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**MPAI Technical Report**

**Server-based Predictive Multiplayer Gaming**

**MPAI-SPG**

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| **WD0.0.2** |

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**Technical Report**

**Server-based Predictive Multiplayer Gaming**

# Introduction

In an online authoritative multiplayer game, each player uses a client to send control data to a server. The server updates the current game state with the data from all clients, and then broadcasts it to all clients. The data originating from a client may be properly or maliciously generated and properly received or not received at all. We do not consider the case when control data are corrupted by the network. In both cases, the game state received from the server does not describe a correct and consistent situation.

Current approaches to address the problem

* Overview
* Limitations

An alternative approach

* Description
* Novelty
* Advantages

# Scope

This document provides guidelines on the design and use of neural networks for the purpose of creating reliable and accurate prediction systems to predict absent or malicious players’ control data in an authoritative server context.

# Context

Use a neural network to predict and hand over the game state to the server. The server may use the predicted game state in case it is missing some controller data from one or more clients and uses it to detect inconsistent data received by the clients (e.g., due to cheating).

In this section we need to expand the description of the principles on which MPAI-SPG is based.

# Process Description

Describe the key steps needed to design and implement an MPAI-SPG model:

* + Select the game
  + Define the entities:
    - Types
    - Those players controlled and NPCs
    - How they affect the game state
  + Define the game state parameters
  + Train AI agents to simulate player controlled entities
  + Collect data for training the prediction network
  + Implement the predicting network:
    - Define the architecture
    - Define the training parameters
    - Compare results of different architectures
  + Implement the prediction network into the game
  + Test the quality of prediction in the game:
    - Define objective and subjective metrics
    - Collect and analyse data