ICIDS

2022

Accepted Papers with Abstracts

Paper Presentations 1: IDN and Complexity

The future of the world: from scientific account to interactive storytelling

Sophie Varone and Nicolas Szilas

Abstract: Starting from the observation that a cognitive distance prevents human beings from taking the measure of the current climate crisis and adopting adequate behaviors, this article asks the question to what extent a narrative approach could help to reduce it. First, it proposes a narratological analysis of some of the scenarios of the future of the world outlined by the scientific community, the Shared Socio-economic Pathways, which leads to the conclusion that, despite the terminology used in the associated commentaries, these scenarios have little narrative value. Continuing with a questioning of the difficulties and implications of the conception of a narrative about the future, it then shows how the approach of anticipation narratives, which consist in envisioning tomorrow on the basis of choices made today, naturally approaches that of interactive narrative. Finally, it argues that transforming the scientific scenario into a fully-fledged narrative cannot be done without adding fictional elements which, if they are coherent and plausible, can only enrich it and sharpen its didactic impact.

When Information, Narrative, and Interactivity Join Forces: Designing and Co-Designing Interactive Digital Narratives for Complex Issues

Pratama W. Atmaja and Sugiarto.

Abstract: The world is inherently and tremendously complex, yet many people are not well-equipped to deal with complex issues such as sustainability. Consequently, the issues must be communicated appropriately to the public. Narratives are effective for complex issue communication (CIC), especially when delivered through interactive digital narratives (IDNs). However, no design methodology is currently available for IDNs for CIC, especially one that balances the IDNs' information, narrative, and interactivity aspects. Thus, through a literature review, we propose two design methodologies: the first facilitates a comprehensive requirement gathering and design process, and the second restructures the first to facilitate co-design between interdisciplinary experts, each handling one of the aspects. The co-design methodology's complex systems foundation unites the experts and eases their communication. We close this paper with a discussion of new design concepts in the methodologies, including

analyzing the audience's comprehension process as a hierarchy of hermeneutic cycles and using a syuzhet to restructure the narrative according to the hierarchy.

Interactive Cartographic Storytelling with Complex Spatio-Temporal Structures and Social Connections

Ying Zhu, Aylish Turner, Naomi Yonas, and Douglas Blackmon

Abstract: In this paper, we describe the design of an interactive cartographic storytelling platform for the 1906 Atlanta Race Massacre, a horrific incident that had a profound impact on the civil and human rights movement in the United States. This four-day event happened at various locations in downtown Atlanta and involved many people. Although multiple books and articles have been written about the 1906 Atlanta Race Massacre, they described the past events using conventional storytelling methods. We want to tell this story from a cartographic perspective because the locations are essential to this story. We also want to connect the past with the present because most people walking on the same streets today do not know the history and significance of the locations. Furthermore, most people are unaware that some major institutions are intricately connected to the people involved in the 1906 events. Telling the story this way requires us to handle a complex spatio-temporal structure and an extensive social network, which is unusual in traditional cartographic storytelling. In this paper, we discuss our design decisions and rationals. We believe our discussion will benefit other interactive story designers who deal with similar complex stories.

Planner Systems for Historical Justice? A Case Study of a People's History of Lebanon

Fabiola Hanna

Abstract: This paper examines We Are History: A People's History of Lebanon as a case study for pursuing historical justice in post-war contexts. The planner not only satisfies three existing desires—co-creation, polyvocality, and pushing against a singular truth—but also poses the question of the beneficiary of these narratives and digital projects.

Paper Presentations 2: Cultural Heritage

Interactive digital storytelling in cultural heritage: the transformative role of agency

Dimitra Petousi, Akrivi Katifori, Katerina Servi, Maria Roussou and Yannis Ioannidis

Abstract: Digital storytelling has been established as an effective approach for promoting visitor engagement in cultural heritage contexts. Interactive digital storytelling is however not as prevalent in this field. In this work we attempt to gain insight for the added value that interaction in the form of enhanced user agency brings to a cultural heritage experience in terms of supporting its ultimate objectives: engagement with the cultural content as well as reflection, meaning making and historical empathy. Through a user study with 67 participants experiencing a historical “choose your own adventure” type of IDN on-line, we examine the user experience in general and, in particular, correlations of user perceived agency with the dimensions of immersion and transformation. Our results are promising as to the use of this type of IDN for the wider audiences and reveal a concrete effect of user perceived agency on the aforementioned two user experience dimensions.

Communication features facilitating appreciation of Cultural Heritage Values for IDN

Srushti Goud and Vincenzo Lombardo

Abstract: Cultural heritage values are defined as a set of characteristics perceived in heritage by certain individuals or groups. Cultural heritage values highlight the motivations for the conservation of heritage properties by national and international organizations. These include value associations selected by experts and communities. Heritage values of communities are passed down over generations and help in conservation. Historic and traditional (pre-digital) narratives communicated values but not all sources were credible. Current efforts using digital technologies for the communication of cultural heritage disproportionately focuses on engagement and spectacularization. This has had a negative effect on research towards the sharing of cultural heritage values through Interactive Digital Narratives (IDN). We believe that a number of communication features can be beneficial to value appreciation especially when using IDN. In this paper, we discuss values included by the designer(s) and also appreciated by the user(s) of IDN in the communication of cultural heritage. We address four types of features

that are suggested as being influential for the communication of cultural heritage values, namely 1) narrative significance, 2) multiperspectivity, 3) dialogue facilitation, 4) contextualization. We go through six case studies and show how to exploit these IDN features to effectively communicate the associated values of cultural heritage to a larger audience.

Embodied Locative Storytelling of African American Histories

Candice Butts and Michael Nitsche

Abstract: This project examines the value of custom-built wearable interfaces for historic reenactment. It uses new media to explore mourning culture, African American identity, and female-led gender roles within the context of Oak-land Cemetery, a Victorian cemetery in Atlanta, GA. Tangible interfaces and site-specific storytelling combine to support a historic tour on site. Multiple tangible interfaces were integrated into a historic dress and various props to offer novel expressive means to tour guides and engaging activities for visitors. This combination of narrative and performative interaction design aimed to provide cultural framing and emphasize African American histories embedded in the cemetery. The project was evaluated with tour guides (n=7) and site visitors (n=11). Key findings confirm narrative effectiveness through empathy, values for playful engagement, emphasis on user interaction in the narration, and close integration of digital technology to the site.

Applying Black Feminist Technopractice in Digital Storytelling at Cultural Sites

Brandy Pettijohn

Abstract: We have been habituated to a type of story about Black American experience, and this habituation - the idea that we know a story before we encounter it - can influence how we embark on creating digital narratives for Black cultural and historic sites. The promise of digital media is that we might be able to tell fuller and richer stories; however, technical affordances can place the story in service of technology instead of the story being guided along by technology. Therefore, the ethical dilemma is how can a project, where agency and meaning-making are central concepts for success, be created for a topic that designers actually know little about? Cultural sensitivities need to be considered for digitally mediated cultural and historic environments and unintentional harm to both the story and the people who will come in contact with it can occur if adjustments are not made throughout the design process. These sensitivities will inevitably affect the scope of agency and meaning-making because the

variables within the story are more fixed. While technological affordances can help remediate story habituation, in order to avoid some of the pitfalls of harmful storytelling, makers should consider theoretical frameworks to guide their practice. This essay proposes Black Feminist Techhnopractice as a theoretical framework to guide methods in creating interactive narratives for Black cultural sites. Black feminist technopractice is a theoretical framework that guides practices and essentially combines Black feminist design (researchers) and Black technoculture (participants) into a technopractice

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Towards a Decolonial Framework for IDN

Claudia Silva, Reyes Maria Cecilia, and Hartmut Koenitz

Abstract: This paper discusses the application of decolonial thinking to Interactive Digital Narrative (IDN) with the goal of creating a decolonial framework. We provide motivation for this endeavor, and report on a workshop we conducted called “Time for Repositioning”, aiming to decolonize a European network concerned with IDN. Then, we analyze several concrete example IDN works which embody decolonial thinking. Finally, we offer some concrete steps for scholars to decolonialize their work which also provide the foundation of our ongoing work towards a more developed decolonial framework.

Paper Presentations 3: Explorations

Supporting Spatial Thinking in Augmented Reality Narrative: a Field Study

Abbey Singh, Matthew Peachey, Ramanpreet Kaur, Peter Haltner, Shannon Frederick, Mohammed Alnusayri, David Choco Manco, Colton Morris, Shannon Brownlee, Joseph Malloch, and Derek Reilly

Abstract: Immersive augmented reality (AR) is an exciting medium for locative narrative. Immersive AR experiences are largely custom-made and site-specific, however: we lack generic tools that help authors consider interactions between physical layout, viewer perspective, and story progression, for specific sites or for locations unknown to the author. In this paper we evaluate Story CreatAR, a tool that incorporates spatial analysis techniques used in architecture, planning, and social sciences to help authors construct and deploy immersive AR narratives. We worked with three authors over several months, moving from script writing and story graph creation to deployment using the tool. We conduct a thematic analysis of each author's actions, comments, generated artifacts, and interview responses. Authors faced a steep learning curve, sometimes misinterpreting spatial properties, and found it difficult to consider multi-site deployment. Despite these challenges, Story CreatAR helped authors consider the impact of layout on their stories in ways their scripts and graphs did not, and authors identified several additional areas for spatial analysis support, suggesting that tools like Story CreatAR are a promising direction for producing immersive AR narratives. Reflecting on author experiences, we identify a number of features that such tools should provide.

When You Hear the Chime: Movable Books and the Dramaturgical Functions of Sound in Mixed Reality Interactive Narrative Design

Lissa Holloway-Attaway and Rebecca Rouse

Abstract: In this paper we outline the pre-digital histories of recorded and synthesized sound, exploring their entanglements with both the literal codex and larger literary imaginary. In particular, we focus on intersections of sound and movable books, offering the rich genealogy of the movable book as a fertile addition to the IDN (interactive digital narrative) family tree, as an example of pre-computational interactive narrative with a long history. Drawing on this intermedial history, along with our own experience designing an MR (mixed reality) movable

book, we offer a taxonomy of dramaturgical functions of sound in MR IDN. We demonstrate the use of this taxonomy in analysis of our own work, and suggest opportunities for expanding the taxonomy in support of future speculative research and design imaginaries for IDNs.

Integrating Brechtian Concepts in the Design of a Tangible Narrative: The Case of "The Non-myth of the Noble Red"

Daniel Echeverri

Abstract: Extending previous research on tangible narratives, this paper introduces a new design case - The Non-myth of the Noble Red. The preliminary work for building the case draws from and tests against a typology that characterises the tangible artefacts with narrative meaning and a narrative architecture for tangible narratives. The paper exemplifies how The Non-myth of the Noble Red integrates concepts from Brechtian theatre and presents its technical considerations. It concludes on the importance of emphasising the critical discourse of the narrative and that examining alternative storytelling methods allows the author to approach concepts that are rarely considered in conventional interactive media.

Constructing a Catbox: Story Volume Poetics in Umineko no Naku Koro ni

Isaac Karth, Nic Junius, and Max Kreminski

Abstract: Many interactive digital narrative (IDN) systems are capable of producing numerous distinct storylines, which share some common properties but differ from one another in ways that appear contradictory when attempting to treat them as co-canonical. One theory of IDN poetics therefore positions an IDN system as defining a story volume: a generating function that produces storylines, and whose meaning lies not just in the storylines themselves but also in the relationships between these storylines. However, the discussion of story volumes has until now been entangled with the discussion of choice and emergence, making the scope of this theory's applicability unclear. To advance understanding of the poetics of story volumes, we examine Umineko no Naku Koro ni---a heavily metafictional visual novel series with no emergent narrative component and almost no player choice, but in which the characters explicitly understand themselves as existing within a story volume---as a case study of how story volumes can be used to create narrative meaning.

Build your World – meaningful choices in a hybrid stage play

Nils Gallist, *Manuel Lattner*, *Michael Lankes*, *and* *Juergen Hagler*

Abstract: This paper examines the design of meaningful choices for theater audiences embedded in a hybrid play using digital tools and systems. A case study is presented that is established on a hybrid stage performance called ALIENATION based on the so-far unpublished eponymous novel by Corinna Antelmann, which premiered in early 2022, at the ANONYMIZED FOR REVIEW. The audience could take part in the performance via a real-time rendering engine. Apart from describing the case study in detail, we outline further applications and opportunities to facilitate audience participation and engagement. In general, ALIENATION's design and production positively impacted the audience's attention, especially regarding younger demographics.

Paper Presentations 4: Teaching and Representing

Teaching Literary Interactive Digital Narratives in Secondary Education: a French study

Serge Bouchardon and Magali Brunel

Abstract: As part of a collaborative research project carried out in the Nice Academy (France) with a group of seven teachers in literature classes, the article aims to describe the various aspects and specificities of the teaching of literary interactive digital narratives in junior and senior high school classes. We focus on the treatment given by teachers to the different aspects of these digital works, the choices that the teachers make regarding didactic transposition, and the choices that the teachers offer pupils regarding writing practices.

Using Storytelling to Teach Children Biodiversity

Maria José Ferreira, Raul Benites Paradeda, Raquel Oliveira, Valentina Nisi, and Ana Paiva

Abstract: This paper is about improving children's learning of biodiversity and preservation of the environment through interactive storytelling and gaming.
We conducted a user study with a between-subjects design with eighty-three children aged 6 to 10 years from the South of Brazil. We analysed the role of the agent's embodiment (embodied vs not embodied), the presence (or absence) of storytelling, and children's previous knowledge of biodiversity, in children's performance and engagement with the application. Our results demonstrate that: a) children seeing familiar biodiversity were more engaged with our system than those seeing non-familiar biodiversity, and b) children with a higher level of knowledge (3rd and 4th school years) performed better in the species identification task than those with a lower level of knowledge (1st and 2nd school years).

Approaches towards novel phenomena. A reflection on issues in IDN research, teaching and practice

Hartmut Koenitz and Mirjam Eladhari

Abstract: What happens when scholars approach novel phenomena such as Interactive Digital Narrative (IDN)? How can we be certain that theoretical frameworks, analytical approaches, and vocabulary are adequate, meaning that they are able to fully describe the specific characteristics of the novel phenomena? The same goes for approaches in the practice - how can we be sure that the chosen design methods enable the use of the full expressive potential of a novel phenomena? Furthermore, we ask how we can critique and improve categories and approaches? We reflect on how theory and analytical approaches have been produced so far, identify issues with the current practice, consider alternatives and propose a number of measures to improve the situation, amongst them increased efforts on the meta-level in terms of theoretical development and reflective works which concern themselves with the further development of the field, iterative approaches towards theory and method, a more critical approach in education, multi-method analysis, and dynamic representations.

Button Portraits: Embodying Queer History with Interactive Wearable Artifacts

Alexandra Teixeira Riggs, Noura Howell, and Anne Sullivan

Abstract: Button Portraits is a tangible narrative (TN) that represents queer history using artifacts from a gender and sexuality archive at a US Southern university. The experience tells the stories of queer activists who influenced and produced the city's patchwork of LGBTQ+ organizations from the mid 1970s to the present. As a case study, this project offers insights on how wearability, embodiment, and queer archival methods can shape the design and experience of tangible historical narratives and their ability to call for reflection on our relationships to archival materials and history. This paper argues that queer methods can develop and reveal embodied, liminal stories in TNs in the following ways: 1. Using queer methods and queer archival scholarship to understand and design tangible narratives engenders experiences that resist binary narrative categories. 2. Designing queer history tangible narratives requires understanding the sociocultural context and the ways the experience itself can be queered. 3. Embodiment through wearability in a queer TN experience troubles the relation of bodies, spaces, selves, and stories—reinforcing our queer theoretical framing. Overall, this design case study illustrates how tangible storytelling design can be deepened through attention to queer methods, especially when used alongside embodiment and wearability.

Paper Presentations 5: Interactive Narrative Design

Select the Unexpected: A Statistical Heuristic for Story Sifting

Max Kreminski, Melanie Dickinson, Noah Wardrip-Fruin, and Michael Mateas

Abstract: Story sifting techniques, which aim to excavate potentially compelling microstories from vast chronicles of storyworld events, present a promising solution to the challenges of interactive emergent narrative. However, current sifting techniques (which rely on large numbers of hand-specified story sifting patterns to identify compelling microstories) are limited by their inability to determine which of many sifting pattern matches are likely to be the most interesting to a human interactor. We present a higher-level story sifting heuristic that addresses this problem by identifying sifting pattern matches that are especially unlikely from a statistical perspective, and illustrate how this heuristic leads to the surfacing of more interesting microstories.

Computational Support for Trope Analysis of Textual Narratives

Mandar Chaudhary and Arnav Jhala

Abstract: Narrative tropes are repeated patterns of recognizable communicative elements across stories. Tropes are a set of patterns that aid readers in story comprehension. They are also a reflection of socio-cultural norms that are formally or informally present in the particular context for authors and readers. Trope-based analyses are common in media studies but are limited to close readings and individual analyst perspectives. Distant reading of tropes is challenging due to the lack of precise definitions and the variety of forms in which tropes manifest in language, and over space and time within story worlds. This paper presents an initial analysis framework and a system for computational support of trope analysis. For highlighting the challenges of developing computational models, we present a trope prediction algorithm on a movie script dataset based on a model trained with human-annotated tropes from TVTropes. We also present a novel interactive experience that allows users to explore trope detection.

Writing with (Digital) Scissors: Designing a Text Editing Tool for Assisted Storytelling using Crowd-Generated Content

Paulo Bala, Stuart James, Alessio Del Bue, and Valentina Nisi

Abstract: Digital Storytelling can exploit numerous technologies and sources of information to support the creation, refinement and enhancement of a narrative. Research on text editing tools has created novel interactions that support authors in different stages of the creative process, such as the inclusion of crowd-generated content for writing. While these interactions have the potential to change workflows, integration of these in a way that is useful and matches users' needs is unclear. In order to investigate the space of Assisted Storytelling, we designed and conducted a study to investigate how users write and edit a story about Cultural Heritage using an auxiliary source like Wikipedia. Through a diffractive analysis of stories, creative processes, and social and cultural contexts, we reflect and derive implications for design. These were applied to develop an AI-supported text editing tool using crowd-sourced content from Wikipedia and Wikidata.

Bronco: A Universal Authoring Language for Controllable Text Generation

Jonas P. Knochelmann and Rogelio E. Cardona-Rivera

Abstract: We present Bronco: an in-development authoring language for Turing-complete procedural text generation. Our language emerged from a close examination of existing tools. This analysis led to our desire of supporting users in specifying yielding grammars, a formalism we in- vented that is more expressive than what several popular and available solutions offer. With this formalism as our basis, we detail the qualities of Bronco that expose its power in author-focused ways.

Dramatic Situations for Emergent Narrative System Authorship

Jonathan Lessard and Samuel Paré-Chouinard

Abstract: When designing and developing an emergent narrative system, one finds themselves in the difficult situation of working with low-level mechanisms while aspiring for high-level, longer-term emergent outcomes. To complicate things further, the desired output is not a concrete artifact but an ambiguous mental construct: something potentially recognized as a story. We think that dramatic situations, as conceptualized by Georges Polti, can act as a useful in-between heuristic: they are sufficiently formalized to inform the design of low-level operations, but abstract enough so as not to overdetermine the output.

In this paper, we re-theorize Polti's dramatic situations in the context of emergent narrative systems design. We posit that their generative potential arises from the fact that they are both sequence-independent and sequence-productive; as well as character-independent and character-productive. We then consider the qualitative aspects of their generativity against the narratological notions of "tellability" and "eventfulness".

To substantiate this theoretical proposition, we use dramatic situations as emergent narrative design heuristics in the development of the Chroniqueur project. We then analyze three emergent story retellings against our proposed generative and qualitative criteria. We find that identifying a dramatic situation prompts the construction of a story as it incites tracing its causes and discovering its outcome. Observing the behavior of the involved parties significantly contributes to their characterization. As dramatic situations are relatively rare in a character's life and typically have high stakes, they are likely to be noteworthy.

Paper Presentations 6: Authoring Tools

Locative Authoring: Evaluating the StoryPlaces Authoring Tool

Sofia Kitromili, David Millard, Charlie Hargood, Huiwen Zhao, and Jim Pope

Abstract: Locative Narrative is a form of Interactive Digital Narrative (IDN) where the readers' location and movement is the main form of interaction. The StoryPlaces platform provides a general toolset for the creation and delivery of these location aware stories. However, while there is existing research on the reader experience with this technology, comparatively little is known about the author experience. We recruited five interactive narrative design students to participate in a usability test of the StoryPlaces pattern-based authoring tool, using observations, interviews, and analysis of their stories to understand their experience. We show that while participants superficially liked the interface of the StoryPlaces authoring tool, they had difficulty understanding the aspects that were less clearly visualised and struggled to test their creations. The patterns enabled them to add complex functionality easily, but became a barrier if they wanted to deviate from them. Our findings mostly support Green's five principles of IDN authoring (on the value of visual metaphors and fast track testing), but suggests they need refinement as in application it was important to distinguish between the visualisation of different aspects of the story (location vs. logical structures), and that failure to properly visualise sometimes led to avoidance or displacement of activity rather than a drop in its quality.

The investigation of socio-cultural features within interactive discourse generation and their applicability for authoring

Djordan Papilaya and Frank Nack

Abstract: The authoring of digital interactive narratives is a complicated craft that addresses complexity on the level of content selection, mode of interaction, audience perception, and narrative generation. Though there have been significant developments in authoring tools for interactive narratives as well as a growing number of models explaining narrative meaning production, there is still a lack of understanding around what type of system support it requires so that the curation of models and strategies at the end can facilitate an adequate provision of content to the interacting user. In this paper, we present an investigation that aims to establish relations between individual information needs and navigation behaviour, which can be used as patterns to support authors in the design and development of IDN interaction. A prototype of an argumentative discourse environment has been developed, in which participants can explore information resources in various media representations and complexity levels to explore the

topic of climate change. The navigation behaviour has been tracked, and qualitative interviews have been performed to gain deeper insights in the relation between personal information needs, resource preferences and investigation behaviour. The findings of the analysis show that socio-cultural attributes can be identified that correlate to certain navigation patterns. We also show how those patterns can be made available in an IDN authoring environment to the author to facilitate a faster design of an interaction engine and related inference mechanisms.

Resources for Comparative Analysis of IDN Authoring Tools

Yotam Shibolet and Vincenzo Lombardo

Abstract: Authoring tools are a crucial component in the practice and research of interactive digital narrative design, yet there is no contemporary knowledge base to evaluate and comparatively analyze the great many tools that currently exist. This paper takes on the tasks of creating a framework for the description and comparison of IDN authoring tools and their defining characteristics and affordances, and of developing this framework into a community resource. We propose a descriptive framework and an online resource meant to facilitate the development of a tool database and curate its properties.

Our framework is composed of 30 tool descriptors, addressing (among other factors) the tools' basic identify, business model, use context, technical information, interface affordances and unique design elements. Values were additionally created to define the answer range for most descriptors and streamline the process of tool-logging via the online form we created.
In this paper, we explain and demonstrate our framework and present the online database and examples of the sort of meta-analysis it can generate, testifying to the potential usefulness of our framework to the research and practice community.

Adventures in TwineSpace: An Augmented Reality Story Format for Twine

Ps Berge, Daniel Cox, Jack Murray, and Anastasia Salter

Abstract: Augmented reality games have moved into the mainstream thanks to headline-catching titles such as Pokémon GO (2016) and Harry Potter Wizards Unite (2019). However, these games represent only a small portion of what is possible in this space, as demonstrated by emerging independent and serious game efforts in this area. Such development is hindered by the challenges facing individual and casual designers in finding AR

tools and accessible engines. By exploring the legacy of casual, “low-friction” AR development and text-game design, we argue previous attempts to integrate narrative engines with augmented reality (e.g. Ar-gon.js + Twine, ARIS) and image recognition (Vuforia, AR.js) have yet to mean-ingfully center casual development. With this in mind, we present a working pro-totype called TwineSpace combining popular hypertext authoring tool Twine 2 with open-source augmented reality tools A-Frame and AR.js that opens the pos-sibilities for play within the world of spatial narrative. By combining open-source solutions, we hope this new authoring experience can help improve spatial story-telling for indie game designers, teachers, storytellers, and casual creators alike.

Paper Presentations 7: VR AR Metaverse

Identification and IDNs in the Metaverse: who will we be?

Jonathan Barbara and Mads Haahr

Abstract: One's digital identity on the Metaverse is critical enough to warrant EU regulation. Suggesting Interactive Digital Narratives as having a role to play in the Metaverse, we focus on the identity of the Virtual Reality interactor in such virtual spaces, and the potential impact this may have on the self-identity of the interactor. Building upon the notions of identity and the interactor's construction of their narrative identity, we revisit identification in the context of VR Interactive Narratives (VRINs) and explore authenticity and character similarity as its dimensions. We interpret the construction of a narrative identity in VR as a vehicle for identity shift between the interactor's self-identity and identification with the character. Based on the theoretical framework, we present a conceptual model for identity shift in VRINs which we then apply to a number of case studies to exemplify its utility and provide some guidelines for VRIN authors in how to use this model.

A New Research Agenda: Writing for Virtual Reality Interactive Narratives

Joshua Fisher, Mirjam Vosmeer, and Jonathan Barbara

Abstract: Scriptwriting for Virtual Reality Interactive Digital Narratives (IDN) de-rives insights from writing for linear or cinematic Virtual Reality (VR). However, due to the lack of agency in linear VR, the insights from the scholarship are limited. Therefore, this paper suggests a new research agenda to explore scriptwriting for VR IDN. The paper establishes a number of in-sights and challenges that writers for VR IDN may encounter, such as scripting the body, movement, environmental storytelling and guiding the interactors' gaze. Consequently, the research agenda is proposed, exploring the different levels in the systems-process-product (SPP) model to categorize the previously described insights and challenges, ultimately also investigating the use of the SPP model as a compositional tool.

Exploring Classical Music Narratives through Multimodality in AR/VR Experiences

Svetlana Rudenko, Maura McDonnell, Timothy Layden, and Mads Haahr

Abstract: Although Music is considered the field of emotions and moods, every composition has a structure: beginning, development, climax and conclusion. In classical music, there are many genres, but each piece always tells a story. Even more, most classical compositions follow the familiar structure of Aristotelian drama. Classical music narrative can take a number of forms: as music analysis on structures of the form (e.g., Sonata form with contrasting themes), emotional narrative (usually miniatures dedicated to one mood range, e.g., the genre of Prelude) or a program narrative according to composer's notes (e.g., Berlioz's Symphonie Fantastique). Generally speaking, perception of music is multisensory, so when music tells a story, it does so in a multimodal fashion. In this position paper, we present our investigation into visualisation of music narrative based on different forms of music narratives, and then show how visuals developed by cross-modal associations and synaesthesia art can be used to construct music narrative that is interactive. Our ultimate aim is to develop the approach into AR/VR visualisations of classical music with a strong narrative content.

The Impacts of Unguided Immersive and Interactive Storytelling in VR on Emotion, Mood, and Self-Reflection

Austin Wolfe, Sandy Louchart and Brian Loranger

Abstract: Storytelling entertains, educates, and inspires people of all ages and a compelling story has the power to motivate, elicit emotions, behavioural change, and inspire self-reflection. Interactive Digital Narratives (IDN) offer, arguably, a greater potential for impact on their audience due to the participative nature of interaction whilst storytelling in Virtual Reality (VR), benefits from high levels of immersion. This work focuses on the design and development of compelling narrative elements towards a non-narrated and unguided VR experience aimed at portraying and evoking emotions, moods, and self-reflection. We explore how the combined elements of light, colour, shape and music can play a role in creating compelling stories and supporting affect within an immersive VR experience. Finally, this article presents an extensive study of relevant literature, the design of an impactful immersive VR narrative experience and an exploratory practice-based study.

Paper Presentations 8: Games and Storytelling

Myth, Diegesis and Storytelling in Perennial Games

Bjarke Alexander Larsen and Elin Carstensdottir

Abstract: Perennial games---ongoing, live games---are a form of games that often seem at odds with storytelling through their temporality, repetition and strange diegesis. This paper proposes a reframing of storytelling in perennial games as \textit{myth} to alleviate these problems.
Two layers of myth are presented, the first as the constructed fictional layer, and the second as the lived experience of the communities and people engaging with the game. This avoids the traditional player/author split, often seen as problematic in perennial games, by not focusing on authorship or control of these layers. Rather, it focuses on what each layer is affecting about the experience, how both authors and audience can engage with each layer, and how these layers affect each other. Three additional problems with perennial storytelling are identified that this reframing as myth helps alleviate.
Framing the play of perennial games as myth shows how players are a part of a greater mythological experience in a disenchanted world. It explains the repetitive nature of perennial games as re-enactment and ritual, instead of as a logic-breaking repetition of story events. Furthermore, mythology has an inherently complicated relationship with truth and fiction, and this fits naturally with a similar relationship of perennial games and diegesis. Through this recontextualisation, we can improve understanding of how players are experiencing and engaging with perennial stories with a holistical understanding of their play and development.

Turn story to life in 1001 Nights: A Co-Creative Text Adventure Game Using A Story Generation Model

Yuqian Sun, Xuran Ni, Haozhen Feng, Ray Lc, Chang Hee Lee, and Ali Asadipour

Abstract: How can stories we tell be turned from abstractions in our own minds to concrete elements in a digital environment we interact with? To immerse everyday storytelling into real-life contexts in digital interactions, we created a game that turns entities in a story into digital assets that have functional roles. Taking the classic folklore as inspiration, we created 1001 Nights, a co-creative, mix-initiative storytelling game using an existing AI creative writing system. In this game, Shahrzad (driven by the player) needs to tell stories through a dialogue interface, while the King (driven by the AI model) will continue the player's story in turn. Text from the story is utilised in actual game mechanisms, so that weapon keywords in the game like

"sword" or "shield" will turn into equipment that can be used for battle. This also leads to an alternative ending from the original story: Heroine Shahrzad defeats the tyrant. The game aims to facilitate player engagement and creativity through natural language interactions through an empowering story of a female protagonist who tells stories in a cultural context to accomplish her goals. We connected the story background, game mechanics, and AI systems for player engagement, and analysed instrumented gameplay data from 2056 players and comments from 422 players. The result demonstrates that players' engagement, in form of the number of inputs, significantly corresponds with their overall achievements in this game.

Visionary Virtual Worlds: Storytelling via Digital Architecture in NaissanceE

Gabriele Aroni

Abstract: The narrative and worldbuilding of digital games are often constructed through their architectural design. This paper analyzes how virtual architecture can enable interactive digital storytelling through the case study of the game NaissanceE (Limasse Five 2014), which displays particularly imaginative architectural spaces within the panorama of digital games. NaissanceE's architecture will be looked at through the lenses of 18th century visionary architecture, such as the works of Italian engraver Giovanni Battista Piranesi and French architect Étienne-Louis Boullée, as well contemporary mangaka Tsutomu Nihei, in order to understand which architectural elements carry the narration, how they are employed, and how they are understood by players.

Exploring the Design Space of Social Physics Engines in Games

Shi Johnson-Bey, Mark J. Nelson, and Michael Mateas

Abstract: Social simulation in video games approximates believable social behavior between characters. Game franchises like Crusader Kings, The Sims, and Dwarf Fortress became famous for using social simulation for emergent storytelling. Despite the success of using social simulation as a core aspect of gameplay, there is a seeming lack of publicly available tools for helping game developers create these types of experiences. To help encourage the development of open-source social simulation tools, we further explore the concept of social physics engines — self-contained solutions for modeling dynamic social relationships between non-player characters and players. We propose a design space for constructing social physics

systems. It is inspired by rigid-body physics engines and is informed by a design space analysis using commercial and academic social simulation games and systems.

What Inspires Retellings - A Study of the Game Genshin Impact

Miranda Greting, Xiehui Mao, and Mirjam Eladhari

Abstract: This paper presents a study of retellings about the game Genshin Impact, exploring how the game's narrative design inspires players to create fiction and art based on the game's universe. A questionnaire sent to players rendered 1606 replies, and based on the findings in this corpus, eight players, avid creators of retellings, were interviewed in-depth. Among our findings were that players were inspired mostly by the characters in the game, and the regional cultures in the game world. Their motivation to create was often spurred by the gaps and ambiguities in the detailed narrative design, wanting to 'fill in the gaps' and, through their own creation of fiction, further explore the intricacies of the game's narrative elements.

Carambola: Enforcing Relationships Between Values in Value-Sensitive Agent Design

Luis Garcia and Chris Martens

Abstract: Carambola is a text-based strategy game that operationalizes the Theory of Basic Values (TBV) to model the motivations of its non-player characters (NPC) and the dilemmas it presents to players. The player takes on the role of the Emperor of a nation, making a series of executive decisions while noting the subsequent reactions of their NPC advisors. After a fixed number of rounds in which they choose actions, their NPC advisors vote on whether they should dethrone the player based on the affinity they have with the other subjects of the game. Advisor affinity is affected by the Emperor's actions, which each harm and promote a subset of their values. Our implementation of the TBV is a geometric interpretation that enforces restrictions on the attitudes that agents can have toward the values. We give a brief overview of the theory, and then describe our implementation and our plans for evaluating how this usage of the TBV affects the advisors' believability.

Paper Presentations 9: Audience and Collaboration

Narrative Mode of the Third Kind

Nicolas Szilas

Abstract: The boundary between non-interactive and interactive narrative is a central focus in the debates regarding interactive media and narrative. Another boundary is highlighted in this article when interactivity is such that the audience lives the story offered to them. To represent this boundary, we in-troduced a new narrative mode, in addition to the classic diegetic and mi-metic modes, which we term the demiurgic mode of narrative. The specifici-ties of this mode are then discussed regarding cognitive representations.

Interactive Storytelling and the Paradox of Democracy

Warren Sack

Abstract: Interactive stories have a politics that leans democratic. This politics hinges on the ability of the audience to interrupt and pose a question or ask for an alternative narrative. The history of democratic interactive storytelling in multiple media is briefly outlined. The “paradox of democracy,” analogous to the “narrative paradox,” is introduced and a challenge for the design of interactive democratic narrative systems – agency with accountability -- is presented by shortly examining two implemented systems.

IF Reader: A Screen Reader Browser Extension for Twine Games

Luowen Qiao and Anne Sullivan.

Abstract: In this paper, we describe the design, evaluation, and results of a screen reader created to improve the interactive fiction (IF) game experience for people with visual impairments. Our screen reader focuses primarily on IF experiences written with Twine 2 using the Harlowe and Sugarcube story formats. As a starting framework, we use the accessibility guidelines for interactive fiction to address two major shortcomings with general screen readers as they relate to Twine: correcting page content extraction with Twine-specific HTML elements and creating sound notifications and read out for page updates which are used quite regularly in Twine experiences. Running small-scale user evaluations of our screen reader with both novice

and expert screen reader users allowed us to refine our screen reader and highlight some ongoing challenges in this area. Finally, we posit that to improve the overall accessibility of interaction fiction requires the contribution of the entire IF community.

Intersubjective Pivots in Interactive Digital Narrative Design Learning

Colette Daiute, John T. Murray, Jack Wright, and Terrence Calistro

Abstract: Interactions between players and designers during IDN authoring are an undervalued source of information about the authoring process. This paper analyzes a corpus of player-author interactions from an online workshop. We classified feedback types and IDN design features, showing player reflections during authoring influenced the peer designer's work. Some types of feed-back correlated positively with the overall growth of a design partner's IDN, while other feedback types correlated with story content. When players suggested authoring techniques or other subjective experiences playing through the emerging IDN, their partner's designs expanded structurally (nodes and branches). When players shared negative evaluations, the partner's design did not grow. In comparison, player reflections that were cognitively orient-ed led to increases in story settings, while player affective expressions led to more character dialogue. Effects include increases in both IDN narrative elements and structure. Some effects correlate with participant gender and native language, although not with race/ethnicity. The study results offer in-sights about intersubjectivity - what is on novice player-designers' minds as they wrestle with interactive digital narrative authoring. IDN pedagogy can, thus, benefit from designer-player collaboration as students experiment with technical authoring tools, develop and employ relevant vocabulary, and interpret a player's feedback. Additionally, the Authoring-Other Exchange System employed in this study provides a framework and novel measures for future research and pedagogy.

"It's fun not to know": The Role of Uncertainty in Text-based Online Collaborative Storytelling

Alex Mitchell, Dennis Ang, and Shao Han Tan

Abstract: Computer-mediated communication platforms provide new ways for people to tell stories together, while at the same time introducing new challenges. In this paper we explore how people coordinate process, content, and direction during text-based online collaborative

storytelling. In our study, six pairs of participants were asked to tell a story together using two variations of a chatroom-like system. Both conditions provided direct text-based interaction visible to the audience, whereas one condition also included a "backchannel" interface for private communication that was not visible to the audience. The system also provided basic workspace awareness in the form of persistent story text, coloured based on contributor, and a typing activity indicator. Even with just a partial understanding of the content and direction of the story, most participants felt they were able to successfully tell a story together. In fact, some participants preferred the uncertainty associated with limited communication, seeing this as encouraging creativity. This suggests guidelines for designing collaborative tools, which tend to emphasize shared understanding, may need to take into consideration the role of uncertainty in creative activities such as collaborative storytelling.

Demo Presentations

RichCast: A Voice-Driven Interactive Digital Narrative Authoring System

Christopher Ferraris and Charlie Hargood

Abstract: We present RichCast a platform for conversational audio Interactive Digital Narrative (IDN). RichCast includes an accessible 'No-code' authoring tool, a community driven library of works, and voice interactive medium for interactive storytelling.

Storygraphia: the constrained authoring tool

Vincenzo Lombardo

Abstract: This paper presents the authoring tool Storygraphia, for interactive digital narratives. The editor is a graph-based editor that works with a story graph, augmented with metadata for tagging and agents. The authoring tool is oriented to the didactics of interactive storytelling and the major novelty is the implementation of classic constraints for the story engines, namely Propp functions, precondition-effect for story units, tension value.

A Demonstration of Loose Ends, a Mixed-Initiative Narrative Instrument

Max Kreminski, Melanie Dickinson, Noah Wardrip-Fruin, and Michael Mateas

Abstract: We present a demonstration of Loose Ends, a mixed-initiative creative interface for playful storytelling that assists players in managing plot threads to achieve storytelling goals related to high-level story structure. From a design perspective, Loose Ends is an example of a narrative instrument: an expression-oriented playable system that can be played to produce narrative, in much the same way that musical instruments are played to produce music.
