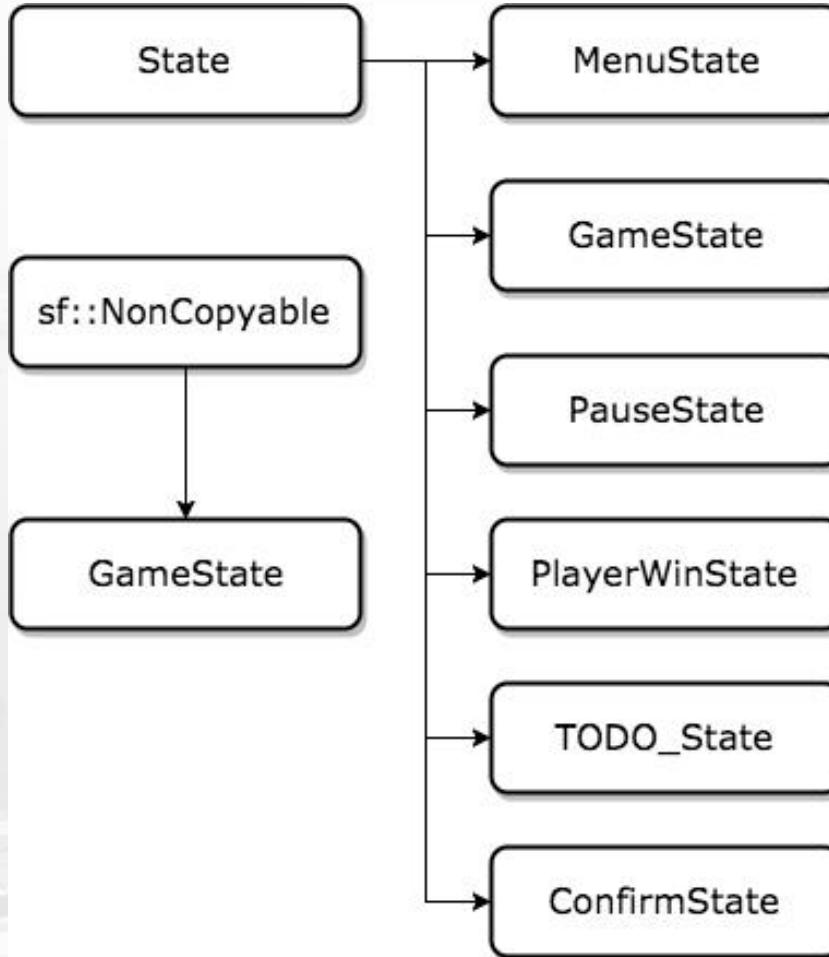
# Main Classes: Scene Node



# State Stack: Scene Node



# State Stack



# State Stack

From GameState,  
Escape:

```
>StateStack.push(PauseState);
```

At PauseState,

1. Escape:

```
>StateStack.pop();
```

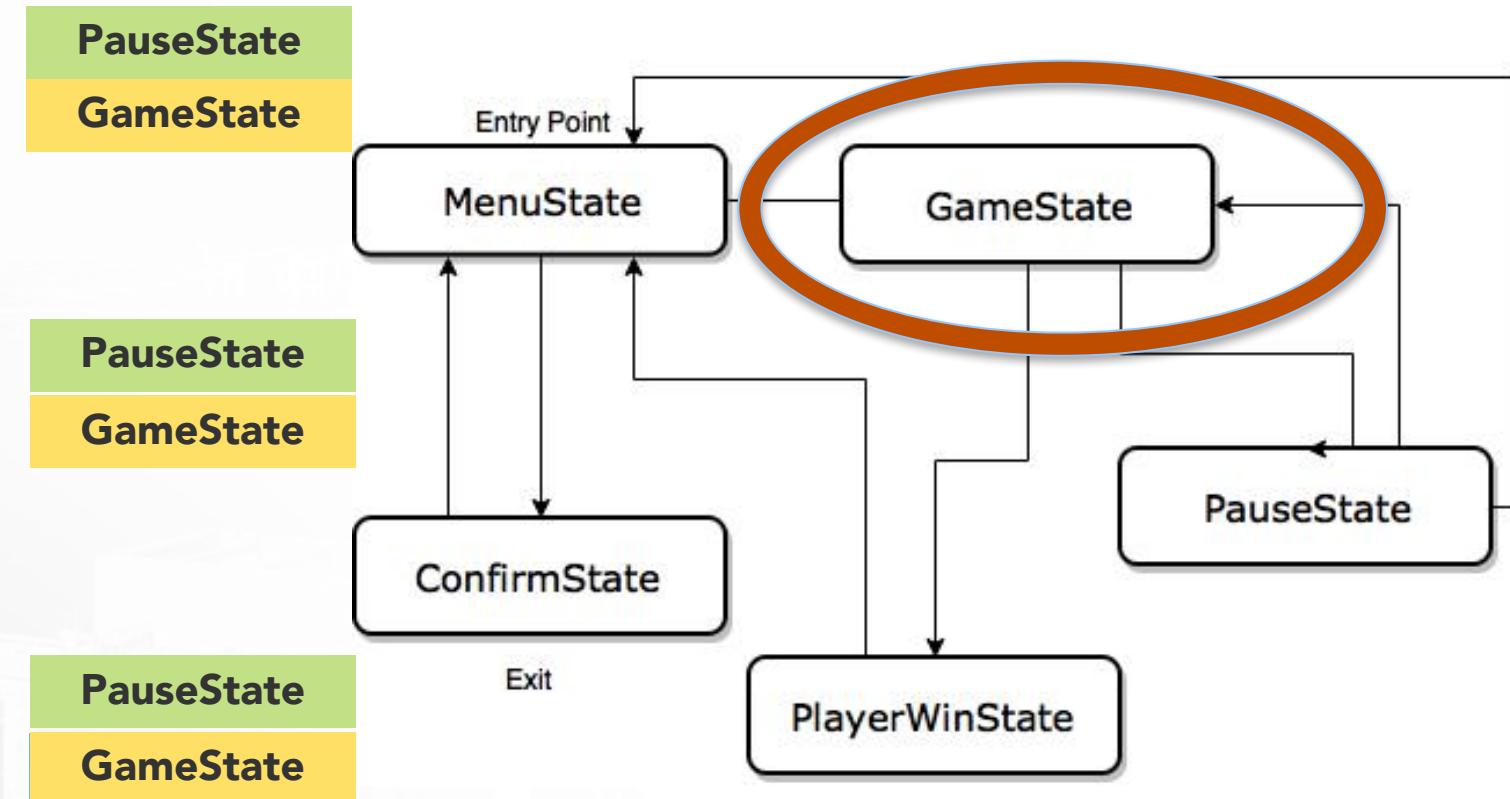
game resumes

2. Back:

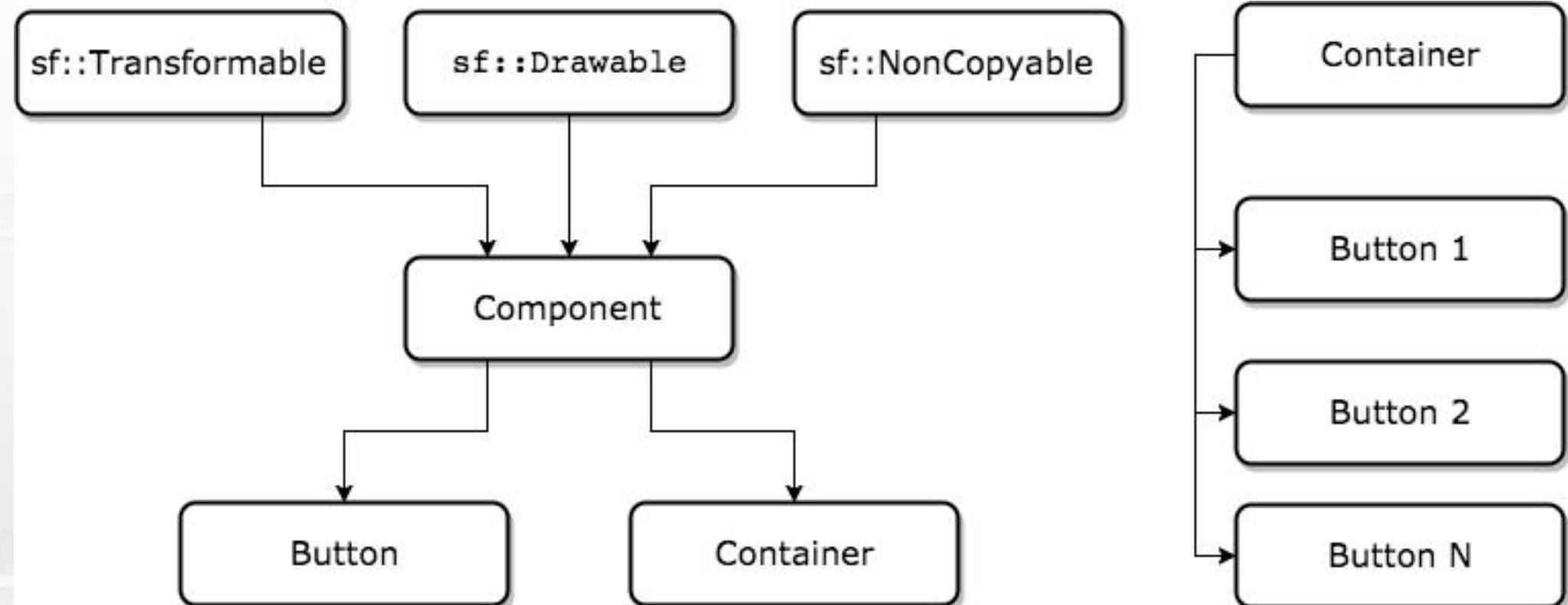
```
>StateStack.clear();
```

```
>StateStack.push(MenuState);
```

return to main menu.



# Button



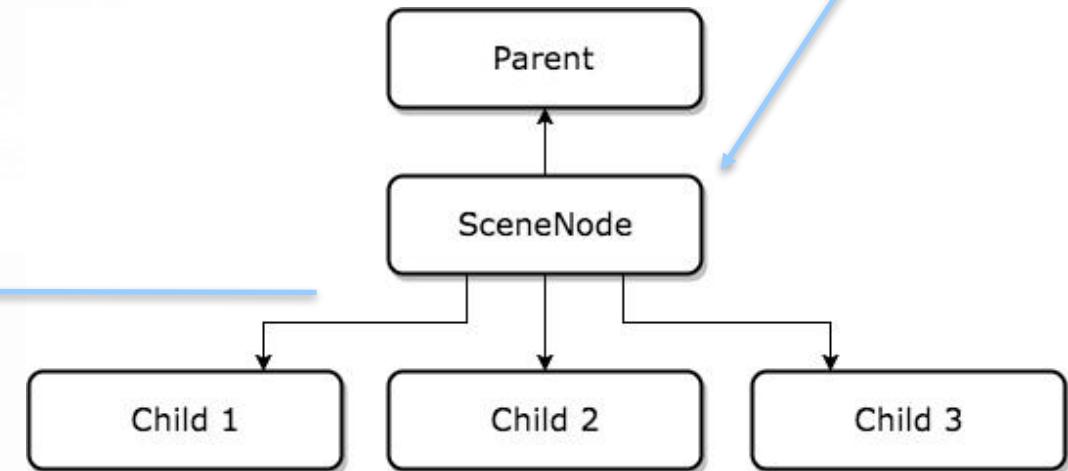
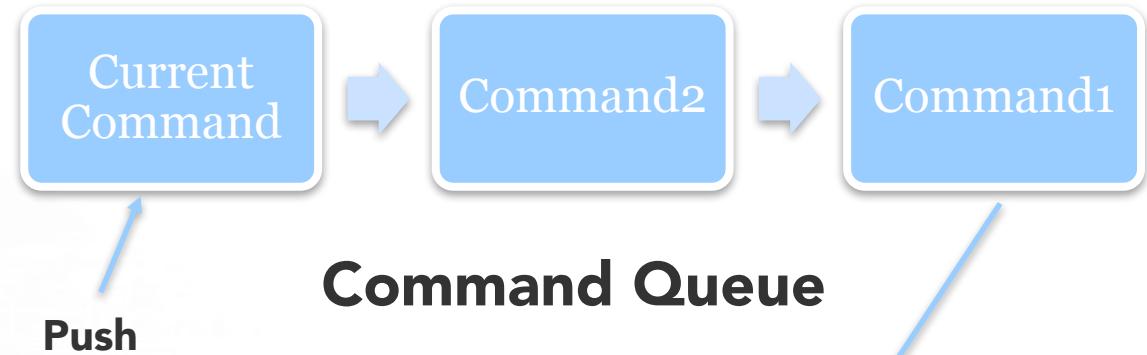
# Command

## Class Player



```
std::map<sf::Keyboard::Key, Action> mKeyBinding;
```

```
enum Category{  
    Cdefault,  
    CBackGround,  
    CBackgroundLayer,  
    CAirLayer,  
    CTank,  
    CBullet,  
    CSky,  
    CCloud,  
    CObstacle,  
    Cother,  
    Croot  
};
```



# Demo: World Class

- Initialize
  - Build Scene
  - Add Entities
- Draw
  - Move View Port
  - Draw Scene Node Tree
  - \* Show Information
- Update
  - Pop Command
  - Update View
  - Collisions
  - Scene Node Tree
  - Update Information
- Reset

Demo

# Q & A

- Yang Liu
  - ID:158217
  - E-mail: [Yang.Liu.3@kaust.edu.sa](mailto:Yang.Liu.3@kaust.edu.sa)
- Frost Xu
  - ID:157223
  - E-mail: [Mengmeng.Xu@kaust.edu.sa](mailto:Mengmeng.Xu@kaust.edu.sa)

