

Research, Code, Create –  
An Introduction to the Game  
School at Inland Norway  
University



Meisam Taheri (多縁明彩夢)  
Associate Professor



# BACKGROUND

- **Masters of software engineering :**
  - Researching problem solving in programming, difficulties in teaching and learning programming, and how intelligent tools and social networks can be effective in problem solving and coding.
- **PhD in robotics :**
  - Optimizing Flexible Transfer Line (FTL), Flexible Manufacturing System (FMS), and Automatic Guided Vehicles (AGV) using Genetic Algorithms using C/C++
  - Driver Behavior Analysis Based on a Head-mounted VR Driving Simulator (serious game simulation)
- **Azapa, Tokyo R&D, Japan:**
  - Robofrok : CAN network programming using C++
  - IOS Development: Designing and developing an IOS app for a Voice Emotion detection service
  - Driving simulator ( project leader) : Python, C++ and Matlab Simulink developments
  - IoT : IoT devices programming using ESP8266, Arduino and raspberry Pi.



# ASSOCIATE PROFESSOR, GAMESCHOOL , INLAND NORWAY UNIVERSITY

## Teaching subjects

- Programming 1 (C++)
- Programming 2 (C++ / Unreal Engine 5)
- Data structures and algorithms (C++)
- 3D Game Engine (OpenGL C++)
- Game Engine Architecture
- Game Design
- Unity3D Game Engine
- Python 1&2 (BA of AI)



# RESEARCH ACTIVITIES

- Enhancing Presentation Skills: A Virtual Reality-Based Simulator with Integrated Generative AI for Dynamic Pitch Presentations and Interviews.  
Taheri, Meisam; Tan, Tiow Wee. 2024, xr salento 2024. HINNVitenskapelig foredrag
- Developing a Serious Game for Acute Pain Detection by utilizing Virtual Reality and Brain-Computer Interfaces .  
Taheri, Seyyed Meisam; Tan, Tiow Wee. 2024, Lecture Notes in Networks and Systems.  
HINNVitenskapelig artikkel
- A behavior analysis tool using pitch presentation training virtual reality simulation by employing brain computer interface technology .  
Taheri, Meisam; Tan, Kevin; Aske, Adam Emile. 2023, ICERI Proceedings. HINNVitenskapelig artikkel
- Detecting acute pain using Machine learning and Brain Computer interface.  
Taheri, Seyyed Meisam. 2023, SANORD 2023. HINNVitenskapelig foredrag
- A study of how Virtual Reality and Brain Computer Interface can manipulate the brain.  
Taheri, Seyyed meisam; Kalnikaite, Diana. 2022, Association for Computing Machinery (ACM).  
HINNVitenskapelig Kapittel/Artikkel/Konferanseartikkel



# CURRENT PROJECTS AND RESEARCH

A Virtual Reality-Based Dialogue Simulator with Integrated Generative AI

Detecting bullying in multiplayer games using LLMs (VR, AI and unity3D)

A Virtual Reality Serious Game Simulation Assisting Children Living with Cancer

Development and evaluation of an interview simulator for assisting unemployed young adults to enter the workforce



# PITCH AND DIALOGUE SIMULATOR





04.7%

The difficulty Level for current trainee is :

EASY



### Intruder

The ship crash lands on a new planet. The people on it end up being hunted by the aliens that already inhabit the planet and have to hide and camouflage themselves in order to survive and escape.

#### Selling points

- Scary alien planet with fungi-inspired enemies
- Adapt your playstyle in order to make progress
- Use the environment to disguise yourself to stay hidden from the enemies
- Environmental puzzles and platforming
- Platformer game where the visuals are a mix of 3D and 2D elements



INN



RESET SIM

START SCENARIO

EXIT SIM

SPECIAL RESPONSE



### Nils' Actions

Distracted/Bored

Intrested and focused

### Christine's Actions

Distracted/Bored

Intrested and focused

### Adam's Actions

Distracted/Bored

Intrested and focused

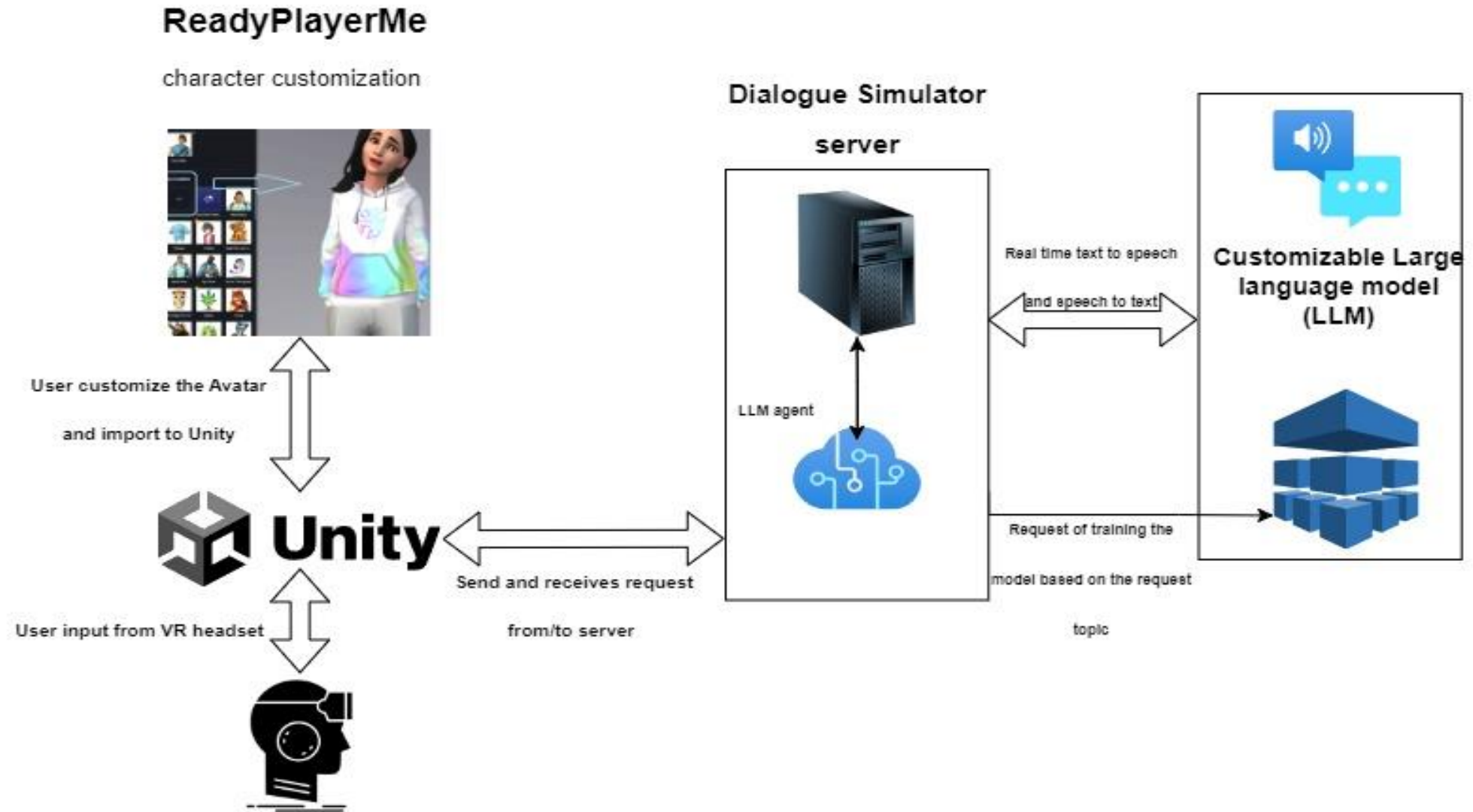
### Tina's Actions

Distracted/Bored

Intrested and focused



# USING AI FOR TEACHING EDUCATION





# ABOUT GAME SCHOOL



- Established in 2003
- Part of the faculty Film, TV and Game Development together with the Norwegian Film School & the TV-School
- Approx. 350 students
- 32 full time staff
- Part of Scandinavia's largest game development community in the City of Hamar
- Focus areas:
  - VR / AR / XR
  - Games & Education
  - Artificial Intelligence
  - Gamification
  - System thinking
  - Motion Capture
  - Serious Games
  - International collaboration
- Norway's largest and most up-to-date Motion Capture studio



# MORE ABOUT GAME SCHOOL

- <https://gameschool.inn.no/about-us/>



▼ Bachelor's Degree in Artificial Intelligence - Development and Application

T - Teaching subject, E - Elective course, M - Mandatory course, P - Professional training

Course		24 A	25 S	25 A	26 S	26 A	27 S
KIUA1000 Introduction to AI	M	10					
KIUA1002 Programming I	M	10					
KIUA1004 Probability and Statistics	M	10					
KIUA1001 Machine learning I	M		10				
KIUA1003 Discrete Mathematics	M		10				
KIUA1005 Programming II	M		10				
KIUA1006 Machine Learning II	M			10			
KIUA1007 Parallel and sequential data struct...	M			10			
KIUA1008 Applied regression	M			10			
Elective courses					30	30	
Development of AI systems							
KIUA2000 Interactive simulations	E				10		
KIUA2001 Human-centred design pri...	E				10		
KIUA2002 Computer Vision	E				10		
KIUA2003 High Performance Compu...	E					10	
KIUA2004 Deep Reinforcement Learn...	E					10	

▼ Course overview Bachelor in Game Technology and Simulation - Autumn 2024

T - Teaching subject, E - Elective course, M - Mandatory course, P - Professional training

Course		24 A	25 S	25 A	26 S	26 A	27 S
2MAT101 Mathematics I	M	10					
2PRO101 Programming I	M	10					
SPIS1001 Games & 3D Fundamentals	M	10					
2MAT201 Mathematics II	M		10				
2PRO201 Programming II	M		10				
2SPILL101 Game Design	M		10				
2ADS101 Algorithms and data structures for ...	M			10			
2DAN101 Databases and Networks	M			10			
2SPIS212 Games and Systems Thinking	M			10			
2SPF101 Gamification	M				10		
23DPRO101 3D-Programming	M				10		
2MAT301 Mathematics III	M				10		
2SPIM131 Game Engine Architecture	M					10	
2VSIM101 Visualisation and Simulation	M					10	
SPIS2001 Machine Learning and Artificial Int...	M						10
SPIS2900 Bachelor thesis	M					10	20
Sum (180 total)		30	30	30	30	30	30



# GAMES AND PROGRAMMING ASSIGNMENTS

## CNC (computer numerical control) milling machine simulator

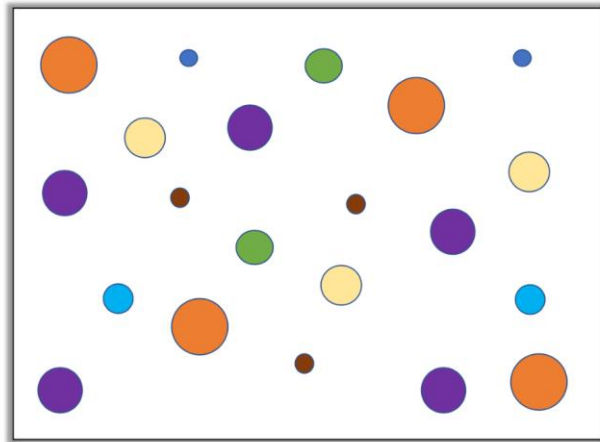
The following figure and table are a representation (an example) of what you need to develop. It does not mean your design must be exactly like this.

Your task is to ask the user how many shapes they want on this scene, or you can randomly generate those shapes on scene (Dynamically).

To make the above task easier for those who find it difficult to do it that way, you can have fixed points on space, and use that as your point (static).

Limit the 3D space so the objects are in the limited space for example: within 100 meters objects are distributed.

Each object has a Time to finish (TTF) which means every time you reach an object in space you have wait few seconds to finish that task (simulation of drilling/ molding machine)

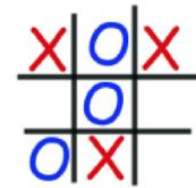


Make a simple version of "Tic-tac-toe"

This game is available all over the Internet. The senior students have done the same code as well. You have two options, go ahead and look it up on internet or ask your seniors for the source code or sit down think and solve the puzzle yourself.

You will not have access to seniors or internet during the final exam. It is time for you to practice and learn.

You can ask for help as always and learn from your classmate.



The game is for two human players that choose a field by turn. ( player 1, Player2)

The game can look like this: (Player 1 and Player 2 have had 1 turn each)

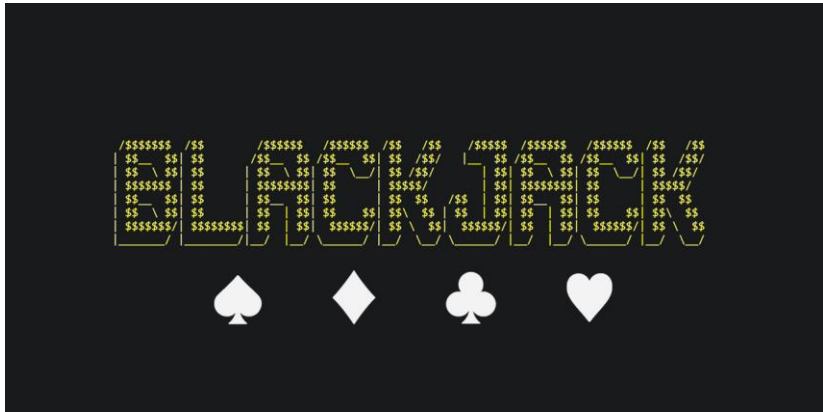
```
***** Welcome to Tic Tac Toe! *****
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

Player 1 - Write a number from 1 to 9: 3
| 1 | 2 | X |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

Player 2 - Write a number from 1 to 9: 5
| 1 | 2 | X |
| 4 | O | 6 |
| 7 | 8 | 9 |

Player 1 - Write a number from 1 to 9: █
```





space cadet pinball



Battleship

```

6| | | | | |
5| | | | | |
4| | | | | |
3| | | | | |
2| | | | | |
1| | | | | |
-----
|A|B|C|D|E|F|

```

The players shots at a cell where she guesses there is a ship, by giving the position of the cell with a letter and a number, as in chess. For each round the guessed cells is marked with M for miss and H for hit. The rest of the cells are blank, covering where there are ships.

After 3 rounds the players board can look like this:

```

Choose a cell to shoot at (example B3): A1
You have used 3 shots and have 1 hit of 11 ships.
6| | | | | |
5| | | | | |
4| | |M| | |
3| | |M| | |
2| | | | | |
1|H| | | | |
-----
|A|B|C|D|E|F|

```

```

      0 1 2 3 4 5 6 7 8 9
0 . . A . . . . . .
1 . . A . B . . . .
2 . . A . B . . . .
3 . . A . B . . . .
4 . . A . B . . . .
5 . . . . . . . . .
6 . . . . . . . . .
7 . . . . . . . . .
8 . . . . . . . . .
9 . . . . . . . . .

Destroyer:
Orientation: v
x and y coordinates: 4 1_

```





## Connect 4 Game (4 in a row)

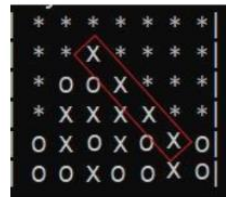
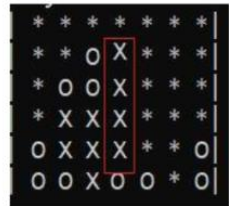
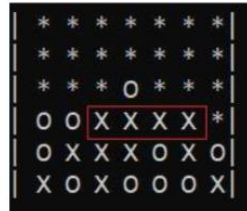
The classic Connect 4 game played on 6 high, 7 wide grids, the game board is populated with 42 pieces (bottom to top).  
Check the game online here:  
links to external website <https://www.silvergames.com/en/connect-4>

Players win if they can have 4 pieces in a row, horizontally, vertically, or diagonally. Following is an empty Board Layout, you are free to design the layout your own way.



Empty board Layout

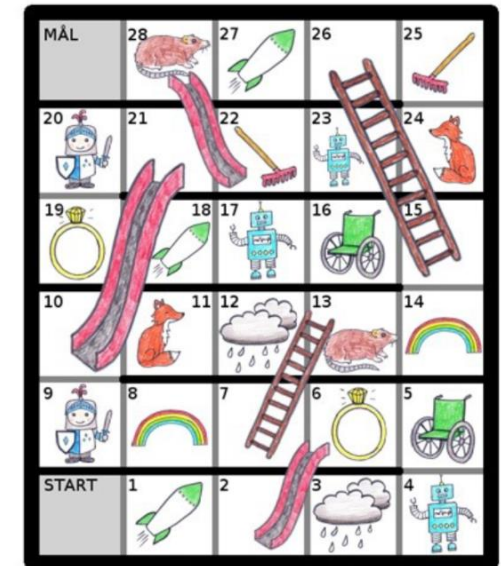
Following figures illustrate how the game can be played and some of the win conditions. There are multiple ways to win the game (horizontally, vertically or diagonally).



## chess

8								
7		b		b		b		b
6								
5								
4								
3								
2		B		B		B		B
1				L		K		L
		a		b		c		d
		e		f		g		h

## Snake and ladder



Thank you  
Ευχαριστώ

