



HAL
open science

The Popular Memory Archive: Collecting and Exhibiting Player Culture from the 1980s

Helen Stuckey, Melanie Swalwell, Angela Ndalianis

► **To cite this version:**

Helen Stuckey, Melanie Swalwell, Angela Ndalianis. The Popular Memory Archive: Collecting and Exhibiting Player Culture from the 1980s. International Conference on History of Computing (HC), Jun 2013, London, United Kingdom. pp.215-225, 10.1007/978-3-642-41650-7_20 . hal-01455254

HAL Id: hal-01455254

<https://inria.hal.science/hal-01455254>

Submitted on 3 Feb 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

The Popular Memory Archive: Collecting and Exhibiting Player Culture from the 1980s

Helen Stuckey, Melanie Swalwell and Angela Ndalianis
Department of Screen and Media, Flinders University, Australia
Helen.stuckey@flinders.edu.au

Abstract. Memories of playing games with computers have an important role in terms of documenting people's personal relationships with computing history. This paper presents and discusses the Popular Memory Archive (PMA), an online portal of the "Play It Again" game history and preservation project, which addresses 1980s games, produced in Australia and New Zealand. As well as providing a way to disseminate some of the team's research, the PMA taps into what is, effectively, a collective public archive by providing a technique for collecting information, resources and memories from the public about 1980s computer games. The PMA is designed to work with online retro gamer communities and fans, and this paper reflects on the PMA as a method for collecting and displaying the memories of those who lived and played their way through this period.

Keywords: Computing History, Digital Preservation, Videogames, Games History, Online Communities, Fan Cultures, Museum 2.0.

1 Introduction

It can be difficult to engage people with the histories of computing who don't already have a personal investment in the story. Digital games offer a useful vehicle for talking about what might be regarded by some as a dry topic. Games were the way in which many people first came into contact with computers, particularly in the 1970s and 1980s, when games offered laypeople the chance to have playful and personal experiences with the then new micro-computers.

Since their inception digital games have developed a complex and layered history, which has left its mark on the memories of game players. Yet the dramatic speed with which game technologies (software and hardware) have developed and continue to develop renders game technologies defunct at an exponential rate, to the extent that game fans have become a significant resource for mapping game history. This paper discusses the ambitions of the Popular Memory Archive, an online exhibition and database being created as part of the Play it Again Project and how it aims to collect information, resources and memories from the public about 1980s computer games.

1.1 A Played History

Videogames are important cultural artefacts in their own right but they are also intrinsically tied to the history of computing. In reflecting on how audiences might

engage with the history of early computing it may be valuable to look at the importance that play has had in the story of computing and how playing games with technology has historically played such a significant role in both engaging users and showcasing emerging technology. Alan Turing famously wrote a chess program in 1947 before a computer existed that was powerful enough to run it [8]. This aspiration of creating a computer capable of playing chess was to be the goal for many early computer scientists working on Artificial Intelligence. From the beginnings of computing history games have often been used to demonstrate the capacity and accessibility of the incipient technology. In 1951 the Australian software engineer John Bennett wrote a version of the game “Nim” to showcase the Ferranti computer at the 1951 Festival of Britain. For the display Ferranti built a special “Nim” playing machine – Nimrod, with the number relays mounted behind clear perspex to demonstrate their workings and a panel with rows of coloured lights for the gameplay. Festival goers were invited to play against the computer and watch its mathematics’ ability in action. The demonstration was meant to show off the scientific prowess of the British computing company to the nation. The guidebook explained “*It may appear that, in trying to make machines play games, we are wasting our time. This is not true as the theory of games is extremely complex and a machine that can play complex games can also be programmed to carry out complex practical problems [8].*” In 1951 Ferranti understood the power of games to make computers relevant or at least exciting to the public. Later Bennett recorded his disappointment with a public who mostly just wanted to play rather than engage with the maths and science behind Nimrod’s electronic brain [3]. But no one can deny the impact that these early encounters with playing with the computer had on some people. Despite the fact that over half a century has passed since the public got to play with Nimrod, traces of the fascination it held for them can still be found online. A 2011 query to *The Guardian*’s Notes and Queries page includes a request from an unknown author who remembers playing “Nim”, as a schoolboy, at the Festival of Britain and wants to know what the computer was. He received two replies, one which perhaps would have delighted Bennett with its tidy description of the Ferranti’s hardware and operations whilst the other respondent speaks to the game, how it played, strategies for playing and confession of how as a 16 year old, he spent long hours at the display trying in vain to beat the machine [22].¹

1.2 Playful Memories of CSIRAC

Although the user group for these early monolithic computers was small the enduring fascination of playful engagement is a consistent theme of people’s remembrance of them. CSIRAC, now on display at the Melbourne Museum, is the only surviving first

¹ To celebrate the 50th anniversary of Nimrod hobbyist and early computing historian Peter Goodeve created a charming simulation of Nimrod where you play by manipulating the buttons on photographs of the original 1951 display. Goodeve states that the program is built like the original where the logic is performed by “Gates” and “Flip-Flops”. He explains that where he had access to detailed descriptions of the original logic he followed it almost exactly. <http://www.goodeveca.net/nimrod/simulation.html>

generation computer in the world. Built in Australia in 1949 it was the fourth computer built in the world. CSIRAC's immense scale and massive racks of valves clearly communicate to audiences at the Museum that this is a different beast than that which sits on their desktop: it is a metaphoric 'dinosaur', a wonder from another age.² It is not the hardware operations, however, that captures the public imagination. The stories that enliven the CSIRAC display are those of the personal and creative relationships that people had with the system. These include how CSIRAC's first programmer, software engineer Geoff Hill was able to program CSIRAC to play popular tunes such as "Colonel Bogey" which it would perform on public display in the 1950s.[4–6, 9] Featured also are the games that the teams created to play with the machine. Of particular fascination was the ability of operator Kay Thorne to beat the machine when playing Dick Jenssen's "The Way the Ball Bounces".[4] These narratives and the artefacts that accompany them, the music and the games, are able to communicate to contemporary audiences both a sense of the constraints that governed the operations of these machines and their creative potential. The ingenious ways that people found to make games using the simple input systems and displays convey some of the excitement that these individuals had in interacting with these early systems - playing with the machine and playing the machine. These artefacts express what happens when the principles of binary arithmetic and digital logic become more than mathematics and become an invitation to play.

2 Play it Again

The Play it Again Project which is the focus of this paper is not situated at the dawn of the computer age but rather at the moment when the computer found its way into the homes and hearts of ordinary people. It is designed to capture the memories of those people who played their way through the era of the first home computers. Play It Again is a game history and preservation project focused on locally-written digital games in 1980s Australia and New Zealand. It is a collaboration with the Australian Centre for the Moving Image (ACMI), the New Zealand Film Archive (NZFA), and the Berlin Computerspiele Museum. This paper presents and discusses the Popular Memory Archive being generated by the "Play It Again" team. The Popular Memory Archive is both a technique for collecting information, resources and memories from the public about 1980s computer games, and a way to display the results of the team's research into 1980s histories of digital game production and consumption. In this paper we discuss the Popular Memory Archive as a strategy for exhibiting and documenting the history of early digital games. This is based on the premise that there is cultural significance in these early encounters - like our friend whose unforgettable game of 'Nim' as a schoolboy in 1951 had him questing 60 years later to learn more about the computer he first played upon. And that these personal epiphanies and

² The use of the term "dinosaur" here is not meant as pejorative but the special value that dinosaurs have for museums where their breath-taking scale and ability to evoke wonder offers a sense of spectacle that make them perennial favourites with audiences.

remembrances can contribute to building a better understanding of the history of games and computing.

3 History of Production

The Popular Memory Archive seeks to balance a history of production, in the specific national contexts of 1980s Australia and New Zealand, with a history of use and reception. In researching the history of production, we have sought to compile information on as many locally-produced 1980s games titles as possible. The Play It Again project has identified more than 900 locally-written titles (700+ from Australia and 200+ from New Zealand). From this, the team has selected a shortlist of 50 or so titles which will be featured in an online exhibition.

Alongside this online exhibition, there will be an associated online program of ‘events’, in the form of a curated blog with a program of guests which changes monthly. Our selection of game titles for the shortlist has been conducted with this unfolding public program of guests in mind, to ensure that particular curatorial themes are illustrated. Curatorial themes include: the work of pioneering companies, including Beam Software; the rise of the bedroom coder; local scenes and local themes; legal issues for game archivists; and a focus on the collector. It is envisaged that these curated discussions amongst invited guests will draw out valuable reflections from them and attract contributions from others wishing to join the conversation.

Other criteria informing our selections of games are: important game designers; formal innovation/pushing technical limits; popular or nationally significant platforms; overall representation and balance; and consideration of the quality of the games. Selections have been informed by archival research, interviews and conversations with game designers, as well as systems we already have hard and software for. As much as possible, the project focuses on a breadth and depth of platforms, themes, and contrasting attributes.

4 History of Consumption

In seeking to understand the rise of the micro-computer and the cultural significance of videogames, the Popular Memory Archive moves its focus beyond a technology history to a history of use and interactions. This is in keeping with Patricia Galloway’s call for the importance of personal knowledge in comprehending personal computing [10]. It also echoes the observation Oudshoorn and Pinch make: “*Whereas historians and sociologists of technology have chosen technology as their major topic of analysis, those who do cultural and media studies have focused primarily on users and consumers*”[23]. Rather than understanding our object of study – 1980s games – as an archaeological and static object that exists in the past, we instead consider it as a dynamic form that continues to have a presence in game culture, living on through the energies of retro gamer communities and informing both contemporary game design and player cultures.

The Popular Memory Archive is centrally concerned with making links with a wider audience, and connecting historical research into early gaming with those who lived and played their way through this period. The collation of information about selected game titles is intended to drive the program and act as a prompt to elicit participation and materials from audiences.

Videogames are more than inert, digital code. Games theorist James Newman argues that the act of playing a videogame cannot be adequately considered or appreciated without a deep understanding of the ways in which it is enmeshed within and informed by its cultures and communities, all of whom contribute to the collective knowledge of videogame culture [19–21]. Recognising that game culture in the 1980s was highly participatory, hands on, and often characterized by a DIY ethic, the project aspires to create a history of games as they have been used and experienced. We want to hear about what people did with early computers and games: what games they wrote; what these games mean and meant to them, now and then; what records they have; and what difference their involvement with games made. For the duration of the Popular Memory Archive’s active life (expected to be around 18 months) users will be able to submit comments, images, video and other files to the site. Participation will be possible through uploading game capture, screenshots, photos, and the like. Participation will be encouraged through low barrier engagement such as “liking”, “played”, “owned”. We are also considering including a link to a more detailed set of questions that visitors could complete to provide richer information for other visitors and future researchers.

5 Fan Knowledge

Before detailing what we expect the Popular Memory Archive to deliver, we need to detour briefly to foreground an earlier (and still ongoing) phase of the research, namely our engagement with fan communities. It was fan communities who, years ago, took the initiative to document and preserve retro games, long before there was any institutional discussion on the cultural value of videogames. Operating outside institutional structures, such groups have been able to advance their work with minimal bureaucracy: they are agile, highly focused on what can be niche-fields of inquiry, and able to draw on the combined knowledge of large communities, who operate along gift economy lines [1, 2, 13, 14, 18]. Whilst many have also been involved with creating specialised techniques to help with game preservation, it is the collective intelligence that fans have of games which is of most interest to us in this context. Fans have knowledge about the playing of games, the played games and the played with game [7, 16, 19–21].

The research team, ACMI and NZFA recognize that much knowledge about the history of digital games is currently held by the gamer community. Elsewhere, we have reported on interviews conducted with two long time expert fan groups, Lemon64 and World of Spectrum, discussing the potential advantages in collaboration for both the Museum and fan groups [26]. In considering our approach to exhibiting information about - and seeking to collect documentation of - games, we have looked to the databases created by retro computer game fan sites such as Hall of

Light, World of Spectrum and Lemon64. Some of these sites have existed for nearly two decades and have evolved over time, refining their catalogues and the opportunities they present for engagement as the web has grown to support more complex data and more possibilities for participation. Having engaged in this protracted iterative design process, these sites have produced archives that strive to address the complex nature of videogames and also reflect how an active user community searches and engages with this material. Sites such as these - built around digitally native content by a digital literate community - provide excellent resources, operating as blueprints for memory institutions who are hoping to work with online knowledge communities to develop resources, share information and create a broader community engagement with the history of computing.

6 What we Expect to get from the Popular Memory Archive and the Significance of this

We expect the Popular Memory Archive to generate oral history-like fragmentary recollections from users, whether stimulated by the monthly hosted discussions, or spontaneous reminiscences. Depending on our audience - which we expect will comprise a mix of retrogamers, collectors, occasional players, and other users who are simply interested in the issues - we believe contributions are likely to have some particular qualities.

Fan discourse issues from a situated knowledge that is based on lived experience. Fans and players typically understand games as a set of experiences. Retrogamer sites - sometimes motivated by nostalgia and by a personal past with the software and hardware - often frame games in an intimate dialogue. For example the comments section at Lemon64 for “The Way of the Exploding Fist” (“WOTEF”) includes people’s memories of the first time they played “WOTEF” These focus not just on the game, but where and who they played with, the time it took for the tape to load and their first encounters with the infamous “Bruce Lee” scream on the loading tape.

Many retro game sites are platform specific and the romance of particular machines and their idiosyncrasies plays a major role in the hearts and minds of their user communities. Comments on such sites often offer a combination of personal passion and specific knowledge. “*Forget all that Street Fighter rubbish, this is a proper fight! Get the right move at the right time and that tension of knowing one blow could land you on your arse*” reflects [funky-springer] at Lemon64 on “WOTEF” in response to [melante]’s reminiscing “While IK+ (“*International Karate+*”) *can be even more fun thanks to the 3 player action, this was, and still is my favourite fighting games of all time (Street Fighter can’t hold a candle to this one) Besides, this was also responsible for making me start studying karate.*” These two comments situate “WOTEF” within a comparative discussion of the beat-em - of which it was one of the first for the home computer (the first karate simulation) - but they do so in the voices of people who cared, including one who was inspired enough by their experiences with the game to go and study karate [28].

6.1 Context

The Popular Memory Archive will deliver context, which is critical for creating an understanding of games for future users and researchers [17]. It can be difficult to appreciate the innovation and achievements of early video games as rapid technological change renders the most sophisticated features of 1980s games as crude to contemporary audiences. For example, the revolutionary sense of fluid control that “WOTEF” offered players through its intuitive mapping of the fight moves to the joystick is lost to a generation raised on the precision and speed of current peripherals. An understanding of both the social and material conditions of the consumption and reception of these early games is difficult to collect, preserve and display. Documenting player memories is one way to approach this dilemma and to record the experience of these games when their technology was state of the art and their designs were breaking new ground, offering new kinds of experiences.

6.2 Non-Traditional Archives

We believe that the Popular Memory Archive will yield a range of digital primary source materials and documentation, such as ephemera, images, and game capture. As part of our research, we have reviewed a number of Facebook communities who are using social media to reconnect and document their shared history. Two groups have particularly interested us: “Sharpies, Sharps and Skins a 1960-1970’s Melbourne Subculture” and “I got Drunk at the Crystal Ballroom”, a group dedicated to sharing memories of Melbourne’s punk and post-punk subculture of the late 1970s and early 1980s. In reconnecting these groups, these Facebook pages serve as ad hoc memory institutions, archiving photos and collecting both individual oral histories and shared conversations. The “Crystal Ballroom” users have uploaded photos and scans of ephemera, and post links to footage they filmed back in the day, as well as linking out to videos of the bands from the era. This visual archive is supported by individual memories and altogether the discussion documents a detailed family tree of Melbourne’s 1980s indie band scene. The collective remembering produces a richly-textured history, and a ‘tested’ one at that as people are quick to correct erroneous and boastful statements. The momentum created through these social media has also resulted in the development of more traditional archives. The “Sharpies” site, for example, has already supported the biography of one of its members and its user group are currently working on a book of images, short stories and biographies documenting Sharpie culture, with a second to follow³.

³ *Rage: A Sharpies Journal 1974-1980* by Julie Mac. Forthcoming *SNAP* an illustrated (100 photos) collection of small anecdotes and snippets from and about Sharpies sourced through the online community to be followed by the collection of longer pieces entitled *TAILS*.

7 Significance for the Museum

What is the significance of the Popular Memory Archive for the Museum? For some years, Museums have been inquiring how Web 2.0 can be used effectively to provide access and engagement with collections, and there are an increasing number of examples of institutions working with online communities. Galaxy Zoo, for example, invites hundreds of thousands of amateur astronomers to contribute to mapping the obscure corners of the universe. As detailed on the website, maintained and developed by the Citizen Science Alliance (which include partners NASA and Origins), “*the CSA works with many academic and other partners around the world to produce projects that use the efforts and ability of volunteers to help scientists and researchers deal with the flood of data that confronts them*”. What Galaxy Zoo’s ‘citizen scientists’ contribute to the project is not just data, but, through their forum discussions, they help crowd-source what is significant about the findings [24]. In this way the focuses of fan discourses help to build the cultural value of their subjects, and in turn contribute to shaping their value for the Museum [7, 15, 20, 21].

In thinking about how to engage with game history, the 2010 “Preserving Virtual Worlds” report identifies the important work of lay historians and their efforts in building online collections, as well as developing tools for emulation and preservation. The report proposes that one of the immediate steps that archives and museums can take to assist in the long term preservation of games is the development of systems that are accessible by, and can accept contributions from, the gaming community. Rather than being informed by a static view of game data preservation, the Popular Memory Archive offers an alternative model for documenting the cultural memory around early digital games. Lisa Gitelman reminds us that “*Despite the ubiquity of the phrase raw data... data are always already ‘cooked’ and never entirely ‘raw’*”. Raw data “*are the starting point for what we know, who we are, and how we communicate. This shared sense of starting with data often leads to an unnoticed assumption that data are transparent, that information is self-evident, the fundamental stuff of truth itself.*”[12] Gitelman posits understanding data “as a matter of disciplines” - from our perspective, that of games - and in doing so, a richer understanding of data as ‘cooked’ phenomena emerges. Rather than being understood as bits of information or “*abstract objects useful in the production of knowledge about the past*”[12] , in this project we reimagine the data we collate as a part of a collective phenomenon that extends to players. Through the collection of player memories we aim to activate this period of gaming history.

7.1 Moving Beyond the Object Focus

Operating online, the Popular Memory Archive already entails a shift beyond the Museum’s historic object focus. But the Popular Memory Archive will do much more than this. For instance, to pick up on an earlier point about fans’ passion, passionate voices are engaging in a way that the measured tones of the Museum are not. In examining the effects of “Discussion exhibitions” at the Science Museum, London, Ben Gammon and Xerxes Mazda note that one of the motivations for visitors to read the comment of others is that the emotive language of visitor’s comments is more

compelling than the display didactics [11]. In contrast to the careful neutrality of Museum language, the passion of the retro gamer and fan captures a sense of the lived experience and its importance to the user. Oral histories, even fragments thereof, provide a nuanced and embodied relationship with the work.

7.2 Reality Check

It is always tempting in the planning stage of a project to delude oneself by envisaging an ideal response. We are very aware that the idea of “*build it and they will come*” has not always served the Museum well as it has moved into the online space. And we are very aware that it has taken over 10 years for Lemon64 to amass its 98 comments on “*WOTEF*”. It is therefore our intent to work with these fan sites to collect and reuse relevant content related to our fifty selected games. This sourced material will be featured in the Popular Memory Archive with its curated “discussion” on Australia’s and New Zealand games history. This naturally opens up new preservation questions as the online digital preservation environment is a hall of mirrors, but that’s for another paper. There are additional challenges foreseen in a further ambition to offer ‘play in the browser’ versions of some of the games. This creates a series of technical challenges but also complex rights management issues as many of the work are orphanware, their publishing rights obscured by the volatility of the history of the games industry. In addition to these are the philosophical and quality issues for the Museum in providing an emulated experience.⁴ These include technical challenges but also rights management and the quality of, and philosophical issues regarding the authenticity of, the emulated experience.

8 Conclusions

The Popular Memory Archive is not just trying to reach new online audiences but to activate existing expert audiences whose memories and skills are needed to understand the games of the 1980s era. Games are, and were, a popular media form, and so we want to hear the voices of the community who played them. Ideally the Popular Memory Archive will reflect how an online exhibition/collection can blend the voices of game designers, players and retro computing hobbyists with those of the museum professional to produce a richer understanding of this era in computer culture. The Popular Memory Archive has the potential to engage the Museum in a more transparent process of meaning making, by placing on display the ambition to allow invested communities to shape narratives, become part of the information exchange, and work to directly build the archives. It will also, in turn, provide rich contextual content that helps new audiences make connections to these objects.

It is hoped that the online catalog/exhibition will offer more than a traditional static and authoritative catalog entry reflecting the more discursive, inclusive and

⁴ Further to the quality issues of emulation is a loss of control over what audiences are actually experiencing interacting with web based media whose performance may be affected by the set-up of the client machine.

questioning practice of exhibition and events [25]. We feel, however, that the significance of this project is to be found in the very possible scenario where games from this era stop working. Whilst “Play It Again” will be making it possible to play selected games from this era again without needing a sophisticated knowledge of emulators, if and when these games stop working, the Popular Memory Archive will have netted popular memories, together with ephemera, artefacts and other documentation. Whilst these memories may be fragmentary, told in different voices, together with different artefacts and documentation, they will allow future researchers to piece together a sense of what it might have been like to play these games in 1980s Australia and New Zealand.

8.1 Postscript

Whilst games were not always part of the official history of computers even the earliest computers had games played upon them. These early games help illustrate both how people interacted with these machines and often capture the zeitgeist of the times. At the conference one of the participants shared with the authors his memories of playing “Moonlander” on the DEC GT40, a PDP-11 using the light pen. What he remembered fondly about “Moonlander” was that a successful landing was rewarded with the discovery of a McDonald’s restaurant on the moon.⁵ This playful humour offered a quirky juxtaposition to the challenges of calculating deceleration on the physics simulator. The DEC-11 “Moonlander” was created by DEC consultant Jack Burness. An earlier text version of the game existed for the PDP-8 created in 1969 by Jim Storer when moon landings were a global obsession.⁶ “Moonlander” features strongly in people’s memories of the DEC particularly as it was one of the first computer games played with a graphical interface. It launched the popular genre of lunar landers for the arcades of the 1970s and home computers of the 1980s. [27]

Collecting and displaying memories of gameplay help contemporary audiences understand not just how that technology worked but how interacting with these systems could delight and enthrall their users. Stories of playing computer games are thus important in the history of computing because they speak to the creative and personal relationships users had with the technology.

References

- [1] Baym, N. 1999. *Tune In, Log On: Soaps, Fandom, and Online Community*. SAGE.
- [2] Baym, N. and Burnett, R. 2009. Amateur experts: International fan labour in Swedish independent music. *International Journal of Cultural Studies*. 12, 5 (Sep. 2009), 433–449.

⁵ The late 1960s saw McDonald’s restaurants proliferate across America with the introduction of their distinctive signage and architecture. In 1968 the 1000th store opened in the USA. The first UK McDonald’s opened in 1974.

⁶ The first moon walk occurred on the 20th June 1969 as part of the Apollo 11 NASA mission.

- [3] Bennett, J. 1994. Autobiographical Snippets. *Computing in Australia - The development of a profession*. J.M. Bennett et al., eds. Hale and Iremonger. 55.
- [4] CSIRAC: Australia's First Computer:
<http://museumvictoria.com.au/csirac/index.aspx>. Accessed: 2013-07-12.
- [5] Demant, D. 2010. Why the Real Thing Is Essential for Telling Our Stories 1
Museum Victoria. *History of Computing: Learning from the past*. A. Tatnall, ed.
Springer. 13–15.
- [6] Demant, D. and Tatnall, A. 2012. Institutional Nostalgia – Museum Victoria's
Cabinet of Computing Curiosities. *Reflections on the History of Computing*. A.
Tatnall, ed. Springer. 348–361.
- [7] Donahue, R. and Kraus, K. 2012. Do You Want to Save Your Progress?: The
Role of Professional and Player Communities in Preserving Virtual Worlds.
DHQ: Digital Humanities Quarterly: 6, (2012).
- [8] Donovan, T. 2010. *Replay: The History of Video Games*. Yellow Ant.
- [9] Doornbusch, P. 2004. Computer Sound Synthesis in 1951: The Music of
CSIRAC. *Computer Music Journal*. 28, 1 (2004), 10–25.
- [10] Galloway, P. 2011. Personal Computers , Microhistory , and Shared Authority :
Documenting the Inventor – Early Adopter Dialectic. *IEEE Annals of the
History of Computing*. 33, 2 (2011), 60–74.
- [11] Gammon, B. and Mazda, X. 2009. The Power of the Pencil Renegotiating the
Museum Visitor Relationship. *Exhibitionist*. Fall (2009), 26–33.
- [12] Gitelman, L. ed. 2013. *“Raw Data” Is an oxymoron*. MIT Press.
- [13] Jenkins, H. 2006. *Fans, Bloggers, and Gamers: Exploring Participatory
Culture*. New York University Press.
- [14] Jenkins, H. 2002. Interactive Audiences? The “Collective Intelligence” of Media
Fans. *Fans Bloggers and Gamers Exploring Participatory Culture*. (2002), 134–
151.
- [15] Kraus, K. 2011. “A Counter-Friction to the Machine”: What Game Scholars,
Librarians, and Archivists Can Learn from Machinima Makers about User
Activism. *Journal Of Visual Culture*. 10, 1 (2011), 100–112.
- [16] Lowood, H. 2007. Found Technology : Players as Innovators in the Making of
Machinima. *Digital Young, Innovation and the Unexpected*. (2007), 165–196.
- [17] Mcdonough, J. et al. 2010. *Preserving Virtual Worlds Final Report*.
- [18] Ndalians, A. 2009. Chasing the White Rabbit to Find a White Polar Bear: Lost
in Television. *ReadingLost: Perspectives On A Hit Television Show*. R. Pearson,
ed. I.B.Tauris. 193–310.
- [19] Newman, J. 2011. (not) Playing Games: Player-Produced Walkthroughs as
Archival Documents of Digital Gameplay. *The International Journal of Digital
Curation*. 6, 2 (2011), 109–127.
- [20] Newman, J. 2012. *Best Before: Videogames, Supersession and Obsolescence*.
Routledge.
- [21] Newman, J. 2008. *Playing with Videogames*. Routledge.
- [22] Notes & Queries: Speculative Science: 2011.
<http://www.guardian.co.uk/notesandqueries/query/0,-1958,00.html>. Accessed:
2013-07-08.

- [23] Oudshoorn, N. and Pinch, T. 2003. Introduction: How Users and Non-Users Matter. *How Users Matter The CoConstruction of Users and Technology*. N. Oudshoorn and T. Pinch, eds. The MIT Press. 1–25.
- [24] Owens, T. 2013. Digital Cultural Heritage and the Crowd. *Curator: The Museum Journal*. 56, 1 (Jan. 2013), 121–130.
- [25] Srinivasan, R. et al. 2009. Digital Museums and Diverse Cultural Knowledges: Moving Past the Traditional Catalog. *The Information Society*. 25, 4 (Jul. 2009), 265–278.
- [26] Stuckey, H. and Swalwell, M. Retro-Computing Community Sites and the Museum. *The Handbook of Digital Games*. H.A. and M. Angelides, ed. IEEE/Wiley.
- [27] Technologizer Forty Years of Lunar Lander: 2009.
<http://technologizer.com/2009/07/19/lunar-lander/>. Accessed: 2013-07-09.
- [28] The Way of the Exploding Fist - Comments:
<http://www.lemon64.com/?name=way+of+the+exploding+fist>. Accessed: 2012-08-12.