

# CHALLENGING GAME DEVELOPMENT

**9 - 20.MAY.2022**

## PROGRAMME DESCRIPTION/OBJECTIVE

This Short-Advanced Programme is an introductory course for digital game development, covering the whole game development lifecycle, from the ideation to its analysis, creation of a storyboard, preparing assets, codifying the game logic, and testing. These topics will be addressed at a high level, allowing attendees to understand the different development phases, and how they integrate into a game project.

The main goal is to allow participants to know how to communicate inside heterogeneous teams.

Therefore, and although some programming basics would be preferable, the course aims at allowing a team composed of individuals with different backgrounds and knowledge to work together learning and developing a digital game.

## PROPOSED LEARNING OUTCOMES

At the end of this RUN-EU SAP students will be able to:

- Design a game idea, preparing its storyboard.
- Know what the different kind of assets are used in digital game development.
- Understand the way a game engine works, both at the editor and programming levels.

**+INFO:** [www.run-eu.eu](http://www.run-eu.eu)

Organised by: IPCA and NHL Stenden

**DATE** From 9 to 20 May 2022

**MODE OF DELIVERY** Blended

- Remote week, with recorded and live sessions, as well as work tasks: 9-13 May
- Presential week, with a few live sessions, and a game hackathon: 16-20 May

**LANGUAGE OF INSTRUCTION** English

**ECTS CREDITS** 2 ECTS

**EQF/LEVEL** ISCED 6 (BSc and up)

## ACADEMIC RECOGNITION

To be defined by each Home Institution. In general terms, most students will have this RUN-EU SAP certified in the Diploma Supplement, as a minimal condition.

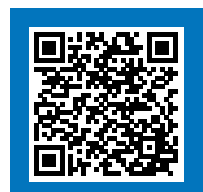
## ELIGIBLE PARTICIPANTS

Students from the areas relevant for game development:

- Computer science/programming.
- Digital illustration and animation.
- Digital media, sound, music,...

## HOW TO APPLY

Fill in the application form ([QR](#) or [website](#))



## SELECTION CRITERIA

The selection process will focus on:

- Diversity of teams' backgrounds.
- Knowledge on the area.

## CONTACT DETAILS

[SAPchallenginggamedevelopment@ipca.pt](mailto:SAPchallenginggamedevelopment@ipca.pt)



# CHALLENGING GAME DEVELOPMENT

**9 - 20.MAY.2022**

## SELECTION CRITERIA

The selection process will focus on:

- Diversity of teams' backgrounds.
- Knowledge on the area.
- Candidate motivation.

## LEARNING AND TEACHING STRATEGY

Pre-Recorded Tutorials and Talks, for "learn at your pace"

- Synchronous talks
- Small Work Challenges for autonomous learning
- Final Hackathon

## SPECIAL CONDITIONS

Access to a personal computer if possible

## PHYSICAL MOBILITY | SCHOLARSHIPS AVAILABLE

### For students

Travel: 350€/person | Subsistence: 400€/W

### For staff

Travel: 350€/person | Subsistence: 850€/W

## MEANS AND CRITERIA FOR ASSESSMENT

- Participation and public presentation of the game developed during the Hackathon
- A final report focusing on the learning outcomes
- A pass and fail assessment will be used in this SAP

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## CERTIFICATION

The participants who successfully complete this RUN-EU SAP, will receive a Certificate of Participation and a Transcript of Records jointly issued by the organising institutions.

## COURSES LEADERS | LECTURERS

### Courses leaders

Alberto Simões (IPCA)  
Duarte Duque (IPCA)  
Gerald Kooistra (NHL Stenden)  
Niels Doorn (NHL Stenden)

### Lecturers

António Teixeira (IPCA)  
Marco Vale (IPCA)  
Catarina Lopes (IPCA)  
Eva Oliveira (IPCA)  
Diogo Pereira (IPCA)  
Jop Wielens (NHL Stenden)  
Gonzalo Cid (NHL Stenden)  
Gerjan van Oenen (NHL Stenden)  
Mark Winkel (NHL Stenden)  
Jeroen Nauta (NHL Stenden)  
Niels Doorn and/or Elise Siersema (NHL Stenden)



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## PROGRAMME AT A GLANCE

+INFO: [www.run-eu.eu](http://www.run-eu.eu)

	UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
	GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
<b>MONDAY</b> 9/05		WELCOME SESSION		GAME DESIGN LECTURE WORKSHOP I			GAME DESIGN LECTURE WORKSHOP II		MANAGING ASSETS I PIXEL ART - 2D ANIMATION			
<b>TUESDAY</b> 10/05		MANAGING ASSETS II 3D MODELLING		MANAGING ASSETS III SOUND AND MUSIC			MANAGING ASSETS IV 3D MODELLING		MANAGING ASSETS IV 3D ANIMATION			
<b>WEDNESDAY</b> 11/05		MEET YOUR TEAM GROUP WORK		UNITY SESSION I			DEVELOPMENT METHODOLOGIES		UNITY SESSION II			
<b>THURSDAY</b> 12/05		GROUP WORK		AI SESSION I			AI SESSION I		GROUP WORK			
<b>FRIDAY</b> 13/05		PLENARY SESSION PROJECTS PRESENTATION AND DISCUSSION										
<b>MONDAY</b> 16/05		WELCOME SESSION WORK PLAN		VR AND AR WORKSHOP					GROUP WORK			
<b>TUESDAY</b> 17/05		DAILY MEETING	GROUP WORK	WORKSHOP MOCAP					GROUP WORK			
<b>WEDNESDAY</b> 18/05		DAILY MEETING	GROUP WORK	ETHICS OF GAMES					CULTURAL ACTIVITY			
<b>THURSDAY</b> 19/05		DAILY MEETING	GROUP WORK						GROUP WORK			
<b>FRIDAY</b> 20/05		DAILY MEETING	GROUP WORK					GAME SHOWCASE SESSION	HOW YOU LEARN ACTIVITY			



# CHALLENGING GAME DEVELOPMENT

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9 MAY

MONDAY 9h00-16h30 GMT

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
MONDAY 9/05	WELCOME SESSION		GAME DESIGN LECTURE <small>WORKSHOP I</small>			GAME DESIGN LECTURE <small>WORKSHOP II</small>		MANAGING ASSETS I <small>PIXELART - 2D ANIMATION</small>			

## Welcome Session

🕒 9h00-10h00  
👤 SAP Organizers

📄 This is the welcome session. Details on the goals of the SAP and how it will work will be depicted. It will also be the occasion to let the organizers to present themselves, as well as the participants to share their interest in the SAP, their background, and their goals.

### Workshop I

## Game Design Lecture

🕒 10h30-11h30  
👤 Marco Vale & Eva Oliveira (IPCA)

📄 In this class we will look at games and identify their elements and how can we work on them to design a specific kind of game. We will talk about the tools we have at our disposal to design games.

### Workshop II

## Game Design Lecture

🕒 13h30-14h30  
👤 Jop Wielens (NHL Stenden)

📄 In this session Jop Wielens will challenge the attendees to look for conceptual angles in developing interesting games. How to use specific characteristics of a chosen team to ensure engagement beyond simple joy. Game mechanics, core principles and a lot of creativity can be expected. For this lecture no specific software is needed.

## Managing Assets I Pixel Art - 2D Animation

🕒 15h30-16h30  
👤 Marco Vale (IPCA)

📄 In this session, the attendees will be introduced to the core elements, tools and methods of creating pixelart. By understanding the basics of illustration and shading, attendees will then be capable to carry out more complex challenges. With a set of frames created, the session will then move into adding animation and using it inside of a game engine, for game implementation. Attendees are required to bring a personal computer with Krita and Unity installed.



# CHALLENGING GAME DEVELOPMENT

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10 MAY

TUESDAY 9h00-16h30 GMT

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
TUESDAY 10/05	MANAGING ASSETS II 3D MODELLING		MANAGING ASSETS III SOUND AND MUSIC			MANAGING ASSETS IV 3D MODELLING		MANAGING ASSETS IV 3D ANIMATION			

## Managing Assets II 3D Modelling

🕒 9h00-10h00

👤 Mark Winkel (NHL Stenden)

📄 In this session, the attendees will be introduced to the core elements, tools and methods of creating 3D-models. Working from reference and diving into topology will help the attendees in sculpting characters and assets. Attendees are required to bring a personal computer with 3D-software of their preference installed.

## Managing Assets III Sound and Music

🕒 10h30-11h30

👤 Gonzalo Cid (NHL Stenden)

📄 In this session we'll discuss the artistic considerations related to sound design and composition. We will see a few ways in which we use thinking tools to be able

to unleash creativity. I will also show a few music production tools we can use to create music and a few connections to game scoring such as cut scenes, loops and layers. Finally, we'll talk about convolution and its connection to game sound effects, dubbing and Foley.

## Managing Assets IV Lighting & Set Dressing

🕒 13h30-14h30

👤 Jeroen Nauta (NHL Stenden)

📄 In this session the attendees get introduced in the basic principles of lighting and also setting up the lighting in a 3D scene. After that the attendees learn to set up an indoor scene with assets and lighting, based on reference material.

## Managing Assets V 3D Animation

🕒 15h30-16h30

👤 António Teixeira (IPCA)

📄 In this session, the attendees will be introduced to the core principles of animation, some common tools and methods to 3D software to work and fine tuning animations, understand timing and acting principles and at the end, how to export your animation to a game engine in an effective and simple way. This presentation relies on Maya Software, but can be easily translated to other common 3D platforms, as Blender, 3dsMax or Cinema4D.



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**11 MAY**

**WEDNESDAY 9h00-16h30 GMT**

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
WEDNESDAY 11/05	MEET YOUR TEAM <small>GROUP WORK</small>		UNITY SESSION I			DEVELOPMENT METHODOLOGIES		UNITY SESSION II			

## Meet your Team Group Work

🕒 9h00-10h00  
👤 SAP Organizers

📄 In this group work session the teams will be presented. Each team will be invited to join in a separate room/channel, to understand their differences, competences and their tastes. Teams will be invited to create a Miro board with detail of each team member profile in the group, the games they like, and what would be a nice project to be developed during the program.

## Unity Session I

🕒 10h30-11h30  
👤 Catarina Lopes (IPCA)

📄 This session gives an introduction to the Unity tool, focusing on the scene editor. It will focus the creation and manipulation of objects in the scene, creating objects hierarchies, assigning components and activating physics. It will also include a brief introduction to terrain building.

## Development Methodologies

🕒 13h30-14h30  
👤 Gerjan van Oenen (NHL Stenden)

📄 In this session we will be discussing several Software Development Methodologies and their pro's and cons. Is the Waterfall development method really that outdone and/or obsolete? Why is everything Agile SCRUM these days? And where does Rapid Application Development (RAD) fit in the entire picture?

## Unity Session II

🕒 15h30-16h30  
👤 Catarina Lopes (IPCA)

📄 This session given an introduction to programming in Unity, namely how to create components, and how to deal with event based programming.

It will include managing collisions, passing data between objects and updating the game state. It will also give a brief introduction on the programmatic creation of objects.



# CHALLENGING GAME DEVELOPMENT

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12 MAY

THURSDAY 9h00-16h30 GMT

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
THURSDAY 12/05	GROUP WORK		AI SESSION I				AI SESSION I			GROUP WORK	

## Group Work

🕒 9h00-10h00  
👤 Participants

📄 After knowing each other, in the previous day, the team will not deal on what kind of game they want to develop. They should define the subject, genre, target age, and start planning a Game Design Document.

## Group Work

🕒 15h30-16h30  
👤 Participants

📄 At this point, the participants have the basic knowledge to prepare their game idea. In this session they will discuss the concept, define properly the game design document, and prepare a formal presentation for the next day.

## AI Session I

🕒 10h30-11h30  
👤 Alberto Simões (IPCA)

📄 This session will explore Unity plugins that help the creation of Artificial Intelligence behaviors on games. For each tool, the concepts and theoretical background will also be discussed.

## AI Session II

🕒 13h30-14h30  
👤 Alberto Simões (IPCA)

📄 While not directly used in games, Unity has an agent-based learning workflow, that makes the creation of reinforcement machine learning simple and enjoyable. In this session this set of tools will be presented, and a simple example of reinforcement learning will be created.



# CHALLENGING GAME DEVELOPMENT

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**13 MAY**

**FRIDAY 9h00-12h00 GMT**

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
FRIDAY 13/05	PLENARY SESSION PROJECTS PRESENTATION AND DISCUSSION										

## Plenary Session: Projects presentation and discussion

- 🕒 9h00-12h00
- 👤 SAP Organizers

📄 Each team will have 15 minutes to present their game idea. The presentation should be based on a pitch, on why this game is relevant,

considering the current trends, and what features will be developed during the next week. At this point, other teams will be invited to discuss and comment on each other proposals, in order to grow the proposal strength and feasibility.

**16 MAY**

**MONDAY 9h00-16h30 GMT**

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
MONDAY 16/05	WELCOME SESSION <small>WORK PLAN</small>		VR AND AR WORKSHOP				GROUP WORK				

## Welcome Session

- 🕒 9h00-10h00
- 📄 Physical Work Plan

📄 Welcome session for the physical week. Group meeting live. Presentation of the presential week flow and activities.

### Workshop I

## VR and AR

- 🕒 11h00-12h00
- 👤 Diogo Pereira (IPCA)

📄 This workshop aims to provide an introduction to the development of Virtual Reality applications. It will cover aspects related to VR hardware, libraries used for development support and its integration in a game engine.

## Group Work

- 🕒 15h30-16h30
- 👤 Participants

📄 At this point, the participants have the basic knowledge to prepare their game idea. In this session they will discuss the concept, define properly the game design document, and prepare a formal presentation for the next day.



# CHALLENGING GAME DEVELOPMENT

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17 MAY

TUESDAY 9h00-16h30 GMT

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
TUESDAY 17/05	DAILY MEETING	GROUP WORK	WORKSHOP MOCAP					GROUP WORK			

## Daily Meeting

- 🕒 9h00-9h30
- 👤 SAP Organizers

📄 Scrum meeting discussing game evolution and next steps.

## Group Work

- 🕒 10h00-10h30
- 👤 Participants

📄 Team Work on Game Development.

## Workshop I

### Mocap

- 🕒 11h00-12h00
- 👤 Duarte Duque (IPCA)

📄 In this workshop the production pipeline of video game character animations will be presented, starting with the design of the character's 3D model, through rigging, and skinning, culminating in the subsequent application of the captured motion to the 3D model.

## Group Work

- 🕒 14h00-16h30
- 👤 Participants

📄 Team Work on Game Development.



# CHALLENGING GAME DEVELOPMENT

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18 MAY

WEDNESDAY 9h00-19h00 GMT

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
WEDNESDAY 18/05	DAILY MEETING	GROUP WORK	ETHICS OF GAMES					CULTURAL ACTIVITY			

## Daily Meeting

- 🕒 9h00-9h30
- 👤 SAP Organizers

- 📄 Scrum meeting discussing game evolution and next steps.

## Group Work

- 🕒 10h00-10h30
- 👤 Participants
- 📄 Team Work on Game Development.

## Ethics of Games

- 🕒 11h00-12h00
- 👤 Niels Doorn and/or Elise Siersema (NHL Stenden)

- 📄 An introduction on using moral imagination to practice ethical game design. We will talk about some ethical dilemmas that can take place in game design. Moral imagination will be introduced as a tool to make, and recognize ethical choices when they occur.

## Cultural Activity

- 🕒 14h00-19h00
- 👤 Participants
- 📄 Team Work on Game Development.



# CHALLENGING GAME DEVELOPMENT

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**19 MAY**

**WEDNESDAY 9h00-16h30 GMT**

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
<b>THURSDAY 19/05</b>	DAILY MEETING		GROUP WORK					GROUP WORK			

## Daily Meeting

- 🕒 9h00-9h30
- 👤 SAP Organizers

📄 Scrum meeting discussing game evolution and next steps.

## Group Work

- 🕒 10h00-10h30
- 👤 Participants

📄 Team Work on Game Development.

## Group Work

- 🕒 14h00-16h30
- 👤 Participants

📄 Team Work on Game Development.

**20 MAY**

**FRIDAY 9h00-16h00 GMT**

UCT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
<b>FRIDAY 20/05</b>	DAILY MEETING	GROUP WORK					GAME SHOWCASE SESSION	HOW YOU LEARN ACTIVITY			

## Daily Meeting

- 🕒 9h00-9h30
- 👤 SAP Organizers

📄 Scrum meeting discussing game evolution and next steps.

## Group Work

- 🕒 9h30-11h30
- 👤 Participants

📄 Team Work on Game Development.

## Game Showcase Session

- 🕒 13h30-15h00
- 👤 SAP Organizers

📄 Public presentation on the final games.

## How You Learn Activity

- 🕒 15h30-16h00
- 👤 SAP Organizers

📄 Group discussion on the How You Learn activity, evaluating the SAP outcomes.