Media, Arts & Design | AI Conference 2020

Media, arts, design and artificial intelligence have always had a great influence on each other. For example, it is the great science fiction novels and films such as "2001: A Space Odyssey" that have shaped the perception of artificial intelligence for generations. On the other hand, it is now AI-supported media productions that allow us to dive into our film and game worlds and turn them into the great experiences we enjoy as consumers.

The Media, Arts & Design | AI 2020 conference is now to become a sister conference to the Media, Arts & Design | blockchain series. The declared goal is to connect the art and cultural communities with the technical scene.

The conference takes place June 19th, 2020, 14:00 – 20:00 (CEST / UTC+2) via ZOOM (the link will be sent to all registered participants on June 18th.)

UTC +2	Name	Topic	Abstract
01:00 pm – 01:20 pm LOGIN TO THE ZOOM SESSION			
01:20 pm – 01:25 pm	Alexander Pfeiffer	WELCOME WORDS	
01:25 pm – 01:40 pm Introduction of the consortium	Natalie Denk Alexander Pfeiffer Scot Osterweil Michael Wagner Nicholas Jushchyshyn Alexiei Dingli Mark Bugeja Stephen Bezzina Tanja Shivonen Alesja Serada André Thomas	Center for Applied Game Studies @ Donau-Universität Krems the MIT Education Arcade @ Massachusetts Institute of Technology Antoinette Westphal College of Media, Arts & Design @Drexel University Department for AI @ University of Malta Department of Communication Studies @ University of Vaasa. LIVE LAB @ Texas A&M University	
01:40 pm – 02:10 pm	Alexiei Dingli	OPENING KEYNOTE: Museums and the Web - A femme fatale relationship?	*1
02:10 pm – 02:30 pm	Alexander Pfeiffer	Cheaters, Make Believers or Intelligent Opponents? About the History of AI in Digital Entertainment Media.	*2
02:30 pm – 02:50 pm	Agnes Karolina Bakk	AI as the Illusion of Intelligence in Video Games.	*3

02:50 pm – 03:10 pm	Nikolaus Koenig	Artificiality, superficiality, and the appearance of intelligence. Considerations from a play theoretical and (media) ethical perspective.	*4
03:10 pm – 03:30 pm	Wilfried Elmenreich	INVITED KEYNOTE: Retrocomputing as Inspiration for Designing Games.	*5
03:30 pm – 04:00 pm	Klaus Neundlinger Michael Mühlegger Simone Kriglstein	SELECTED KEYNOTE: Training social skills in Virtual Reality – insights from applying conversational AI in an interactive office scene.	*6
04:00 pm – 04:20 pm	André Thomas	Game-Based learning and the use of AI to create deeper learning experiences.	*7
04:20 pm – 04:40 pm	Mark Bugeja	Playfully Learning by Imitation	*8
04:40 pm – 05:00pm	Lloyd Donelan Brenton Lenzen	Applications of AI in Game-Based Learning: Creating Adaptive Learning Experiences.	*9
05:00 pm – 05:20pm	Russell Sammut-Bonnici Chantelle Saliba Giulia Elena Caligari	Reinforcement Learning for Snake.	*10
05:20 pm – 05:40 pm	Ralph Möller Markus Heiss	CoverZone – Development of a game-AI from pen-and-paper to C# / Unity.	*11
05:40 pm – 06:10 pm	Giulia Taurino	SELECTED KEYNOTE: The Brokenness in our Recommendation Systems: computational art for an ethical use of A.I..	*12
06:10 pm – 06:30 pm	Adnan Hadzi	Algorithms, Ethics & Justice.	*13

06:30 pm – 06:50 pm	Alesja Serada	Melancholy and Depression in Robots: Robot Verter vs. Marvin the Paranoid Android.	*14
06:50 pm – 07:20 pm	Alexander Seewald	INVITED KEYNOTE: A Short Illustrated Past, Present and Future of Artificial Intelligence.	*15
07:20 pm – 07:40 pm	Christopher Noessel	Untold AI.	*16
07:40 pm – 08:00 pm	Merve Sahin	Tracing the History and Theory of Conceptual Art and Technology: the Case Study on Harold Cohen	*17
08:00 pm – 08:20 pm	Patrik Lechner	Neural Networks as Effects in Feedback loops for novel Audio Effects.	*18
08:20 pm – 08:40 pm	Bryan Ogden	Character design and AI.	*19
08:40 pm – 09:00 pm	Gianfranco Siracusa Dylan Seychell	Applying generative adversarial networks to texturing 2d aerial town maps for roleplaying games.	*20
09:00 pm – 09:20 pm	Ruth Bugeja	The Impact of AI on the Replayability of Interactive Digital Narratives.	*21
09:20 pm – 09:30 pm	Gabriel Camilleri Jake Seracino David Vella Jacob Cassar Ellis	Evaluating AI Agents to solve the Blackjack problem.	*22
09:30 pm till last participant standing	Everyone	**The last spilled drink of the evening (applied research):** Do our digital agents need control? Should we issue them digital identities linked to those of the admins or legal owners? Should we record all the actions of the AIs and if so, how? On Blockchain? A moderated discussion by Alexander Pfeiffer, Mark Bugeja and Alesja Serada, in which everyone is welcome to put a drink to their notebook so that we can raise a toast. The conference will then be evaluated informally and ideas for 2021 will be collected. Small break-out rooms for private networking are also available.	*23

BLOG OF ABSTRACTS:

*1: Museums and the Web - A femme fatale relationship?

 Alexiei Dingli | University of Malta; Donau-Universität Krems

The tech-industry underwent a massive revolution after the dot-com bubble burst. The tragic crash in worldwide markets caused internet gurus to do some soul searching and come up with patterns which were working before the crash and which continued to thrive afterwards. This is commonly referred to as Web 2.0. Fast-forward 20 years later and the world is once again on its knees due to the pandemic. During these past months, we have experienced the closure of most Museums worldwide. This caught many of them unprepared with consequences that museums are still struggling with. The talk will look at the issues afflicting these institutions and create an analogy between what happened two decades ago, what we learnt from those situations and how we can adopt them in the new world we're living in. By doing so, we will identify patterns which will define what makes an online Museum experience successful. They will establish a blueprint for the Museums of the future which make extensive use of technology and Artificial Intelligence. It will help them look at themselves from a new perspective. They will be based around the needs of the users; the personalisation of the museum experience while also bringing together different communities of people who share common interests. Such Museums will not only thrive in the world of today but will be ready to embrace and conquer the challenges of tomorrow.

*2: Cheaters, Make Believers or Intelligent Opponents? About the History of AI in (Digital) Entertainment Media.

Alexander Pfeiffer | Massachusetts Institute of Technology; Donau-Universität Krems; University of Malta

Artificial intelligence, or at least illusory artificial intelligence and digital computer games have a long tradition. In Mario Kart, the opponents in the rear positions always get the best items. In Civilisation the opponent has new strong units out of the nothing, although this should not be possible. Furthermore the peaceful Ghandi suddenly attacks with nuclear weapons from nowhere. Elli in "The Last of Us" seeks the protection of the player very realistically while being controlled by the computer. All this is made possible by more or less well done programming tricks. But then DeepMind comes into play, the AI known from chess learns to play Starcraft and prevails against the best human opponents. No cheating, no tricks at all. This contribution is intended to lead through the history of AI and digital games, highlighting the most important events and encouraging discussion.

*3: AI as the Illusion of Intelligence in Video Games.

Agnes Karolina | Moholy-Nagy University of Art and Design Budapest

In the past years, the science of magic started to get more attention in pursuit of finding a new approach for studying various functions and processes of the mind (see Rensink and Kuhn 2015) and it also started to be discovered by human-computer interaction and game design researchers (see Tognazzini 1993 and Kumari, Deterding and Kuhn 2018). Researchers such as Kuhn (2018) have taken up the idea that we can use the science of magic to study different complexities such as video games. The use of AI in designing video games can offer a sense of intelligence in video games. Such

mechanics can be observed in the design of procedural worlds (for instance in No Man's Sky), and with the help of these mechanics and by using these narrative environments these games are able to create a sense of astonishment and magic in the player. Psychology of magic can offer also other types of mechanics that can be used in video game design by implementing AI tools. Other design frameworks that can be used in video games with the help of AI are perceptual causality, which can be implemented to create believable worlds and also to enable the player to have the feeling of the freedom of choice while still maintaining a challenge to the player's problem solving strategies. In this talk I will present this „magical" toolkit and I will point out the importance of these tools by using examples from The Legend of Zelda and Red Dead Redemption 2.

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*4: Artificiality, superficiality, and the appearance of intelligence. Considerations from a play theoretical and (media) ethical perspective.

Nikolaus König | Donau-Universität Krems

Rather than focusing on the concept of 'artificial intelligence' in the stricter sense, the aim of the talk is to draw on a range of different theoretical concepts in order to provide fresh perspectives on the AI discourse. The talk will put the concept of 'intelligence' in the context of play from a theoretical perspective by focusing on the desire and strategies to 'appear intelligent', and how these can be translated to machines. Roger Caillois' mimicry be used to distinguish between intelligent action and intelligent decision, between behavior and thinking. Based on this distinction, ethical considerations will be made regarding the importance of making this distinction especially when creating artificial mechanisms of action and/or decision, and regarding the role superficial intelligence plays in contemporary media discourses. The motif of creator and creation in mythology and art will be used to briefly discuss questions of self and other, inside and outside view, from a radical constructivist view point, and related to the concepts of Intelligence, control and responsibility in democratic societies.

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*5: Retrocomputing as Inspiration for Designing Games.

Wilfried Elmenreich | Alpen-Adria-Universität Klagenfurt

Retrocomputing is the use of old computer hardware and software in modern times. This usually comes with severe restrictions in memory, graphical features, sound, and processing speed. On the other hand, adhering to these restrictions can be a powerful source of inspiration for game design. Despite being of limited commercial value, creating retrocomputing games in the modern world can be of educational value as well as an art on its own. In this talk, we take a deep dive into computer systems of the early 80ies to understand their capabilities and limitations and investigate the tools used today to create real retro games for systems such as the legendary Commodore C64. While the limited hardware possibilities force a designer to use game features resembling those of past computer games, a set of modern cross-development tools, advances in computer algorithms, embedded system development and four decades of game development have formed a unique ecosystem that is strongly different from past and contemporary environments.

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*6: Training social skills in Virtual Reality – insights from applying conversational AI in an interactive office scene.

Klaus Neundlinger | Institute for cultural excellence

Michael Mühlegger | Karl Landsteiner Universität für Gesundheitswissenschaften

Simone Kriglstein | AIT – Austrian Institute of Technology

The Virtual Skills Lab is an ongoing interdisciplinary project involving experts from academic fields such as Human-Computer-Interaction and User Experience research, sociology and psychology as well as practitioners specialized in training and developing corporate culture and learning technology developers. The project (funded by the Austrian research promotion agency FFG) aims at developing Vitrual Reality (VR) scenarios for the training of social skills in the workplace. For this purpose, a scenario was developed in a participatory process together with a group of managers working in an international company. The participants were asked to imagine emotionally difficult situations in their everyday interaction with colleagues. On the basis of this co-creational development of a story line, currently a VR scene is being designed in which users finding themselves in the position of a manager will interact with a fictitious collaborator represented by an avatar. The interaction with the avatar is based on speech recognition and conversational AI technologies.

The presentation aims to share preliminary insights regarding three key aspects:

1) How does our work relate to the state of the field, i.e. to existing solutions on how to model social interaction by combining conversational AI with immersive technologies like VR?

2) What are the major challenges we face with respect to the still limited "spontaneity" in interactions with an AI-based interlocutor in VR?

3) How have these challenges influenced our approach to story-telling? What are our solutions for our first prototype?

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*7: Game-Based learning and the use of AI to create deeper learning experiences.

André Thomas | Texas A&M University

The creation of learning games can be greatly enhanced when using AI, thus allowing designers and content creators more flexibility on tight budgets. The use of AI in learning games can go far beyond creating believable NPC's (non player charcters) and be utilized to enhance the learning experience for the player. In this talk I will look at the different aspects of utilizing AI in both the creation of GBL (Game-Based learning) experiences and the use of learning games.

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*8: Playfully Learning by Imitation.

Mark Bugeja | University of Malta

Artificial intelligence advances have allowed areas of research such as Reinforcement Learning to improve up to such a degree that we are now able to teach learning agents to play games better than humans. Notable examples include work developed by Deep Minds on Alpha Go. Nonetheless, these techniques can outperform humans based on several factors. One undeniable reason is the fact that a human can never take a split-second decision as fast as a machine does, which begs the question, is it fair to compare human play vs machine play? On the other hand, several techniques have also emerged that unlike Reinforcement Learning, these techniques referred to as Imitation Learning, learn through imitating behaviour. Also referred to as Apprenticeship or Inverse Reinforcement Learning, this technique has been used successfully in Self Driving Cars as well as

Games. This talk will feature, advances in the area, together with examples and future work on the possibility of using Imitation Learning to teach agents to play a game like a human. Thus, unlocking huge potential in several areas, including ESports.

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*9: Applications of AI in Game-Based Learning: Creating Adaptive Learning Experiences.

Lloyd Donelan | LIVE LAB @ Texas A&M University
Brenton Lenzen | LIVE LAB @ Texas A&M University

AI is found in many entertainment and edutainment games alike, often non-responsive to user actions which fall beyond the scope of actions anticipated by the game's designers. In the context of game-based learning (GBL), this means that any "intelligent" agent or system within the game can never truly provide a learning experience tailored to a particular student. What if modern advances in AI were used to create truly intelligent agents and game systems, which could adapt to every learners' needs? Adaptive Hypermedia (AH) and Intelligent Tutoring Systems (ITS) could be used to present/teach new information, and then provide additional assistance to the learner in a context-sensitive manner. In this talk, the speakers discuss the concepts behind GBL which make AH and ITS ideal solutions to this problem. Existing research in intelligent GBL will be discussed - most notably Lester et. al.'s Crystal Island, a game which models and reacts to student knowledge using a dynamic bayesian network (Lester 2013), and Bermudez et. al.'s proposed "knowledge discovery framework" for an open-world educational game (Bermudez et. al. 2019).

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*10: Reinforcement Learning for Snake.

Russell Sammut-Bonnici | University of Malta
Chantele Saliba | University of Malta
Giulia Elena Caligar | University of Malta
Mark Bugeja | University of Malta

Reinforcement Learning is a machine learning technique in which an agent interacts with their environment to gather information and make an informed decision based on the accumulated information. This has proven to exceed human performance in video games such as Go and Atari. In this research, we investigate the applicability of various reinforcement learning techniques for Snake, a video game popular the Nokia 3310 mobile phone.

The reinforcement learning techniques; Q-Learning (Quality-Learning), SARSA (State-Action Reward State-Action) and PPO (Proximal Policy Optimization), were implemented and evaluated. It was concluded that Q-Learning and SARSA did not generate optimal results due to the large environment of the game, which required extensive amounts of time for training.

The PPO reinforcement learning technique was implemented with three varying approaches for input; a vector, CNN and raycasting based approach. PPO, in conjunction with raycasting, resulted in the best performance, with the snake agent able to simulate learning for both collecting food and avoiding obstacles. Furthermore, A* Pathfinding was implemented as a non-reinforcement learning technique. It achieved a performance better than Q-Learning and SARSA but was not as successful as PPO due to PPO's adaptability for large environments.

In the future, implementations of artificially intelligent agents for large dynamic game environments may benefit from utilizing the reinforcement learning technique, PPO. In this talk, we present our

findings in detail on applying the various reinforcement learning approaches to Snake, for insight on reinforcement learning for dynamic environments with changing targets and obstacles.

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*11: CoverZone – Development of a game-AI from pen-and-paper to C# / Unity.

Ralph Möller | Center for applied game studies @ Donau-Universität Krems
Markus Heiss | Center for applied game studies @Donau-Universität Krems

A short talk about the development of "CoverZone" - the authors' master thesis game for Applied Game Studies @ Donau University Krems - from pen-and-paper prototype over a simple C#/WPF running demo to a full-scale 3D multi-platform application developed in Unity. Mathematic basics applied to the prototype shall be discussed as well as interface technology; from Visual Studio to Unity.

A central approach when designing the solution was to be able to create the first prototype without any knowledge of 3D development and also only using free tools (although within a commercial scope).

We shall discuss if and how multi-platform development is making sense for a project of such scope and size; with an additional look at native development for several software platforms (if possible - depends on speaker availability).

The latest development is a planned scope shift from PvP/PvC game to puzzle game which calls for a re-thinking of the whole gaming (AI) engine the game is based upon.

As the authors are also the only developers involved in the creation process of CoverZone, the whole process documentation of the development process has been done by the creators themselves.

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*12: The Brokenness in our Recommendation Systems: computational art for an ethical use of A.I..

Giulia Taurino | METALab @ Harvard University

Online recommendation systems are information filtering systems that provide users with streams of prioritized content based on expected individual preferences. While they can be of different types - collaborative, content-based, or hybrid filtering -, they typically share the use of machine learning technologies as forms of artificial intelligence able to perform predictions and profile personal taste. Drawing upon previous research on critical algorithm studies, this presentation tackles the limitations of predictive content personalization and automated sorting. By advocating for the ethical use of A.I., this talk will discuss alternative uses of machine learning, to engage artists, designers, and media practitioners in the creation of context-sensitive algorithms that promote processes of future-making (Montfort 2017). The computational project "This Recommendation System is Broken" will be presented as part of a collaboration carried out with the metaLAB (at) Harvard for the exhibition series "Curatorial A(i)gents", which focuses on the interplay between A.I. and curatorial practices. By leveraging on a conceptual use of programming, this project challenges the audience to explore the biases of machine learning in generating instances of visibility on media platforms. What we might call "brokenness" is therefore ultimately about exploring an ethics of algorithms, one that spreads awareness on how information filtering systems are transforming media cultures.

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*13: Algorithms, Ethics & Justice.

Adnan Hadzi | University of Malta

In order to lay the foundations for a discussion around the argument that the adoption of artificial intelligence (AI) technologies benefits the powerful few, focussing on their own existential concerns, the paper will narrow down the analysis of the argument to social justice and jurisprudence (i.e. the philosophy of law), considering also the historical context. The paper explores the notion of humanised artificial intelligence in order to discuss potential challenges society might face in the future. The paper does not discuss current forms and applications of artificial intelligence, as, so far, there is no AI technology, which is self-conscious and self-aware, being able to deal with emotional and social intelligence. It is a discussion around AI as a speculative hypothetical entity. One could the ask, if such a speculative self-conscious hardware/software system were created at what point could one talk of personhood? And what criteria could there be in order to say an AI system was capable of committing AI crimes?

The paper will discuss the construction of the legal system through the lens of political involvement of what one may want to consider to be powerful elites. Before discussing these aspects the paper will clarify the notion of "powerful elites". In doing so the paper will be demonstrating that it is difficult to prove that the adoption of AI technologies is undertaken in a way which mainly serves a powerful class in society. Nevertheless, analysing the culture around AI technologies with regard to the nature of law with a philosophical and sociological focus enables one to demonstrate a utilitarian and authoritarian trend in the adoption of AI technologies

The paper will then look, in a more detailed manner, into theories analysing the historical and social systematisation, or one may say disposition, of laws, and the impingement of neo-liberal tendencies upon the adoption of AI technologies. The regulatory, self-governing potential of AI algorithms and the justification by authority of the current adoption of AI technologies within civil society will be analysed next. The paper will propose an alternative, some might say practically unattainable, approach to the current legal system by looking into restorative justice for AI crimes, and how the ethics of care, through social contracts, could be applied to AI technologies. In conclusion the paper will discuss affect and humanised artificial intelligence with regards to the emotion of shame, when dealing with AI crimes.

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*14: Melancholy and Depression in Robots: Robot Verter vs. Marvin the Paranoid Android.

Alesja Serada | University of Vaasa

It can be argued that representation of robots and artificial intelligence in the media goes as far as Greek mythology (Latour 1994). While in cybernetics robots are solely rational creations, contesting narratives in literature, film and games often present robotic characters who develop human-like feelings and emotional intelligence. Such representations shape public perceptions of artificial intelligence in general.

In my talk, I will compare two culturally significant fictional artificial beings who came to life in pop culture of the 1970s-80s in the USSR and the UK. Interestingly, both characters project the emotion of sadness, which is even more striking in robots. If humans assume their responsibility for the well-being of artificial beings that they create (Gualeni 2020), then they should consider scenarios when robots become sad, depressed or even suicidal.

I will focus on the case of Robot Verter, an instantly recognizable image in post-Soviet cultural memory. This character originates from the children TV series Visitor from the Future (1985): he develops a strong emotional connection with children and sacrifices himself to save them. This character has broken a number of stereotypes in representation of artificial intelligence (Korosteleva 2019), including the Soviet stereotype of masculinity (Kon 1995). I will compare this character to Marvin the Paranoid Android from The Hitchhiker's Guide to the Galaxy series to find out what would make a robot sad in a fictional world, and why this sadness resonated so much with audiences of respective TV series.

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*15: A Short Illustrated Past, Present and Future of Artificial Intelligence.

Alexander Seewald | Seewald Solutions GmbH

Almost since humans started thinking, they thought about creating artefacts that think as well. The earliest written record of the creation of such an artefact, the Golem, dates around 1630-1650. It is not renowned for its intelligence, however, and easily tricked by its creators. Frankenstein by Mary Shelley described perhaps the first artefact that surpassed its creator in intelligence (not to mention mercifulness), however its base materials were still profoundly biological in nature. The Mechanical Turk was perhaps the first attempt at a completely synthetic artefact of this nature, alas it was most clearly a hoax as Alan Turing so famously deduced.

Only with upcoming computer technology in the early 20th centry and the beginning of the research field of Artificial Intelligence did people start to think about building true artefacts that think with a synthetic structure, arguably a much harder task. Since then countless books, films, short films, series and other media have been created on this topic. But will AI be inferior or superior to us? Will superintelligence be purely technological, purely biological or a combination of both (i.e. cyborg)? How will it look like and how will it act?

In this talk we will use snippts from topic-related films such as Automan, Colossus, D.A.R.Y.L., Ex Machina, Ghost in the Shell, Her, Mark 13, Metropolis, Not Quite Human, Puzzlehead, Short Circuit, Source Code, Terminator, Transcendence, Upgrade, Westworld and others to thread a short past, present and future of Artificial Intelligence as imagined by film and media producers.

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*16: Untold AI.

Christopher Noessel | Scifiinterfaces.com

How do depictions of Artificial Intelligence in popular science fiction affect how we think about real AI and its future? How has fiction about AI influenced the development of AI technology and policy in the real world? (And do we really have to talk about Terminator's Skynet or 2001's Hal 9000 every damned time we talk about the risks of AI?) Join bestselling sci-fi authors Cory Doctorow and Malka Older, scifiinterfaces.com editor Chris Noessel, along with futurism and AI policy experts as they examine what TV, movies, games, and sci-fi literature are telling us about AI, compare those lessons to real-world AI tech & policy, and identify the stories that we should be telling ourselves about AI, but aren't.

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*17: Tracing the History and Theory of Conceptual Art and Technology: the Case Study on Harold Cohen.

Merve Sahin | San Francisco Art Institute

AARON is a computer program designed by the Abstract Expressionist painter Harold Cohen to generate original artworks at the booming time of research on artificial intelligence – namely the post-war era. This thesis creates a case study, examining the career of Cohen to formulate the road he took in relation to the history of conceptual art by working with an artificial language to create visual imagery. The introduction of science and technology into the arts was fundamentally a conceptual work: an idea that was initially coined by Edward A. Shanken with the methodological vocabulary of Jack Burnham. The ontological investigation toward the essentialist notions of formalism led Cohen to find original solutions to the basic problem of painting that is voiced by the influential art critics Michael Fried and Clement Greenberg. Cohen's motivation to learn computer programming, and create AARON gives art history and criticism an example of a post-formalist artist who was investigating conceptual notions through the lenses of art, science, and technology. Cohen is one of a few artists who set the goal to AARON to be an autonomous entity without its creator — the way to that was through teaching the machine to emulate or mimic human behavior. However, teaching a machine drawing and coloring is a non-trivial activity compared to teaching the machine to play chess, due to the action of art-making being a subjective and creative behavior. AARON is a cybernetic artist who can be qualified by having the observable behavior of creativity such that it can learn from mistakes, create a memory of reflection, and produce by itself a new way of art-making.

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*18: Neural Networks as Effects in Feedback loops for novel Audio Effects.

Patrich Lechner | FH St. Pölten

This work proposes the use of different ANN (Artificial Neural Network) structures, such as LSTMs and CNNs for the creation of new audio sonic textures via their placement in a feedback loop. Novel means of artistic expression and navigation of AI generated sounds can be achieved by training an ANN on musical material in order to predict an STFT frame from previous ones and placing the ANN in a feedback loop together with other effects.

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*19: Character design and AI.

Bryan Ogden | Ninjamoba LTD

Compelling character design for AI includes identity visualization, naming, and voicing. Join the project owner and winner of EU VS Virus (the largest hackathon in the world) in the track of remote education and family life for Intelligent Assistant Jop. Bryan Ogden will review the history of and discuss methods for effective character development and personality casting for artificial intelligence agents.

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*20: Applying generative adversarial networks to texturing 2d aerial town maps for roleplaying games.

Gianfranco Siracusa | University of Malta
Dylan Seychell | University of Malta
Mark Bugeja | University of Malta

Town maps are an essential element for navigation and immersion in roleplaying games. Content creators for tabletop and digital RPGs seek tools for facilitating the time-consuming process of manually creating new maps, or to quickly generate concepts to adapt successively. Several tools exist for this purpose, supporting manual or procedural design, or a combination of the two. However, these techniques generally depend on assets packaged with the product, where the believability or appeal of the output is limited by the amount of assets available (which may cause the same one to be used repeatedly) and their resolution (which may cause tiling artefacts). Other tools remove the reliance on assets by representing generated maps as plain colours, but this option is generally not considered suitable as a final product.

In order to address the above limitations, and in light of the recent success of conditional generative adversarial networks (cGANs) in other domains, a generative technique is proposed for texturing maps using feature labels as the conditioning input for determining the type of map element to be drawn by the network. While the technique does not produce visuals that are as sharp as asset-based rendering, it displays a greater variety in the output without the need for hand-crafting any assets. This work also proposes an algorithmic method for tiling the network output with the aim of increasing final resolution and suggestions for obtaining satisfactory results with small datasets in this scenario. The results obtained are demonstrated by an online tool.

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*21: The Impact of AI on the Replayability of Interactive Digital Narratives.

Ruth Bugeja | Saint Martin's Institute of Higher Education
Jonathan Barbara | Saint Martin's Institute of Higher Education

Interactive Narratives are a rising genre in digital games that intends to immerse players into the gameworld by allowing them to affect its narrative. Being relatively new to the gaming industry, Interactive Narratives are not without limitations and have yet to reach their full potential. Most common implementations are found in the form of branching narratives, which can be fun at first but usually suffer in replayability. There is a lack of games which allow players proper story agency, which is above the provision of narrative agency within the confines afforded by the developers' design. Such story agency demands the player to not just react to the narrative, but take active control of the narrative direction. This study sets out to investigate story agency using AI within Interactive Narratives and its impact on enjoyment and replayability. The literature suggests the use of Procedural Storytelling as a method of implementation, and player experience as a measure of impact. The experiment used an AI-driven Interactive Narrative engine to provide a dream-like story responding to the user's textual input. This was followed by a questionnaire to gather player feedback on perceived agency, enjoyment, and replayability. Preliminary results (N=23) suggest that players find such interactive narratives to be replayable and enjoyable. However, as not all players felt power over the story, there was not enough dependence of replayability on perceived story agency. Further studies in comparing replayability of AI-driven interactive narratives with branching narratives may encourage use of AI in player-driven story generation.

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*22: Evaluating AI Agents to solve the Blackjack problem.

Gabriel Camilleri | University of Malta
Jake Seracino | University of Malta
David Vella | | University of Malta
Jacob Cassar Ellis | | University of Malta
Mark Bugeja | University of Malta

Blackjack is one of the most popular casino games in the world. It involves comparing cards between the players and the dealer. In this research, we implemented a number of AI agents adapted from several machine learning techniques that could solve the Blackjack problem. Each algorithm is designed to approximate the most optimal strategy which dictates what action should be taken given a particular game state so as to maximise winning likelihood. The three algorithms implemented are Q-Learning, an evolutionary algorithm and an evolutionary neural network. Whereas typical studies conducted in the domain focus mainly on three legal actions; hitting, standing and doubling-down, our contribution also considers splitting as this action is allowed in most casino variations of Blackjack. The algorithms mentioned were initially evaluated separately. The Q-Learning algorithm was evaluated on three ordering criterion; the combination which won the most rounds, the combination which lost least, and the combination which had the best amount of net chips. The Genetic algorithm performed five consecutive tests of 100000 rounds, recording the criterion previously mentioned. The Evolutionary Neural Network was tested with different hyperparameters with 5000 epochs each. The aforementioned algorithms are also compared against each other to see which one performs best. Finally, the knowledge learnt by the AI agents was transferred into a Unity-based Blackjack simulation to allow the user to see in real-time the decisions taken by the agent given a particular game state. It is concluded that the GA implemented, approximated a better strategy for blackjack then Q-Learning and ENN.

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*23: In a discussion moderated by Alexander Pfeiffer, Mark Bugeja and Alesja Serada further thoughts should be identified on how we can log the activities of digital agents so that agents can interact between different parties in a trusted and secure way.

The conference will then be evaluated informally and ideas for 2021 will be collected. Small break-out rooms for private networking are also available.