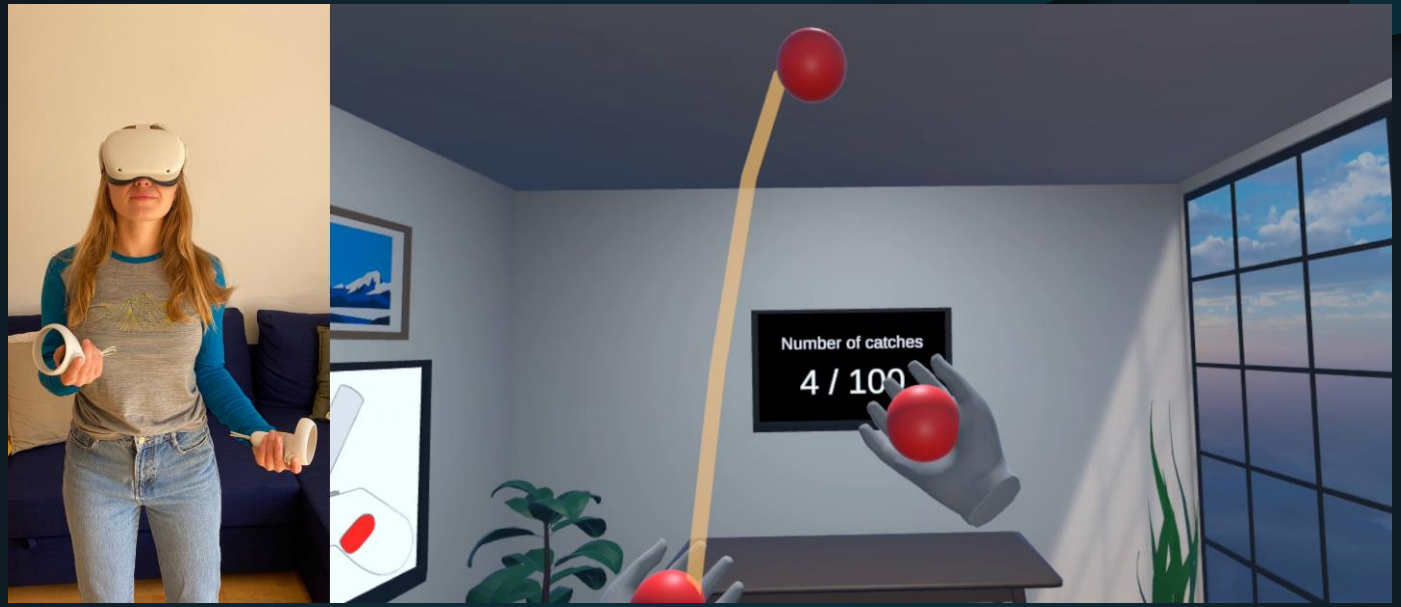
# PORTFOLIO

KACPER GĄSIOR

# My main projects




# VR Juggling Simulator – Master's Thesis


# VR Juggling Simulator Master's Thesis

Developed a Virtual Reality Juggling Simulator in Unity as part of my Master's thesis to explore motor skill acquisition and compare learning outcomes between VR and real-world training.

- **Realistic Physics**: Designed robust physics for accurate ball trajectories and collisions.
- **Gamified Learning**: Included adjustable difficulty levels, a progression system, and slow motion for personalized training.
- **Intelligent Guidance**: Implemented visual aids and audio guides to assist users with timing and positioning.
- **Enhanced User Experience**: Simplified juggling practice with features like resetting dropped balls at the press of a button.

**Results**: Used in a study showing that VR training increases engagement and builds foundational skills, even if initial performance transfer to real-world scenarios is limited.

**Skills/Tools**: Unity, C#, Oculus Quest 2, VR Interaction Design, Physics Simulation.

# Once Upon a Conquest


# Once Upon a Conquest

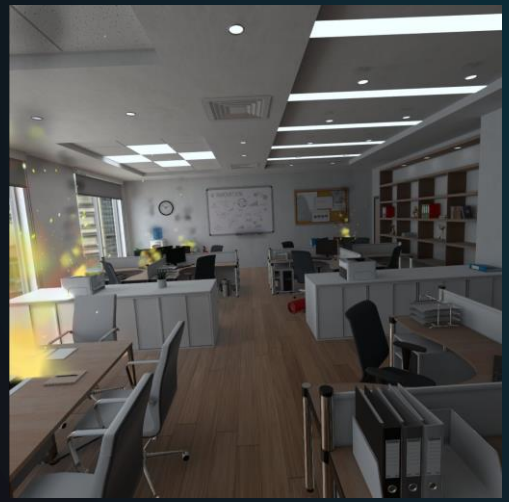
A **narrative-driven hack-and-slash platformer** with destructible environments and engaging combat mechanics.

- **Destructible Environments:** Objects and buildings shatter into pieces with multiple levels of destruction.
- **Dynamic Combat:** Features light and heavy attack mechanics, complemented by advanced enemy AI (e.g., patrolling, fear responses, and strategic attacks).
- **Intuitive Controls:** Built with Unity's New Input System, supporting both gamepad and keyboard controls.
- **Immersive UX:** Responsive animations and visual cues enhance the combat flow and user experience.

Check it out here.

**Skills/Tools:** Unity, C#, New Input System, Animation Systems, AI Behavior Programming.

# Fire Extinguisher Training



# Fire Extinguisher Training

Developed a **realistic VR training simulation** in **Unity** to teach fire safety skills in an engaging, controlled environment.

- **Interactive Simulation:** Users perform realistic actions such as grabbing the extinguisher, removing the safety pin, and extinguishing fires.
- **Performance Tracking:** Tracks metrics like task completion time and extinguisher usage to evaluate user efficiency.
- **Detailed Feedback:** Provides a post-training performance report to help users assess and improve their fire safety skills.
- **Immersive Experience:** Features a simulated room environment designed for high engagement and practical learning.

**Skills/Tools:** Unity, C#, VR Interaction Design, Performance Tracking Systems.

# Bedtime Bash

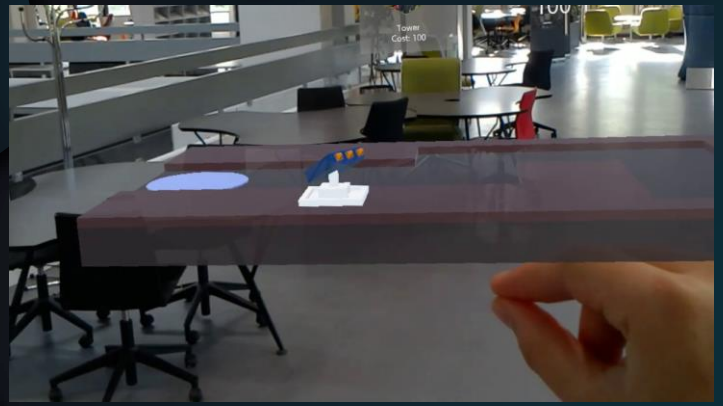
# Bedtime Bash

This project showcases my technical and leadership skills as I led a team of 3 programmers within a group of 18 members.

- **Team Leadership:** Gained strong management skills by breaking tasks into atomic components, delegating based on teammates' strengths, and ensuring deadlines were met.
- **Technical Challenges:** Aligned physical weapon mechanics with visual animations to create a cohesive player experience.
- **Enhanced AI:** Implemented a state machine pattern for enemies and leveraged Unity's **NavMesh** for improved navigation and behavior.

**Skills/Tools:** Unity, C#, NavMesh, State Machine Programming, Team Leadership.


# TowAR Defense

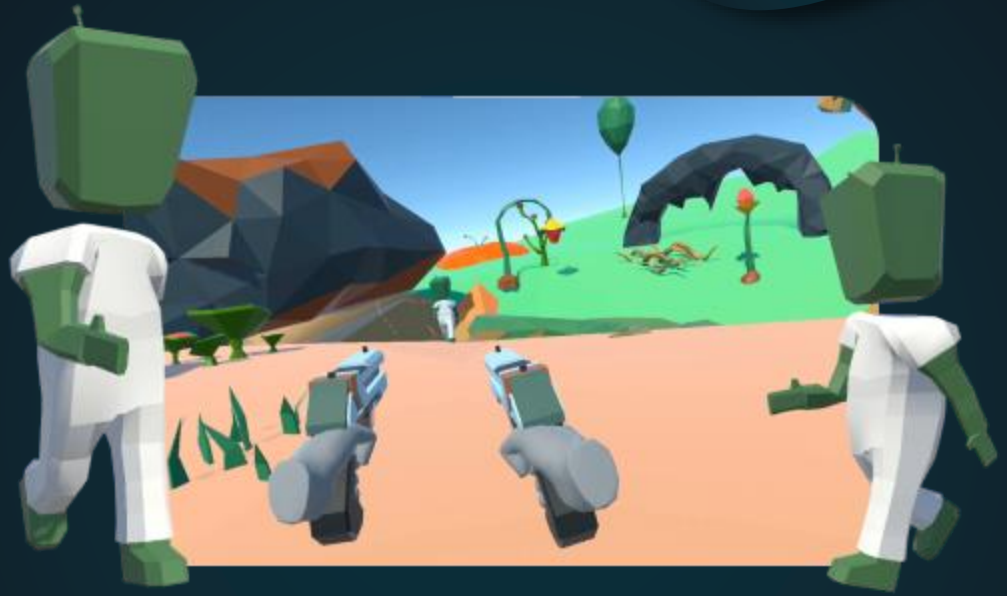


# TowAR Defense

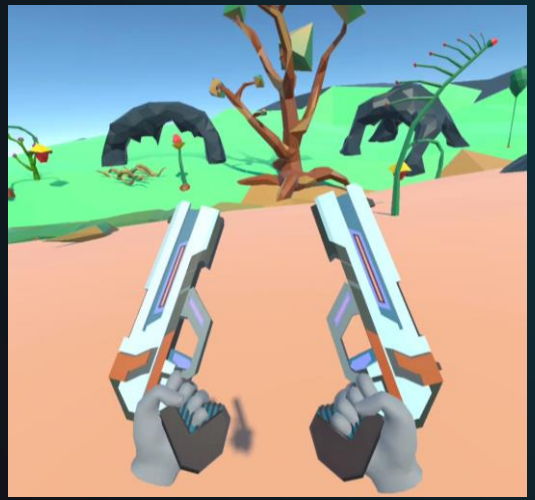
A tower defense-inspired game reimagined in augmented reality (AR) for the Microsoft HoloLens, designed to challenge players to defend their base from waves of attacking spiders.

- **AR Integration:** Utilized HoloLens spatial mapping to allow players to place the game board on any surface and engage in immersive gameplay.
- **Interactive Gameplay:** Players manually place defensive towers, enhancing user engagement through hand-tracking and spatial interaction.
- **3D Modeling and Animation:** Designed and created all 3D models and animations using Blender, contributing to the game's visual experience and dynamic gameplay.
- **Immersive AR Experience:** Fully tailored to take advantage of AR technology, with an emphasis on real-world interaction and spatial awareness.

**Skills/Tools:** HoloLens, Unity, AR Development, Blender, 3D Modeling, Animation.



# Alien Defense



# Alien Defense

A simple VR shooter where players must grab weapons from the ground and defend themselves against waves of incoming aliens.

- **Immersive Gameplay:** Players physically grab guns from the environment to fend off alien attackers in a fully immersive VR setting.
- **Optimized Performance:** Built with Unity's Universal Render Pipeline (URP) for better performance and smooth gameplay.
- **Enemy Pathfinding:** Implemented NavMesh components to calculate the enemies' paths, creating dynamic and engaging combat scenarios.
- **Beta Testing:** Currently in beta on AppLab, with testing conducted on the Oculus Quest 2, refining user experience and performance.

Check it out here.

**Skills/Tools:** Unity, URP, Oculus Quest 2, NavMesh, VR Development.


# Fox Runner



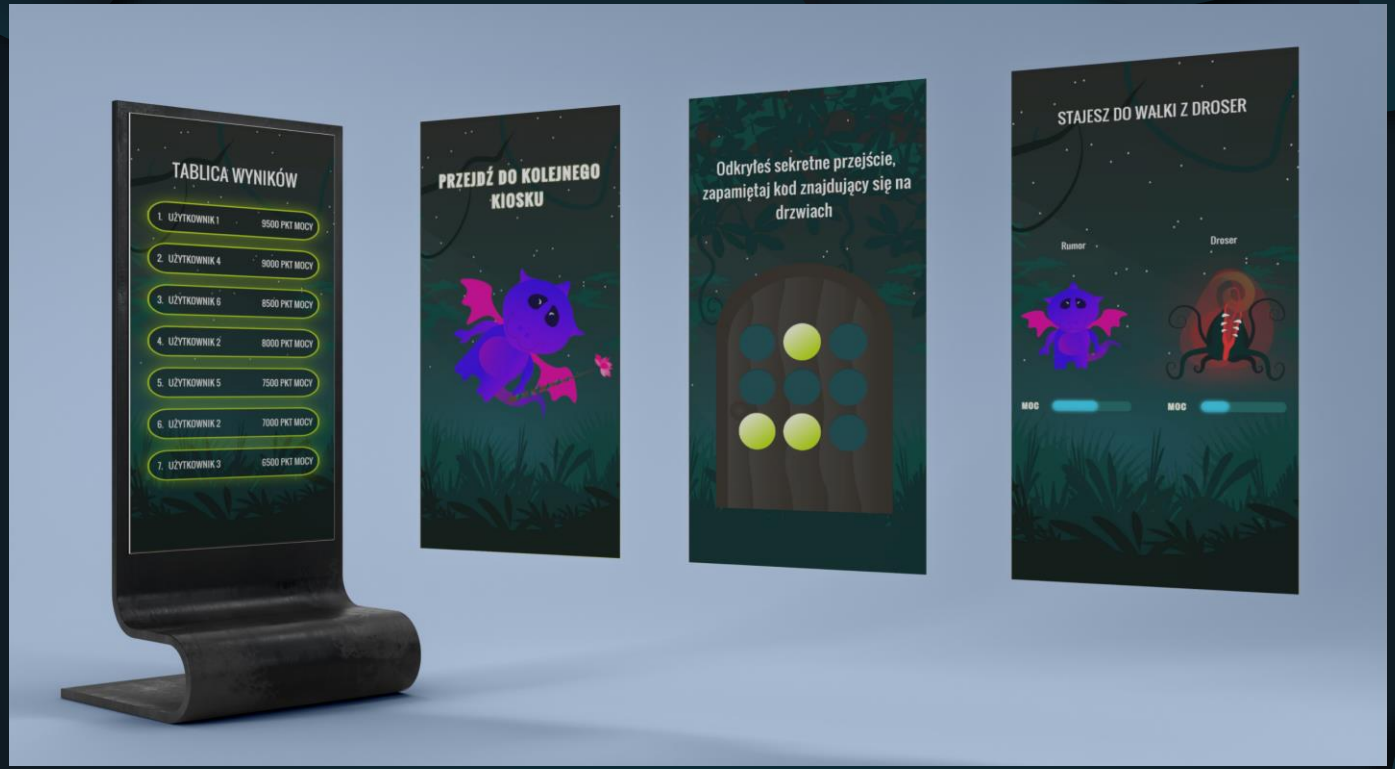
# Fox Runner

A 3D platform game where players aim to travel as far as possible while avoiding obstacles and collecting extra time by jumping over gates.

- **Motion Capture Integration:** Designed for play using the ZED motion capture camera, allowing for a unique and interactive experience through real-world movement.
- **Obstacle Generation:** Utilized object pooling for efficient and smooth obstacle generation, ensuring optimal performance.
- **Web Version Simulation:** The web version of the game simulates player motion using arrow keys for a more accessible experience.
- **Endless Challenge:** Features dynamic, procedurally generated obstacles to keep gameplay engaging and challenging as the player progresses.

Check it out here.

**Skills/Tools:** Unity3D, ZED Motion Capture, Object Pooling, Web Development, Game Design.




# Smoke Fusion



# Smoke Fusion

An interactive game designed for amusement parks, engaging children and encouraging physical activity by utilizing interactive screens distributed throughout the park.

- **RFID Integration:** Uses RFID cards to identify players and track their progress, creating a personalized experience.
- **Immersive Graphics:** Developed with Unity3D using the Universal Render Pipeline (URP) and custom shaders to achieve a glowing, visually striking effect.
- **Android Kiosk Design:** Optimized for kiosks with Android, providing a seamless experience on large interactive screens.
- **Test Version Available:** An online version is available for testing and simulating the experience before visiting the amusement park.

Check it out here.

**Skills/Tools:** Unity3D, URP, RFID Integration, Custom Shaders, Android Development.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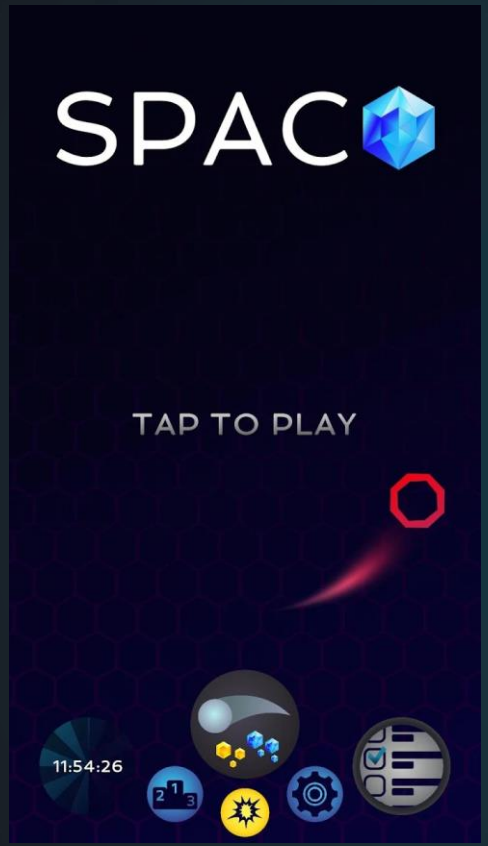


# Arcade game for Android

A one-of-a-kind arcade game created in collaboration with a colleague, featuring a fresh gameplay concept not seen in other games.

- **UI Design:** My first experience working with UI elements, where I created an intuitive and engaging interface for players.
- **Custom Assets:** Leveraged my graphic design skills to create all of the game's assets, giving it a unique visual style.
- **End-to-End Development:** Gained hands-on experience with implementing ads and publishing the game on Google Play.
- **Learning Journey:** This project was a major learning experience, teaching me valuable skills from UI creation to full game deployment.

**Skills/Tools**: Unity3D, UI Design, Firebase, Google Play Games, Ads Integration, Graphic Design, In-game Economy.

## Key features:

- **Daily challenges** to keep players engaged,
- Integrated ads for **monetization**,
- Google Play Games **leaderboard** for competitive play,
- **Firebase notifications** to keep players informed and motivated,
- **Daily roulette** offering exciting rewards,
- **In-game currency** to unlock various upgrades,
- Customizable player skins available in the shop,
- **Power-ups** to enhance gameplay and provide strategic advantages