

# AI/VR: situated animation in the Library of Babel

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## ABSTRACT

If cinema represents the ‘most replete and consuming instance of an interface for dreaming’ [1], what more can we expect of virtual technologies and Artificial Intelligence, or indeed, of computation in general, to create animated works that surpass our longstanding, heterogeneous, heritage of time-based visual media? The promise of VR and AI is arguably that of an ontological and ethical shift, one that takes us closer to a posthuman animation.

Through a practice-based research process the author reports on the ways in which a VR/AI work, ‘*Return to the Library of Babel*’ [2], deploys procedural animation and emergent spaces, engendering a dynamic, animated realm, one of situated, emergent, subjects and objects, within what Sara Ahmed frames as a political economy of, and, one might add a logic, of ‘disorientation’ [3].

**Keywords:** VR - Artificial Intelligence – Situated Computing - Embodiment.

## 1 INTRODUCTION

If current hype around AVR is to be believed, then we should soon expect to be inundated by animated virtual literary works and immersive experiences, phenomena which will surpass the ability of traditional book and cinematic forms, capturing human attention and amusing or moving us in an unsurpassable suspension of disbelief (see hyperbolic claims such as those in Scoble & Israel [4]), and yet, at present, decades, and arguably centuries [5],[6], into the existence of VR technologies, the titles of such works hardly spring to mind, or, more accurately, have not generated a pervasive cultural presence. Where are those works, and do they really threaten or augment our long history of oral and written, as well as traditional (non AVR) animated narratives?

The author’s work as a technologist and arts practitioner, as well as a teacher of programming and creative coding, within both U.K art schools and traditional computing departments (Goldsmiths, the Open University, the University of Derby, the University of the Arts and the Royal College of Art) has sought to identify the chances and challenges of computational, animated, time-based content in artificially intelligent as well as AVR environments, adopting an interdisciplinary and intermedia approach, at the intersection of games, film, theatre and fine arts.

McLuhan famously stated that instead ‘of scurrying into a corner and wailing about what media are doing to us, one should charge straight ahead and kick them in the electrodes.’ [7], VR seems to be a case in point for this approach, with opportunities for animators and fine artists (among many other practitioners) to explore the inherent characteristics of VR, instead of merely amplifying existing forms, superimposing them onto 360-degree environments, without engaging with the medium and ontological specificities of this emerging form. VR, combined with Artificial Intelligence is an opportunity for practitioners to re-conceptualise animation and wider time-based media, an opportunity to originate models of interaction which are aware of specific locations and individual subjects, to engage with the entangled politics of situated space and identity.

‘*Return to the Library of Babel*’ is a work in progress, an

animated VR narrative which deploys AI techniques to create an experience which is different every time a ‘user’ (reader, viewer or player) interacts with the work. It is the continuation of the author’s fascination with and longstanding work exploring Borges’ short story *The Library of Babel* [8]. This work began, for the author, in 2004, while studying sound design at the London College of Printing; for that first project the author created a virtual library of Babel, using the now deprecated software package, *Director*. The work was, by today’s standards, rather limited, with users clicking on objects to navigate through a library of animated books, while listening to or activating accompanying sound tracks.

The author’s more recent work, is technically far more complex, using Unity 3D, the Google VR (Cardboard) SDK for and the C# programming language, to create a dynamic setting, an almost infinite library, with  $n = 22$  permutations, (plus the space, the point and the comma symbols) the resulting textual possibilities, most of which are, inevitably nonsensical, are  $1.1240007278e+21$  in number, an interface to these combinations is re-generated each time a user runs the application.

The *Babel* software is viewed within a mobile phone, enabling users to explore an ever-changing context using their gaze and head movements. At the same time, Borges’ mysterious *Man of the Book*, autonomously navigates the vast hexagonal library structure depicted within the story. The *Man of the Book* can be viewed by participants from a god-like perspective, hovering high above the virtual space of the library, as he endures both boosts to his energy as well as fatigue and hunger, or he can be encountered from the ground, as a threatening presence or a fellow traveler. Such shifts in perspective are extensions of cinematic powers to distort and transform scale, but seem even more profound within 3D environments, in which it is possible to create 360-degree sense of being minuscule or huge, to see the World from within, for example, a wine glass, and, with the aid of binaural headphones, to experience, at the same time a soundscape generated from within that glass.

But beyond the novelty of a procedurally generated environment, immersive soundscapes and intelligent virtual actors, the work also seeks to take a situated turn, one that does not resort to the current VR rhetoric of immersion or empathy, but instead, one that operates within a discursive space, in which those who engage with the Babel environment are invited to investigate their own phenomenology of space and perception, whether it is one of nauseating restriction [9], or privileged mobility. In this sense the work is presented as epistemic and agential, a research encounter between emergent objects and subjects within contingent networks of meaning.

## 2 THEORY

All knowledge, according to Nelson [10], among many other post Cartesian epistemologists, is connected to larger systems of theories and notions of evidence, situated within specific cultural and social contexts:

Standards of evidence and knowledge are historically relative and dynamic and of our own making. They are inherently and necessarily communal. [11].

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In stating this, Nelson is not arguing for a relativist position, but presenting a credible and topical argument for what might also be thought of, in computational or artificial intelligence terms, as distributed or ambient intelligences, bottom-up models of knowledge production that are relational and fluid, rather than top-down *a priori*, rule-based systems of thought. As such Nelson's model of epistemological communities is one that appears to have some relevance within the context of the author's VR practice.

In placing communities and inter-relationality as primary epistemological agents, Nelson is providing a pragmatic model for sourcing subjective meanings within an animated VR system, a system which seeks to recognise, and indeed, be fueled by, what Nelson describes as an 'inherent circularity' or relational flux [12]. Likewise, Barad [13] positions knowledge as emerging though embodied, temporally and materially specific, *intra-actions*, relational moments of meaning in which outcomes are not pre-determined or fixed.

Barad extends Bohr's attack on Cartesian subject-object boundaries, through her notion of *agential-realism*, a form of knowledge production that is grounded in actions and a belief in material realities. Barad considers agential realism in light of specific considerations, including feminist ideas of performativity and the 'production of bodies, identities and subjectivities' [14]. These ideas as well as the ideas of Ahmed [15], Braidotti [16] and Wolfe's [17] work on posthumanism, have been important in reformulating the author's more recent work on the *Library of Babel*. In the recent work, participant viewers/players engage in a shifting set of power relations with the *Man of the Book*. Users can try to support him or starve him, work him to death or work with him to negotiate the library of Babel. The *Man of the Book* also has agency, as well as virtual needs and embodied states, he endures hunger and fatigue, and will react to the perceived quality of engagement with his human companions within the emergent space of the *Library of Babel*.

## 2.1 Emergence

It is important to clarify that the author does not have any commitment to or interest in the notion of virtuality or emergence for its own sake, rather, a commitment to systems that (wherever possible) try to eschew predefined boundaries between users and contexts, or society/individual dualisms; a form of contingent meaning-making that is closer to the description made by Kember in relation to Artificial Intelligence and *ALife*, in which emergence is characterised as 'based on a non-linear, non-deterministic model of connection or communication between multiple rather than individual units' [18]. In *Cyberfeminism and Artificial Life*, Kember discusses the limitations and structures of artificial agents, including Rodney Brooks's downsized 'dumb' mobile robots, or multi-agent system, which *en masse* might constitute a 'political economy of information systems' [19]. Brooks' mobots eschew symbolic internal models and have instead adopted a networked intelligence or 'subsumption architecture'. Though this is an interesting break from the symbolic models of traditional Artificial Intelligence it is, pragmatically, an apparently limited architecture, one that is hard to deploy within an animated narrative.

Kember also discusses the disappointing limitations of 'trick' conversational agents or *chat bots* such as Eliza and Julia, that have limited repertoires of static responses and no capacity to learn or analyse their own reactions let alone act in situated awareness of an environment. More recent conversational agents such as *Siri* and *Alexa* have a laughably limited capacity to engage in complex conversation. *The Man of the Book* does not attempt to talk with humans, 'his' communication is embodied, enacted and

performed as he moves through the library. One of the HCI issues of interest to the author is the 'best practice', human paradigm that habitually reverts to face-to-face intra-human experience, as the ideal form of interaction, placing, for example, the intra-human flow of a chat site above the 'question and response' pattern of an online bulletin board' [20]. These anthropomorphic value judgments do not always seem logical or necessary but as Lister et al point out, the anthropomorphising sensibility 'inflects the whole idea of interactivity by lending it a context of person-to-person connection.' [21] But, increasingly, we may find ourselves in encounters with artificial intelligences, ones that are programmed to have their own, situated needs and intentions, reflected and embedded in their animation and animus. Above all, the author wishes to avoid falling into an entrenched position in regard to the architecture and sensibility of VR systems, to stay open to new possibilities, that do not just project older forms and expectations onto newer technologies.

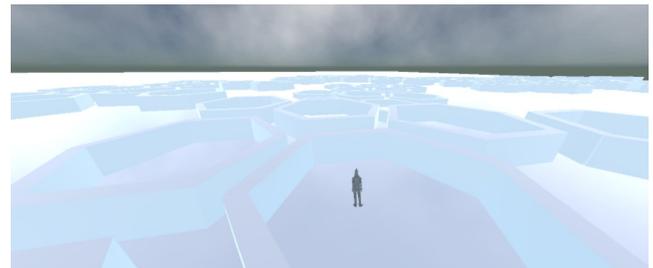


Figure 1: The Library of Babel.

## 2.2 Restructuring interactivity

*Return to the library of Babel* extends the author's doctoral work on intelligent books, it is grounded in a reconsideration of the ways in which interactivity can be deployed and defined in animated, intelligent books, for example, decentralising the notion of individual user choice in favour of more collective processes and less overt or conventionally individualised forms of 'user' control. Wherever possible the author's own partiality of perspective, in the form of rules embedded in the code, can be examined and, where structurally possible, changed or commented upon by user/reader actions. Within recent and future digital systems, Haraway's notion of situated knowledge [22] (and also Nelson's related conception of communal epistemologies) still emerges as the most viable epistemological alternative to the problematic, disembodied, 'Cogito', pragmatically, ethically and theoretically.

Haraway's notion of situatedness is extended and supported by Suchman [23] who challenges orthodox notions of the boundaries between subjects and objects and writes of the 'reconstructive engagement with received conceptions of the human, the technological and the relations between them' [24]. Suchman's exploration of such issues within the domain of robotics and artificial intelligence has led her to a position which emphasises sociality 'in strong contrast to prevailing models of the individual cogniser as the origin point for rational action'[25]. Between Suchman, Barad and Haraway new epistemological theories are available to us, and, through the materials and processes of an informed practice, new computational systems of animation and production can be conceived.

## Conclusion

Within the heterogenous domain of animation, animated, immersive books will almost certainly become more prevalent, and yet, is there anything as immersive as an analogue book? If current hype around AVR is to be believed, then we should soon expect to be inundated by animated virtual literary works and immersive experiences which will surpass the ability of traditional book and cinematic forms, capturing human attention and amusing or moving us in hitherto unimagined ways, and yet, at present, decades into the existence of VR, such works do not pervade, and have not generated a lasting cultural presence. We still might ask ourselves: where are those works, and do they really threaten current animation practices, or promise to significantly augment our long history of oral and written, as well as animated, narrative?

For the recent resurgence of interest in VR to avoid disappearing into yet another hype cycle, we must seize the opportunity to reformulate our understanding of what knowledge is and who produces it. It is an opportunity to integrate the body into new epistemologies and methodological approaches, in which a contingent, culturally situated, and machine learning based system is a more apposite model for embedding posthuman, discursive subjectivity into VR architectures and animations. Without a significant restructuring of what it means to interact and encounter artificial worlds within virtual reality (and also augmented and mixed realities), it is hard to see VR emerging as an enduring cultural form.

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