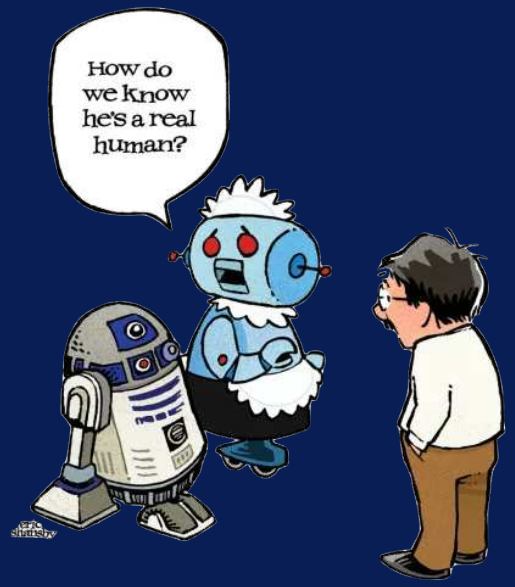
UNIVERSITÀ DEGLI STUDI
DI MILANO



AI For Video Games 2021/2022

How to play this course

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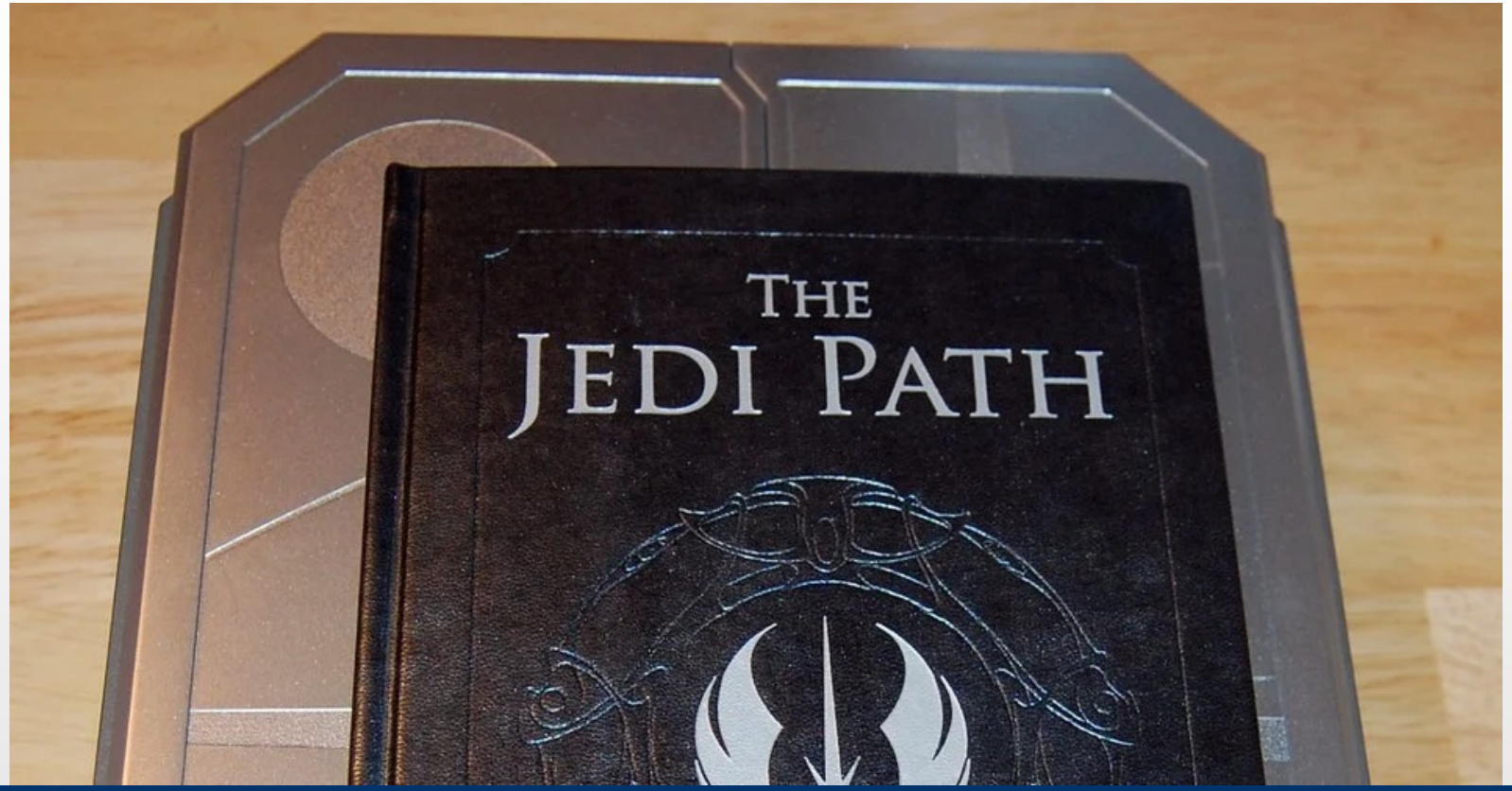
Playlab fOr inNovation in Games

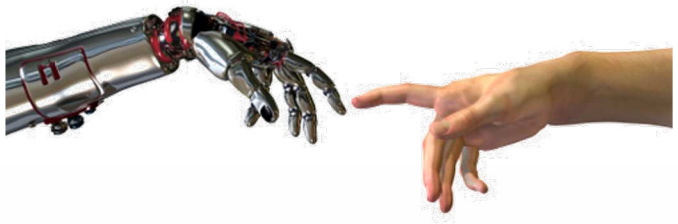
AI For Video Games ...

Belongs to the «Video Game path»
for the master degree in Computer Science

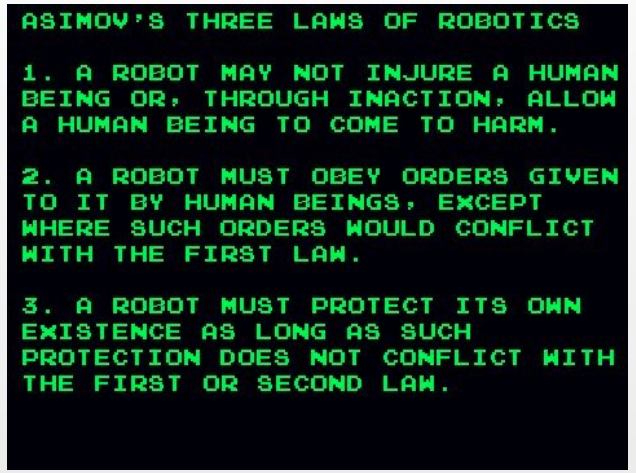


Today's Agenda

- Premise



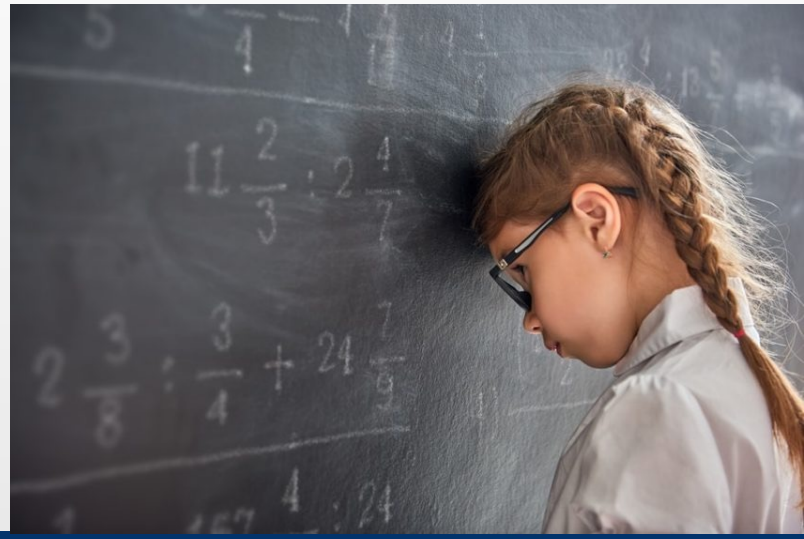
- What are we going to do? (goals and methodology)
- Rules (exams & c.)
- Other information



Premise

This class is:

- Intended for Master Students in Computer Science (CDL magistrale in informatica)
  In particular, for students following the “Video Game path”
- Taught (mainly) in English (including exams)
- Synergic with:
  - Online Game Design - Proff. *Maggiorini & Ripamonti*
  - Real-time graphics programming - Prof. *Gadia*
- Giving for granted a good knowledge about object oriented programming



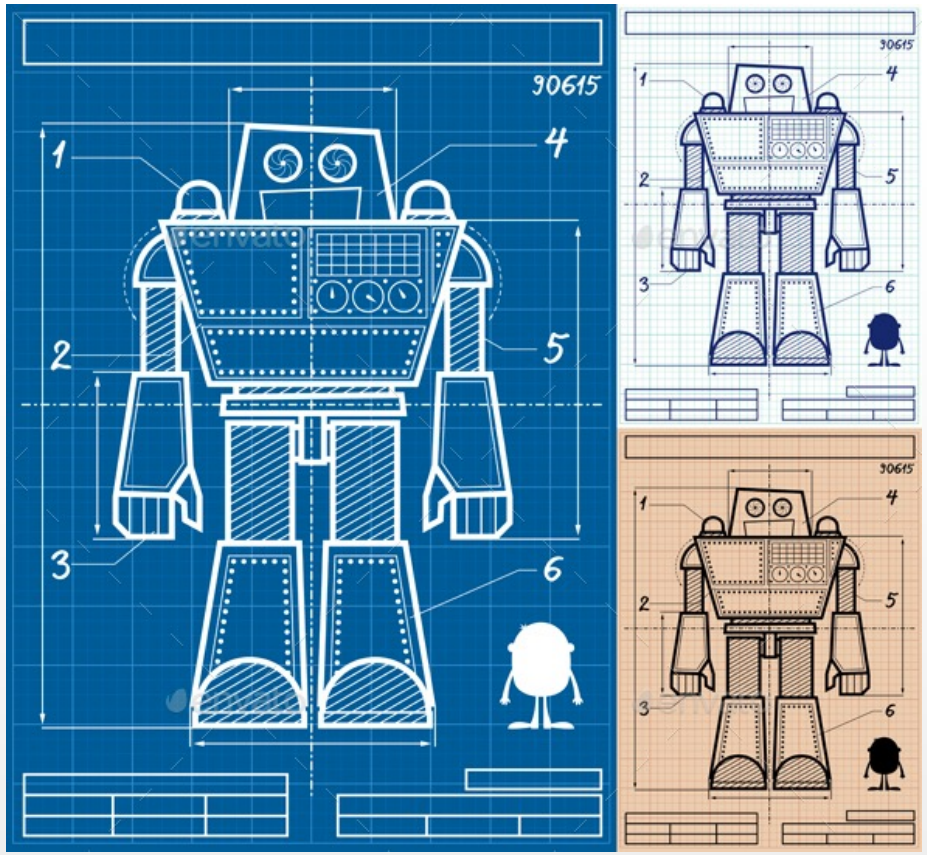
What are We Going to Do

- Goals:
  - To introduce the main application areas of AI in video games
  - To give basic concepts and techniques to develop AI solutions for the main game genres

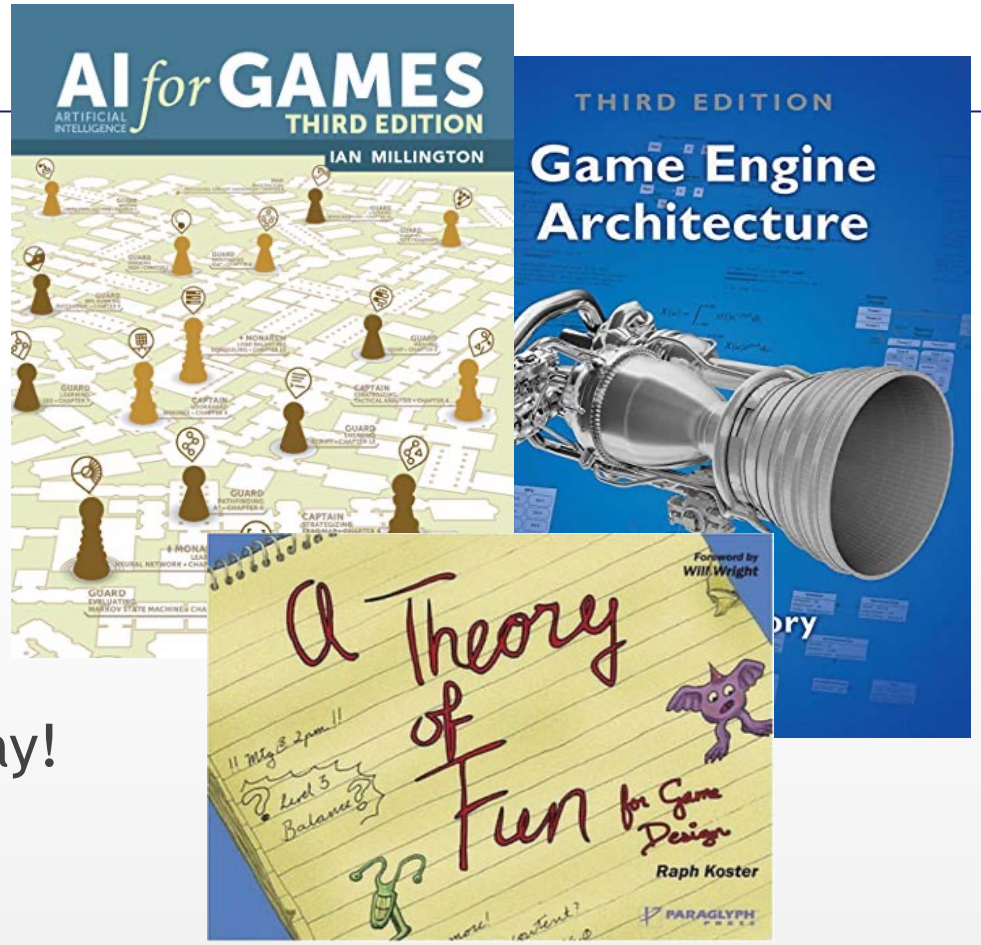
- Main Topics:
  - Basic concepts for game design
  - Application of AI to video games
  - AI inside a game engine
  - Main algorithms and techniques used in gaming

Topics

- Introduction
  - AI and gameplay
  - AI and game engines
- Theoretical part
  - Decision making
  - Describing behaviours
  - Planning
  - Pathfinding and Movement
  - Procedural Content Generation (PCG)
  - Agents coordination
  - Genetic algorithms (basics)
  - Application of Machine Learning (basics)
- Implementation techniques



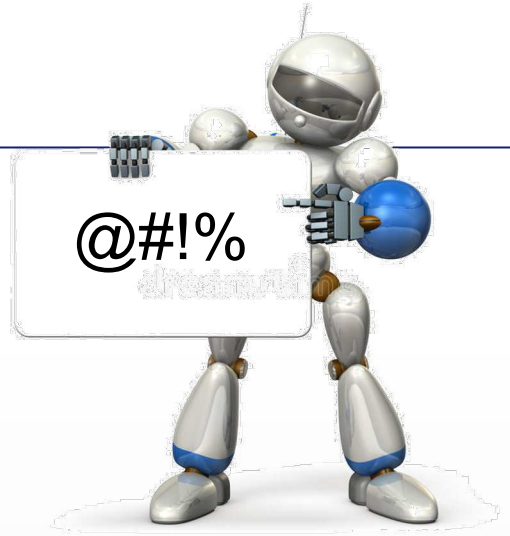
Textbooks and Lecture Notes



- Slides and additional lecture notes:
  - (http://aiforvideogames.ariel.ctu.unimi.it/)
- Reference book:
  - *AI for games* by Ian Millington & John Funge - Morgan Kaufmann (2019)
  - Other references will be provided along the way!
- More (suggested) books:
  - *Game Engine Architecture* by Jason Gregory – CRC Press (2018)
  - *A Theory of Fun for Game design* by Raph Koster – Paraglyph Press (2005)

Logistics

- When we start:
  - Wed. Sep. 29 (you are here, after all)



- Where we meet:
  - Wed. 10:30 – 12:30 room 3016
  - Thu. 10:30 - 12:30 room 3016

For students unable to attend a streaming will be provided
- Quarantined
- Not holding a green pass
- Coming from foreign countries

Date, time, and title for seminars will be notified along the way based on guests' availability

Lectures will NOT be recorded this year

ONLY FOR TOMORROW (9/30)
we will meet in room alfa

Class Schedule

- Available online
  - In the “files” area on teams (look in channel “General”)
  - Updated in real time (!)
    - Check it on a regular basis

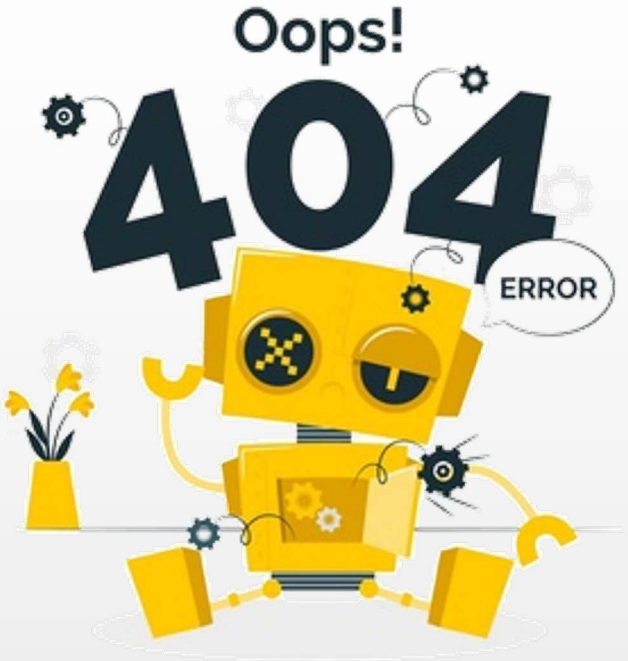
Exams

- Final evaluation will be based on:
  - Development of a project
    - We would like you to propose a topic
    - Unity is preferred but not mandatory
  - An interview (with each one of us)
- All details online in 2122_AIVG_Readme

Wrong Semester?

- You can have your project contributing to a project in the Online Game Design class
  - … even if it is in the second semester

- This is still valid, but you will have to wait until July to take the exam
  - You are not required to also take the OGD class
  - You are not required to take the exam at the same time as the other group



Tools of the Trade

Teachers

- Dario Maggiorini
  - dario@di.unimi.it
  - Office hours on Thu. by e-mail appointment
  - Pathfinding, movement

- Davide Gadia
  - gadia@di.unimi.it
  - Office hours by e-mail appointment
  - Decision strategies, PCG

Teaching Resources

- Microsoft Teams
  - Team name "AI4VG – Artificial Intelligence for Video Games"
  - Code to enroll: qx76tlo
  - Last-minute announcements and discussions

- Ariel
  http://aiforvideogames.ariel.ctu.unimi.it
  - Lecture notes and additional materials after each class
  - Announcements for logistic changes

- GIT repository
  git clone git://pong.di.unimi.it/classes/aivg/2122
  - All source code will appear there