2020

VIDEOJOGOS

12th INTERNATIONAL CONFERENCE
on **VIDEOGAME SCIENCES** and **ARTS**

book of abstracts

videojogos2020.ipb.pt

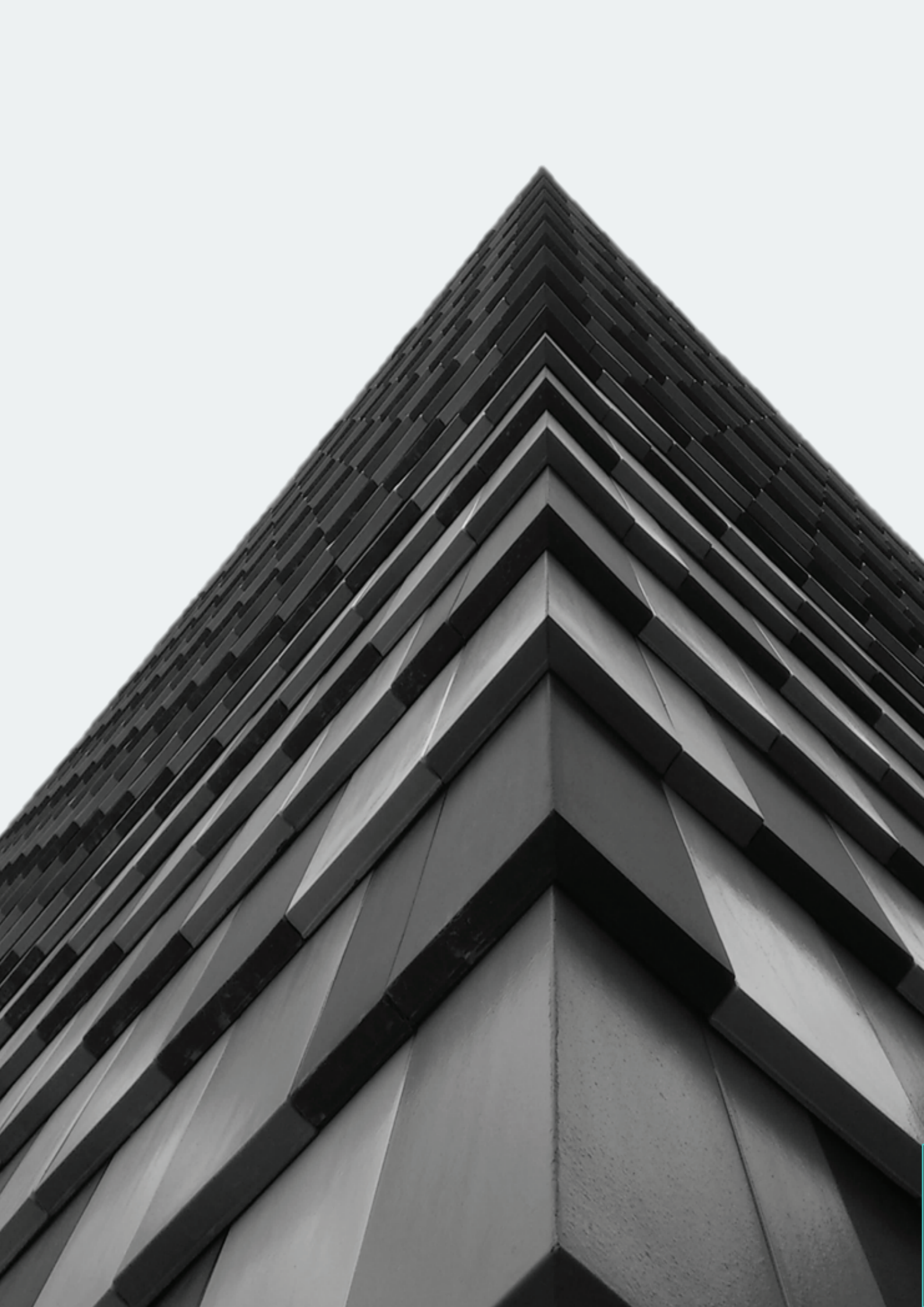
A dozen pixeleggs...
26-28 November 2020

Videojogos 2020 is the 12th International Conference on Videogame Sciences and Arts.

It is a joint organization between the School of Public Management, Communication and Tourism – Polytechnic Institute of Bragança (EsACT – IPB) and the Portuguese Society of Videogames Sciences (SPCV).

As in previous editions, this conference gathers researchers, professionals in the extended area of videogames, teachers and students in a forum to discuss videogame related topics and their impact on various aspects such as society, health, heritage, economy or education. The goal is to promote the exchange of ideas, share experiences and results in the areas of interest, through presentations, workshops, interactive demos and panels.

Mirandela . 2020



Title
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Book of Abstracts

Communication and Design Edition
Carlos Casimiro da Costa & Bárbara Barroso

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WORKSHOPS

Workshop chairs:
Rogério Azevedo Gomes (PT) & Rogério Tavares (BR)

26 November (Thursday)

10h00 Pre-conference Workshop 1:
The Tools of the Producer – Agile Methodologies and Risk Registers
Inês Lagarto

"On this workshop you will find an introduction to what it means being a producer on a day to day basis and try to cover two of the main tools of the producer: the Agile Methodologies and the Risk Register."

Requirements:
Computer or Smartphone, Excel, pen and paper.

10h00 Pre-conference Workshop 2:
Polar Survival
Mikel Carpio, Pedro Barragán, Fernando Jesús Pérez, Juan Piccoli, Laura Schober and Sergio Uceda

"While playing Polar Survival, you will have to find enough food to survive. Seals are part of the polar bear´s diet you´ll incarnate, but the glacier you are living in is melting as time passes, and those seals will try to escape, furthermore, there are several chances for you to face other polar bears which are hungry as well, and that will turn your survival trip into a really dangerous task."

Requirements:
Computer or a mobile phone and internet connection to download the game. If they are going to play in a mobile device, the game is only available for Android.

14h00 Pre-conference Workshop 3:
Pacversary
Raquel Llaneza, Álvaro García, Vicente Cupello, Cristina Rodriguez, Alejandro Pérez and Enrique Maldonado

“In the workshop, we will touch on the four primary principles of the development of a newsgame, explaining each one in detail and having the audience participate in a practical example of design of a newsgame.”

Requirements:
Internet connection and imagination.

14h00 Pre-conference Workshop 4:
How to use free motion capture data to animate game characters
João Victor Boechat Gomide and Marcelo Tannure

“The objective of this workshop is to show how to use motion capture data, available for free on the web, to animate characters for digital games. The intention is to demonstrate how to find the correct movement data and how to apply it to a rigged character and integrate it with other animations, organically. In order to be able to show the entire workflow for the duration of the workshop, Autodesk's MotionBuilder software will be used. The software already comes with rigged characters and the interface is prepared directly to work with motion capture data. At the end, it will be shown how to do all the wokflow in Blender, highlighting the equivalences of the steps taken to retarget the animation for the character in MotionBuilder. At the end of the workflow, the user will have animated characters correctly prepared for use in engines, such as Unreal and Unity.”

Requirements:
Intermediate knowledge of animation of 3D, characters, preferably knowing how to rig and skinning a character. Participants must have installed, on their computers, the educational or trial version of MotionBuilder, as well as Blender.

KEYNOTES

Conference chairs:
Inês Barbedo (PT) & João Paulo Sousa (PT) & Beatriz Legerén (ES)

27 November (Friday) 9h30

RUI CRAVEIRINHA
Rui Craveirinha is Games User Researcher at Player Research, getting all manner of insight on how players play their videogames. He has a PhD in Information Sciences and Technology (specialized in Human--Computer Interaction) and a great passion for videogame design, research and development. His past research covers, mostly, game design studies and development of new tools for video game development.

“The Art of Play”
What are video games? Why do we play them? What makes them feel so special to play? Is it - as everyone so fervently believes - that they’re art? What even is art, anyway?
Legend has it that I was born with a famicom controller… father tells me the cable served as the umbilical cord. It’s thus no surprise that I spent most of my waking life feverishly musing on these deep questions, whether I was criticizing games for IGN or teaching Game Design at the University.
In this talk I will take you on a journey of the personal and the universal, retelling three distinct Histories: the History of (Video) Games, from Chess to The Last of Us Part II; the History of Aesthetics, from Plato to Dickie; and my own personal history, from playing famicom to analysing players experience at Player Research. Together, these stories will intertwine in a way that might just answer all those questions.
My answers can surprise, provoke, and on the rarest of occasions, may even provide true insight. By the end, I hope to have at least convinced you of why video games are a wondrous medium which state of the art theories and tools often downplay in terms of their sheer complexity, novelty… and beauty.

28 November (Saturday) 9h30

OSCAR GARCÍA PAÑELLA

Oscar García Pañella directs the Videogame Degree at ENTI-UB Barcelona, the online Gamification & Transmedia Storytelling Master Program for the IEB School and co-directs the Serious Games for Health & Sport initiative (ENTI-UB and the Harvard Medical School). In addition to that, Oscar García Pañella works as a senior Gamification consultant for Cookie Box, as a way to bring the fields of Transmedia and Dramanagement to the Human Resources Departments.

“Seeking presence through virtuality – applying gamification to support the memorable experiences we deserve”

We are still confined. Both physically and mentally, one or another or both depending on our specific context. And we are human beings and thus with the need of social interaction, fantasy experimentation, true storytelling and memorable challenges. We people love to explore, socialise, communicate, share, help, achieve... and we need to feel engaged while doing so. Even more if using virtual devices for the majority of our communications. And because we are the users, we should be at the centre of any design. Therefore, is there a science that can help us all to achieve the correct creation of valuable remote and/or hybrid experiences? Can we learn to design in a way that extracts the best opportunities from our current situation by allowing us to keep our networking alive while maintaining rigor and guaranteeing fun (and seriousness)? How can we expect to adapt ourselves to the "new" transmedia means available if not designing from both the experiential and memorable views? Welcome to the playing realms of motivational design and gamification!

POSTERS

Poster chairs:
Jorge Palinhos (PT) & Markus Wiemker (DE) & Belén Mainer Blanco (ES)

27 November (Friday) 12h00

Games for Cultural Inclusion: Human, Society and Noology
Diego Mergener, Pedro Cardoso and Bruno Giesteira

“People of foreign nationalities end up facing difficult situations due to the cultural differences between them and the country where they currently live: customs, language, etc. To address this situation, we pose the question of how games and ludic activities value the dissimilarities between people in the social, physical and noological dimensions in their culture in order to promote social inclusion and teamwork in the contexts of academia and enterprises. And how can these games and ludic activities be designed. This work presents an overview of the themes and subjects that involve the design of games and ludic activities to promote inclusion and teamwork, highlighting the relationships of these games with the anthropological cultural triangle proposed by the anthropologist Misha Titiev. It then is questioned whether it is possible for games to focus on more than one dimension of the Cultural Triangle and, if so, how these games can be designed.”

Keywords: Game design, Inclusion, Cultural Anthropology, Empathy.

The Progressive penetration of data analysis and dynamic design adjustment in games: A journey through adaptable experience
Andrés Olmedo Moreda and Héctor Puente Bienvenido

“The design systems used in video games are in constant optimization and evolution towards a fully adaptive user experience. They are applied both in the gaming medium and transferred to the most varied experiences, through hybridization of the digital and physical world or without it. These innovations respond to the demands of a growing audience, and therefore, one made up of people with unique characteristics. Video games as cultural devices are been adapted to users through tools that allow monitoring and analyzing the performance or player’s tastes in order to adjust and tune user experience. Dynamic Design Adjustment not only allows the game to be adapted in real time based on the decisions and behavior of the player but also favors the enjoyment and social

inclusion, without forgetting the capacities and possible limitations of the users, thus following the Design Justice approach. We carry out this research on the most relevant trends in Dynamic Game Adjustment through a methodological triangulation that combines in-depth expert interviews and a systematic review of games and the latest dynamic balancing and analytics tools available to game developers."

Keywords: User Experience (UX), Data Driven Design, Dynamic Design Adjustment (DDA), Dynamic Game Balancing, Adaptable Game Experience.

A user experience study in a vertical slice version of a videogame
Pedro Inácio, Guilherme Saturno and Lília Marcelino

"The present work was carried out to conduct a user playtesting to determine players' interaction with a vertical slice version of the video game 'Otherworldly Math'[1], developed in the project entitled "GBL4deaf- Game-based Learning for Deaf Students"[1] to support mathematics learning for deaf and hard of hearing students. Five hearing boys, one Portuguese and four Brazilian, varying from 16 to 18 years of age participated in the study. A usability questionnaire were applied before, and after participants played the vertical slice. Before playability, to determine their previous experience with video games. After playability, to collect data about participants' overall experience with the prototype, followed by the application of an engagement questionnaire to gauge the state of the user experience. Due to the Covid-19 present scenario, the user playtesting was monitored by the observers, using a video chat platform with screen sharing. During playability, observers noted the players' interactions in the game, filling an observational grid. The data collected was analysed and design problems identified. The results showed that the prototype built a positive user experience, albeit with some areas needing to be improved. Some players had their progress halted by confusing explanations the vertical slice gave to them. One possible solution proposed was simplify the explanations of the various aspects of the game, especially in the last section of the vertical slice, where most of these issues appeared. In general, the usability playtesting showed that the vertical slice version of the video game caught the interest of hearing individuals that is outside the target audience."

Keywords: User Playtesting, Engagement, Vertical Slice.

Interface UX: Evaluating the gameplay experience in an educational game
Ana Dos Santos, Catarina Matias and Lília Marcelino

“The current study was conducted for the User Experience curricular unit by two students of the Videogames course at Lusófona University, Portugal. The present work aims to evaluate a vertical slice version of the educational video game Otherworld Math to obtain players’ reactions regarding the games' capability of exposing information through its interface. Four participants participated in the study with 11, 16, 18, and 26 years old. The design problems noted by observers and players’ feedback are based on the game’s way of exposing information through its interface which interferes with the player’s gaming experience. Proposed solutions are presented to improve the playability.”

Keywords: Game User Experience, Educational video game, Engagement.

CoArt: Mimicking Paleolithic Engraving
José Gabriel Lopes and Bárbara Barroso

“CoArt is a digital game under development in a co-creation process with the Côa Museum, to promote knowledge of palaeolithic art heritage present in the Vale do Côa region of Portugal. One of the project’s aims is to enable the player to experiment with techniques and art motifs connected to this heritage. For this purpose, the game offers the player an engraving mode. This poster briefly expands on the mechanics and gameplay being designed for this effect.”

Keywords: Virtual Heritage, Serious Games, Palaeolithic, Côa Valley.

Steel, wires and human flesh: a short real time film production using cad tools
Rafael Bicalho and Lucas Gonçalves

“Eruption, the short film is about a new experimentation with realities inside a facility, as the computers take on the lead the results are quite unexpected” This is the synopsis of the short film made in real-time inside Marmoset Toolbag.”

Keywords: Short Film, Science Fiction, 3D Modelling, CAD.

Nameless & Ustráfika: hardsurface character modelling for videogames using CAD tools
Rafael Bicalho and Lucas Gonçalves

“This poster elaborates on the creative process and production of two 3D characters and their respective sample scenes, made for real time rendering, specifically for video games. The main difference in this design and modelling workflow is the utilisation of CAD-style tools for the character models. Such tools may provide flexibility, ease of use and a low polygon count, which make them ideal for a real time rendering pipeline, and works exceptionally well for hard-surface characters, like the ones shown in this work.”

Keywords: Character creation, Hard surface modeling, concept art.

The Bear's Suffering
Gabriel Dias Maia and Magda Rezende de Oliveira

“This work was created with the aim of studying the entire workflow of a Character Artist for games. This requires a complete understanding of all steps to create an attractive 3D model using the industry's most current software and workflow. Starting from the creation of the High Poly model, and its entire process up to the Low Poly game model.”

Keywords: Character Artist, 3D model, Software, Workflow.

!NTERACT!VE

Interactive chairs:
Carlos Casimiro Costa (PT) & Tanja Korhonen (FI) & Jeferson Valadares (PT / BR)

27 November (Friday)
17h00 Interactive session 1

Message Across: A word matching game for reward-based in-game behavior change
Samuel Gomes, Tomás Alves, João Dias and Carlos Martinho

“Even though several research previously assessed human decision making through games, it is crucial to understand what influences players to commit certain choices. This paper presents a local two player word-matching game named Message Across, designed to allow both collaborative and competitive in-game behaviors, and study how to mediate different behaviors solely through the scoring system.”

Keywords: Message Across, Word-matching Game, In-game Behaviors.

Candy Loft VR Experience
Gustavo Correa and Lucas Gonçalves

“Given that real estate developers currently have a considerable financial cost building decorated apartments prior to condominium construction, research is being done into the development of interactive virtual reality mockups to encourage the customer to visit the apartment virtually, reducing or eliminating the costs of building a decorated one. This requires a comfortable, natural and believable experience, with total immersion of the viewer in a virtual environment simulating reality. Research is then conducted on which software and hardware is best for this purpose and make a product that meets this goal. On that aspect, it appears that virtual reality, coupled with real-time rendering has a great power to innovate the real estate industry, offering its customers, from anywhere, the possibility of an immersive and interactive virtual experience to meet apartments that still were not built, without the need to travel to the physical site. As a result, technologies such as virtual reality and real-time rendering are tools with the power to revolutionize markets, and can directly or indirectly impact people's life quality, deserving to be studied and explored in all aspects.”

Keywords: Virtual Reality, Unreal Engine, Architectural Visualization, Real Time Rendering.

28 November (Saturday)
17h00 Interactive session 2

Otherworldly Math
Andreas Melo, Fernando Soares, José Carlos Neves, Conceição Costa, João Frade, Guilherme Saturno, Lília Marcelino and Carlos Santos

“Otherworldly Math is an inclusive research-based educational videogame designed for Deaf and Hard-of-hearing children, being developed under the project GBL4deaf financed by National and European Institutions. In Otherworldly Math the player controls the Commander, a character in charge of building a space base on another planet. In order to obtain the necessary resources, the player must f irst build the production plants and then solve challenges inside each of those. By doing that, the player is able to build new production p lants and upgrade the existing ones, increasing the resource output. In each production plant one or two mathematical competencies can be improved and, by repeating the necessary actions to obtain the required number of resources, the player develops mathematical dexterity in those areas. Real-time feed-back guides the player through the learning activities, which are integrated intrinsically on the playability. The player uses math skills to solve challenges that emerge organically f rom the game world and is rewarded with resources that allow progression through the game challenges, as well in acquiring more complex math knowledge. In Otherworldly Math failure is an opportunity to play again, therefore, to learn.”

Keywords: Accessibility, Game Design, Game Development, Game Based Learning, Deaf Children.

Borderline
Sofia Santos and Patrícia Gouveia

“In borderline, you play as a little cube going for a peculiar walk that will make you face questions of being with yourself and with others. These questions address the feelings of the borderline mental disorder, creating sensations of doubt and emptiness. The soundtrack and animations that accompany the journey will immerse you in an environment of discomfort and confusion that is, at the same time calm, and reassuring.”

Keywords: Art Game, Exploration, Mental Disorder, Serious Games.

PAPERS

Scientific chairs:
Bárbara Barroso (PT) & Licínio Roque (PT)

27 November (Friday)
11h00 Paper session 1: COMMUNITIES

Esports Sponsorships: The Double-Edged Sword Effect of Having a Very Vocal Audience
Bruno Freitas, Ruth Contreras-Espinosa and Pedro Correia

"Esports fans have been known for being heavy consumers of competitive gaming content and for being digital natives who love to comment about esports on numerous social platforms. This has attracted various sponsors interested in capitalizing in this social buzz. However, there have been signs that this high vocality can in fact heavily damage several sponsors. Hence, this research aimed to determine if esports fans' high vocality is a benefit and/or a risk to these sponsors. To achieve this, we adopted a qualitative exploratory design to interview, via digital platforms, 10 esports sponsorship experts. In total, we interviewed two endemic and three non-endemic esports sponsors and five marketing agencies with experience in esports sponsorships. They were sampled via a nonprobability purposive heterogeneous method and were reached via the companies' website contact sections. Data were analyzed with the assistance of NVivo 10. The overall results showed that all experts agreed that this high vocality can both benefit and damage esports sponsors. The uniformity in the answers showed that this element is not a greater benefit or risk to a particular type of esports sponsor. Ergo we considered that the high vocality of esports fans is a double-edged sword. This study is necessary because, despite esports' massive growth, this field has received scant scientific attention, with the specific areas of esports marketing and esports sponsorships being even more severely overlooked. Besides, from a business standpoint, the findings are highly significant for every sponsor looking to better comprehend esports and its fanbase."

Keywords: Esports, Sponsorships, Consumer behavior, Market analysis, Marketing.

“Community” in video game communities
Lucinda Saldanha, Sofia Silva and Pedro Ferreira

“The concept and experience of community has been changing in contemporary societies, from a traditional and classical concept of an idealistic and homogeneous context, characterized by union and “feeling of communitas”, to the exploration and experience of new forms of organization and participation. In this context, video game communities have emerged with specific characteristics and dynamics, that can help us to better understand the importance of game cultures. Based on an ethnographic study of 5 game jams and including data from 8 focus group discussions with game jam participants, this study explores 5 analytic and emerging dimensions of the experience and perception of the video game (VG) community: Meanings and perceptions associated with the VG community; feelings of belonging to the VG community; issues of access in the VG community; structure and organization of the VG community; and contexts of participation in the VG community. These results further our understanding of the ways participants in VG communities can be seen as creators of game culture, and how VG communities are recreating the concept and experience of community in contemporary societies.”

Keywords: Video Game Communities; Sense of Community; Game Culture.

It’s Crunch Time: Burnout, Job Demands and Job Resources in Game Developers
Joana Mendes and Cristina Queirós

“Although game development is a recent profession, many of its issues have been associated with the straining working conditions experienced by workers to keep themselves in the industry. This requires balancing job demands and job resources, and, in cases of extreme and prevalent job demands, it can elicit burnout as an occupational phenomenon. This study aims to identify burnout and job demand-resources levels among game developers, their relationship, and variation according to social individual/labour characteristics. An online questionnaire collected data from 193 game developers. Regarding burnout, results showed moderate levels of exhaustion and disengagement, while job demands revealed high levels of mental and concentration demands, moderate levels of time, emotional, material, and physical demands. For job resources, we found high levels of autonomy and moderate values of personal development, quality of personal relations, ethical, and social utility of work. Exhaustion is positively correlated with working hours per week and job demands, and negatively with job resources. The same happens with disengagement, except for mental and concentration demands. Time demands explained 27% of exhaustion, and personal development explained 14% of exhaustion and 51% of disengagement. Therefore, game developers face very demanding work conditions, alerting to the need to develop strategies for burnout prevention, and for the adequate manage of job demands using job resources, thus, promoting happier and healthier workplaces.”

Keywords: Burnout, Job demand-resources, Game Developers.

14h00 Paper session 2: CHARACTERS

Reward-Mediated Individual and Altruistic Behavior
Samuel Gomes, Tomás Alves, João Dias and Carlos Martinho

“Recent research has taken a particular interest in observing the dynamics between individual and altruistic behavior. This is a commonly approached problem when reasoning about social dilemmas, which have a plethora of real-world counterparts in the fields of education, health, and economics. Weighing how incentives influence in-game behavior, our study examines individual and altruistic interactions in the context of a game task, by analyzing the players' strategies and interaction motives when facing diferent reward attribution functions. Consequently, a model for interaction motives is proposed, with the premise that the motives for interactions can be defned as a continuous space, ranging from self-oriented (associated with individual behaviors) to others-oriented (associated with altruistic behaviors). To evaluate the promotion of individual and altruistic behavior, we leverage Message Across, an in-loco two-player videogame with adaptable score attribution systems. We conducted a user testing phase (N = 66) to verify to what extent individual and altruistic score functions led players to vary their strategies and interaction motives orientations. Our results indicate that both of these metrics varied signifcantly and according to our expectations, leading us to believe in the suitability of applying an incentive-based strategy to moderate the emergence of in-game behavior perceivable as individual or altruistic.”

Keywords: Interaction Style, Reward System, Message Across, Serious Games, Behavior Promotion.

Interviewing a Virtual Suspect: conversational game characters using Alexa
Gonçalo Baptista, Diogo Rato and Rui Prada

”The video game industry is constantly innovating, with new mediums and ways for players to interact with the game environment. Voice interaction in games is an ever evolving field, especially with advances in Natural Language Processing. In that vein, there has been a increasing number of conversational agents with natural language interaction capabilities deployed into video games. In this paper, we improve the Virtual Suspect game with a natural language interaction using the tools provided by Amazon Alexa. We followed an iterative, user-centered approach when designing the new interaction, collecting feedback and data from three User Studies in order to improve the interaction with the Virtual Suspect.

Our findings suggest that the usage of natural language to support the interaction with game characters can improve the player experience."

Keywords: Conversational Agents, Voice Games, Interactive Narrative.

Character Progression for Asymmetric Play
Abel Neto, Pedro Cardoso and Miguel Carvalhais

"Character progression is a common feature in games. While its origins date back to tabletop role-playing games such as Dungeons and Dragons (1974), this is now a feature implemented across diverse game genres. This is widely attributed to the fact that character progression raises engagement, as players build up their commitment to their characters while making strategic choices of how to improve them. In this study, we propose that character progression is also a tool for increasing asymmetry in the different players' experiences through the game. The use of character progression as a tool to generate asymmetry may bring advantages and pitfalls related to asymmetric gameplay. As such, it is important to analyze how character progression can be used to create asymmetric player experiences. This work offers a deconstruction and analysis of current systems of character progression and how they generate asymmetry. This work can be useful for game designers in the discussion and development of systems of progression that reap the benefits of asymmetry while avoiding its risks."

Keywords: Video Games, Character Progression, Asymmetric Gameplay, Game Design.

15h00 Paper session 3: TECHNOLOGY 1

Procedural Game Level Generation by Joining Geometry with Hand-Placed Connectors
Rafael Castro e Silva, Nuno Fachada, Nélio Codices and Diogo de Andrade

"We present a method for procedural generation of 3D levels based on a system of connectors with pins and human-made pieces of geometry. The method avoids size limitations and layout constraints, while offering the level designer a high degree of control over the generated maps. The proposed approach was originally developed for and tested on a multiplayer shooter game, nonetheless being sufficiently general to be useful for other types of game, as demonstrated by a number of additional

experiments. The method can be used as both a level design and level creation tool, opening the door for quality map creation in a fraction of the time of a fully human-based approach."

Keywords: Procedural content generation, Video games, 3D levels, Gridless generation, Mixed-initiative content creation.

SimpAI: Evolutionary Heuristics for the ColorShapeLinks Board Game Competition
Pedro M. A. Fernandes, Pedro M. A. Inácio, Hugo Feliciano and Nuno Fachada

"We present SimpAI, an AI agent created for the ColorShapeLinks competition, based on an arbitrarily sized version of the Simplexity board game. The agent uses a highly efficient parallelized Minimax-type search, with an heuristic function composed of several partial heuristics, the balance of which was optimized with an evolutionary algorithm. SimpAI was the runner-up in the competition's most challenging session, which required an AI agent with good adaptation capabilities."

Keywords: Board games, Artificial intelligence, Evolutionary heuristics, Simplexity, ColorShapeLinks.

Magical Board Theatre: interactive stories that can be played on multiple boards - two educational prototypes.
Demetrius Lacet, Filipe Penicheiro and Leonel Morgado

"Interactive storytelling uses in education are limited by the time required for its production and the ephemeral nature of interaction systems, leading interactive stories to have a short usefulness life. We have developed the concept of platform-independent interactive stories, called virtual choreographies, enabling interactive stories to be replayed on novel technological platforms as they emerge, tackling the second half of this problem. The first part was also approached via a graphical storyboarding approach. Both aspects have been prototyped in a demonstration, called Magical Board Theatre ("Teatro de Tabuleiro Mágico", original Portuguese name). We present this prototype, including its storyboarding tool, summarize the virtual choreographies ap-proach, and demonstrate how the prototype operationalizes them with story and platform examples."

Keywords: Board games, digital storytelling, xAPI, interactive storytelling, virtual choreographies, multiplatform.

16h00 Paper session 4: MEDIA & INDUSTRY

Recent trends in the Portuguese video game industry: 2016-2020
Flávio Nunes, Pedro Santos, Patrícia Romeiro and Camila Pinto

“The Atlas of the Video Game Industry in Portugal published its second edition in 2020, with the main goal of mapping, characterizing, and analyzing the evolution of the video game industry on a national scale. This paper presents information on the current situation and recent trends (2016-2020) in the video game sector in Portugal (companies, employment, products, economic and financial situation, networks, and public support), as well as the main expectations regarding the development of this industry in the national context. Methodologically, the video game sector is characterized based on the collection and analysis of original data from a survey conducted with video game companies and independent creators, which develop activities in Portugal.”

Keywords: Video Game Industry, Mapping, Innovation, Creative Industries, Public Policies, Portugal.

Video games specialized media in Basque language
Maitane Junguitu Dronda

“This paper analyzes the situation of video game specialized media specific to Basque language. We focus not only on the available offerings in Basque language, but also on the informative demands of the video game consumers from the Basque Country. This research is set in the context of regional or minority languages in Europe and helps to draw the current situation of media in places that struggle to maintain their own identity and culture. First, we describe the specialized media in Spain. We explain the historical development of magazines and how video games reached the traditional media. Then, we take a general look at the specialized media in Basque language taking into account the sociolinguistic characteristics of the Basque society. As a case of study for video games, we analyze the blog of the video games Association Game Erauntsia. The next step is to study the demand of Basque speaking video game fans regarding their need to be informed. The data is interpreted after the survey conducted to members of the Game Erauntsia community.
Considering the demands and the offer of specialized media, we bring up some conclusions that set new guidelines to fulfill the needs of the audience.”

Keywords: Gaming culture, Specialized media, Basque.

Built for communication: a strategic perspective of digital games in health

Susana Lamas, Nelson Zagalo and Helena Sousa

“In health promotion, public communication campaigns have been used to promote the adoption of appropriate behaviors, or the prevention/ cessation of health risk behaviors [1]. They are the result of marketing activities by health organizations (including research and government institutions), as part of a strategic communication [2]. Serious games have a relevant role in the media mix used in public communication campaigns [3]. They are seen with such a potential that attract strong public and private investments to their development. But although serious games can take part of campaigns, in reality they have different origins and intentions from this strategy tool, underlined by their own specific theoretical frameworks in game design and game studies. The attraction and engagement they exert on players, make them promising tools for communication and mobilization. Their theoretical undefinition, the extent and diversity of serious games, and the permanent search for new kinds of games, make them flexible tools from a strategic point of view [4-6]. In this paper, by analyzing a sample of Games for Change (G4C) in health (concerning their objectives and effects) when compared to the traditional information/ communication campaigns, we identified expressive differences and advantages in serious games. G4C tend to be less persuasive, more focused on social changes, and embrace different forms of inbuilt communication, which bring flexibility in the sense of communication, and player´s participation on it. In concrete, we have identified: interactive, biofeedback, data and ritual/ artistic forms of communication.”

Keywords: Strategic communication, Campaigns, Health, Serious games, Participation, Interactivity, Inbuilt communication.

28 November (Saturday)
11h00 Paper session 5: GAME BASED LEARNING

Game Based Learning in Science Fiction
Néstor Jaimen Lamas

“In the following paper, three different science fiction scenarios in which pedagogy and video games meet will be analyzed, considering the aforementioned genre not only as entertainment, but also as an experimental and technoscientific laboratory. In these narratives, different problems will be analyzed with which to approach Game Based Learning in relation with psychometrics, behaviorism and non-directive pedagogies.”

Keywords: Game Based Education, Pedagogy, Science Fiction, Video games.

Supporting the construction of game narratives using a toolkit to game design
Pedro Beça, Cláudia Ortet, Mónica Aresta, Rita Santos, Ana Veloso and Sofia Ribeiro

“Students are being more often challenged not only to play but also to create games when there is increasing evidence of the impact, in terms of learning, of students' involvement in creating their own games centred on educational content. Nevertheless, the game making process has certain specificities that are not usually recognized by the public but are relevant to create good games. Taking this into consideration, the Gamers4Nature project developed a Toolkit to Game Design to support users, with and without previous experience, during a game creation process. This paper focus on the analysis of undergraduate students’ engagement using the Toolkit through the creation of game narratives focused on environmental preservation. A total of 46 undergraduate students (from a Social Sciences (non-ICT course) participated in 2-hours game narrative design sessions, using the Toolkit’s resources to develop their game’s narrative. As a result, 14 game narratives were created. Participants considered the Toolkit easy to use, not having preponderant usability issues. Although additional tests are still needed, namely with larger and diversified groups, preliminary results indicate that the Toolkit is a resource capable of assisting users with no previous experience during the game design process, namely in the writing of game’s narratives.”

Keywords: Toolkit, Game Design, Narratives, Digital Games, Environmental Awareness.

Borderline: Games and Activism
Sofia S. Santos and Patrícia Gouveia

“This article explores digital games as media through which activism exists. We highlight several works, which in parallel with certain games, show that authors are working on themes of social and political matters. We review the role of game designer Will Wright, and his creation of games like The Sims (EA, 2000_) and Spore (EA, 2008). It is also shown, in association with these games, the concept of mods and their role in creating communities based on identical beliefs and also enhancing the skills of the player. In this paper we will analyze activism in gaming experiences, serious games, and LGBT inclusion in playful environments. Finally, we present a game named borderline, which aims to bring up our main research question: can an interactive experience contribute to generate awareness about social issues?”

Keywords: Games, Activism, Mods, Serious Games.

12h00 Paper session 6: ACESSIBILITY

Macguffin: Reimagining Pac-Man to encourage inclusion and reduce stigma associated with visually impaired people
Dinis Enes, Lívia Lopes, Frederico Oliveira, Pedro Cardoso and Bruno Giesteira

“The implementation of Universal Design in our daily lives is raising awareness and changing behaviours with the purpose of being inclusive towards people who suffer some type of disability. In this paper, we explore how to make games inclusive for visually impaired people. To achieve this, we’ve created a remake of Pac-Man (1980) called MacGuffin. We resorted to co-design sessions to identify challenges visually impaired individuals face when playing video games and to find ways to mitigate them when designing these. Co-design sessions and navigation efficiency tests were accomplished to improve mechanics and implement features like haptic feedback. Results show some areas like sound effects, interface and the tutorial need further work, with participants showing interest in the development of a physical device. The creation of MacGuffin shows that games like Pac-Man can be inclusive and accessible using Universal Design, while providing hints for the design of inclusive games.”

Keywords: Accessibility, Game Design, Universal Design, Visually Impaired.

Conducting a Usability Playtest of a Mathematics Educational Game with Deaf and Hearing Students
Lília Marcelino, Conceição Costa, Andreas Melo and Fernando M. Soares

“In this paper, a usability playtest to a pre-Alfa version of "Name of video game" is presented with a focus on understanding, usability, and player experience based on the four-layer model from Player Research. The main goal of the present study is to improve learning and the game experience of a mathe-matics research-based educational video game with the application of a usability playtesting. The participants are deaf and hearing children (n = 9), four deaf stu-dents and five hearing students, aged between 10 and 14, five girls and four boys. Four instruments were applied via Zoom platform: a) a pre-test, to collect players' video games preference; b) a post-test to gather participants' self-report on diffi-culties they may found in-game; c) an observational grid for researchers; and d) an emotional scale to assess the intensity of emotions felt by the players in-game. The main results show that deaf and hearing children felt "very" satisfied and "a little" confused during gameplay. It was found that both groups found the same barriers: a) the objectives of challenge 2 were not understandable; b) a user inter-face icon meaning is ambiguous in challenge 3; and c) players expect more ex-ploration in every challenge. A new level design and a new game layout were developed to fix the problems found in challenge 2. The usability problem re-lated with challenge 3 demanded icon redesign. In what relates to the playability issue mentioned in c) the solution points towards a game design review to balance the learning objectives with playability.”

Keywords: Research-based Educational Games, Deaf Students, Games User Research, Usability Playtest.

14h00 Paper session 7: DESIGN & DEVELOPMENT

Shaping User Profiles after First User Validation: Reflections on the Findings of the Prototyping Process of a VR Bird Watching Tour in Lima, Perú
Fiorella Carhuancho Quijada

“User Personas have long been used to start creating a design project because it helps the designer understand the end user. However, there is a lack of information and case studies that show how often designers are faced to the problem of what they thought would be the solution is not working as planned when the product is implemented. The aim of this

paper is to reflect on how the designer perspective can evolve since the begging of the design process where the user is identified and described until the prototyping and testing with real users. To reflect on this gap the case study of the Work in Progress of VR birdwatching tour in Lima, Perú is presented. Literature review, interviews, participant and not participant observations were conducted during the conceptualization stage of the project and then the prototype was elaborated to validate it. Results show that, whereas planning for an ideal user is useful at the beginning, it is necessary to contrast these profiles with actual users because they can vary greatly during the interaction with the product and the specific context they are applied to."

Keywords: HCI, User Personas, Prototyping methodology, VR, Ecotourism.

Ollie's Escape
João Sernadela and Rui Pedro Lopes

"Nowadays, the gaming industry it's a major economic sector with a large monetary worth and exponential world demand. Regarding such, one of the eminent causes to this fact is, without a doubt, the entertainment that games can provide to different people of different age groups. However, with high demand and variety of games already in place on the market, it is becoming more and more difficult to design something that differs and highlights from mainstream games. For that to happen, innovation and creativity are required, given the target audience. Thus, in this article, it is intended to describe in detail the development process of Ollie's Escape, an animated 3-dimensional game (3D) inserted in the thematic of "escape game", made in Unreal Engine 4 (UE4). So, described in this article are the results of all the relevant aspects associated to the development of the project, such as: creation, modelling and animation of characters and objects, level design and programming in UE4's Blueprints, as well as the implementation of all the features carried out. The final results were quite satisfactory, where all the proposed objectives were accomplished, attaining a positive feedback."

Keywords: Escape game, Ollie's Escape, 3-dimensional, Unreal Engine 4.

15h00 Paper session 8: TECHNOLOGY 2

Reinforcement Learning in Tower Defense
Augusto Dias, Juliano Foleiss and Rui Pedro Lopes

“Reinforcement learning is a machine learning technique that makes a decision based on a sequence of actions. This allows changing a game agent's behavior through feedback, such as rewards or penalties for they actions. Recent work has been demonstrating the use of reinforcement learning to train agents capable of playing electronic games and obtain scores even higher than professional human players. These intelligent agents can also assume other roles, such as creating more complex challenges to players, improving the ambiance of more complex interactive games and even testing the behavior of players when the game is in development. Some literature has been using a deep learning technique to process an image of the game. This is known as the deep Q network and is used to create an intermediate representation and then process it by layers of neural network. This layers are capable of mapping game situations into actions that aim to maximize a reward over time. However, this method is not feasible in modern games, rendered in high resolution with an increasing frame rate. In addition, this method does not work for training agents who are not shown on the screen. In this work we propose a reinforcement learning pipeline based on neural networks, whose input is metadata, selected directly in the game state, and the actions are mapped directly into high-level actions by the agent. We propose this architecture for a tower defense player agent, a real time strategy game whose agent is not represented on the screen directly.”

Keywords: Reinforcement learning, Artificial intelligence, Neural network, Tower Defense.

Playfully probing practice-automation dialectics in designing new ML-tools

Jorge Ribeiro and Licínio Roque

“Aircraft maintenance is a complex domain, where organizational practices and system changes are rare and require new practices to slowly evolve. In the context of creating a planning tool for Condition-Based Maintenance in Aircraft Maintenance Planning (AMP), authors were faced with the challenge of designing for a not-yet present culture. In this context we introduce domain language and procedures and discuss the use of play probes as a cultural probing technique, to enable a dialectics between experiential development of new planning practices while facilitating cooperative design of a new tool.”

Keywords: Play Probes, Cultural Probes, Paper Prototype, Playful, Maintenance, CBM, Machine Learning.