

GameMatcher

Suggesting compatible video games based on your laptop's hardware specifications

Actionable Knowledge Representation

D1 - List of Key Terms & Concepts

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1 Project Overview

GameMatcher is an intelligent companion system that assists users in finding video games compatible with their computer. It checks the device's specifications, namely CPU, GPU, RAM, operating system, and storage, and then matches them against the requirements of each game.

Further, in addition to technical compatibility, it also takes into consideration the user's age, budget, and personal preferences, such as favorite genres and player modes, in order to recommend games both suitable and enjoyable. The result is a smooth, reliable, fully personalized gaming experience.

2 Domain and Goals

The project is in the domain of *Hobbies & Interests*, focused on video gaming and computer compatibility.

The goals of the project are:

- to verify whether a user's device meets the minimum hardware and software requirements of a videogame;
- to evaluate the suitability of videogames based on age restrictions (e.g., PEGI ratings);
- to filter games based on the user's budget and gameplay preferences.

3 Key Questions

The project focuses on answering the following key questions:

- Which video games can run smoothly on a specific computer or laptop?
- How do a game's system requirements relate to the user's hardware configuration?
- How can upgrades (e.g., RAM or GPU) improve compatibility and performance?
- Can the system suggest alternative or similar games that match the user's age, budget, and preferences?

4 Key Concepts and Key Relations

This section presents the core concepts (classes) and relations that define the project domain. These elements constitute the structured knowledge model of the system and will serve as the foundation for the ontology to be developed in the next submission.

4.1 Key Concepts

- **User:** represents an individual interacting with the system, providing personal information such as age, budget, preferences, and Computer specifications.
- **Computer:** the user's device, characterised by its hardware and software components.
- **Components:**
 - **CPU:** the processing unit of the Computer, described by its model and performance.
 - **GPU:** the graphics processing unit of the Computer.
 - **RAM:** the amount of system memory available.
 - **AvailableStorage:** the free disk space available on the Computer.
 - **OperatingSystem:** the operating system installed on the Computer (e.g., Windows, macOS, Linux).
- **Videogame:** a game in the system's database, characterised by minimum hardware requirements, gameplay features, price, and PEGI rating.
- **MinimumRequirements:** the minimal set of (CPU, GPU, Ram, ...) required for a videogame to run.
- **GameGenre:** the genre to which the videogame belongs (e.g., RPG, shooter, strategy).
- **PlayerMode:** the gameplay mode(s) supported by the videogame (single-player, multiplayer, co-op).
- **PEGIRating:** the age classification assigned to the videogame.

4.2 Key Relations

Table 1: Key Relations — 1st Part

Property Name	Relation	Description
Structural & Computer Relations		
hasComputer	User → Computer	Associates a user with their Computer.
hasCPU / hasGPU / hasRAM / hasOS / hasStorage	Computer → Components	Define the hardware and software components of the Computer.

Table 2: Key Relations — 2nd Part

Property Name	Relation	Description
Game Requirements		
requiresCPU / requiresGPU / requiresRAM / requiresOS / requiresStorage	Videogame → MinRequirements	Describe the minimum specifications required for a videogame.
Genre & Player Mode Preferences		
hasGenre	Videogame → GameGenre	Assigns a genre to a videogame.
preferredGenre	User → GameGenre	Indicates the user's preferred game genre.
hasPlayerMode / preferredPlayerMode	Videogame/User → PlayerMode	Represents the gameplay modes supported by the videogame or preferred by the user.
Pricing & Budget		
hasPrice	Videogame → xsd:float	Represents the price of a videogame.
hasBudget	User → xsd:float	Indicates the user's maximum budget.
Age & Content Rating		
hasAge / hasPEGI	User → xsd:int / Videogame → PEGIRating	Used to determine whether a videogame is suitable for the user's age.
Compatibility		
isCompatibleWith	Videogame → Computer	A <i>derived relation</i> indicating whether a videogame is compatible with the user's Computer.