

Music for Alice Dali Augmented Reality Experience: Multisensory Design Soundscapes for Locative Mobile Phone Gaming (via Synaesthesia)

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ABSTRACT

Composing music for digitally enhanced realities (AR/VR) requires synchronisation of the audio and visual design efforts. The recent book *Multisensory Experiences: where the senses meet technology* (Velasco and Obrist, 2020, p. 70) pointed out the necessity of following the multisensory nature of perception. In this project, our core hypothesis is that the quality of locative Augmented Reality (AR) Art/Music experiences can benefit considerably from improving the associated design processes, specifically by adopting multisensory design practice modelling synaesthesia in composing music for visual image. This paper offers insights into methodology of multisensory design soundscapes for Augmented Reality Alice Dali experience, based on 12 images painted by Salvador Dali for an 1873 special edition of Lewis Carroll's book "Alice's Adventures in Wonderland." Music composed by Svetlana Rudenko interprets the Art shapes of lines, characters and emotional perception of colour into musical textures and genres. The narration of text by Mads Haahr adds a verbal component into the AR soundscape. Research on artificially induced synaesthesia has shown that "cognitive training including synesthetic associations may in the future be a promising new tool for vulnerable clinical groups to enhance general mental ability" (Bor et al, 2018). For this reason, multisensory design applications based on a synaesthesia model might have a very promising potential for training creativity, thinking outside the box, education and mental health. The Augmented Reality Alice Dali app will be available for download for free for Android and iOS.

Prototype: <https://rebrand.ly/alice-dali-ar-prototype>

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1. SYNAESTHESIA AND CREATIVITY FOR DIGITALLY ENHANCED REALITIES: MULTISENSORY DESIGN – EXERCISING THE BRAIN IN A MULTISENSORY WAY

Ramachandran and Hubbard stated that "[S]ynaesthesia causes excess communication amongst brain maps... Depending on where and how widely in the brain the trait was expressed, it could lead to both synaesthesia and to a propensity towards linking seemingly unrelated concepts and ideas – in short, creativity" (Ramachandran and Hubbard, 2001, pp. 1–33).

1.1 Lessons from Synaesthesia. Visual Experience of Music. Synaesthesia Gallery AR.

Synaesthesia is a peculiar wiring of the brain, characteristic of sensory pairings, when, for example, sound could be perceived as colour, shapes or other sensations. In our recently published app Synaesthesia Gallery AR¹, we captured 15 Music Art soundscapes in which Music was painted by artists-synaesthetes.

The human brain has much bigger interaction/sensory cross-talk than previously thought. The nature of the human conscious experience, the way we perceive the world and ourselves, is a multisensory and embodied experience (Anil Seth, 2017). At the same time, the brain constructs its own reality. Cretien van Campen: "A mysterious aspect of color is that it is created in the brain and seen to exist in the physical environment. But the physical environment contains only light waves and is in fact colorless. The colors are inside our brains, not outside" (Van Campen, 2010, p. 118).

Synaesthetic experiences are involuntary, but it is a creative practice of artist and mastery to craft these sensory experiences into art:

[R]egardless of the synesthetic trigger, that sometimes the colors are translucent like a haze of smoke or fog; sometimes they're dense with a weight that feels almost physical. The shapes are soft-edged, exist in space, and are three dimensional but cast solar system. The backgrounds move too, and can be black or white or highly saturated color. We agree that what is seen can appear suddenly, and that shapes can move around together like members of an agreeable herd. Other times a single shape appears like an unexpected overlying splash of color. The speed of these moving shapes is gentle. They go as fast as the changing color waves of aurora borealis appear to the naked eye. (Steen, 2008, pp. 17–26).

Art is a visual experience, but we perceive it not only with visual sense but emotionally too according to our subjective personal experience. For synaesthetes, this experience is even stronger according to their sensory pairings wiring.

For me (Svetlana Rudenko), music has always (through 20 years of professional experience as a concert pianist) been visual, associative and full of characters. I do not have chromesthesia (colour to sound synaesthesia), but I do perceive musical texture as a 3D sculpture or moving landscape of sounds with which I play like "play dough" during the performance². In reverse, visual experiences of art, emotional perception of colour, line shapes and characters, bring me musical textures and genres. In section 2 is a description of the process of design and composition for Alice Dali AR.

1.2 AR concept: augmentation of location with Art and Music. New Genre - Gallery Game

Traditional Art Galleries are inside and without music. Our novel concept of Open Air Gallery AR for families is unique as a collective experience for group cultural entertainment. To our knowledge, it is the first time an Art Gallery has been offered as a locative game. The audience/player follows the game's radar to find the music art encounter, then switches to AR mode to find, view and capture the artwork. The area of your Gallery Game is marked on the in-game map. The music art episodes are structured into three fields: three groups of artworks with five in each (Synaesthesia Gallery AR) and three groups of artworks with four in each (Alice Dali AR). You only proceed to next group when you have found all art encounters in the current group.

¹ Free download: <https://rebrand.ly/synaesthesia-gallery-ar-download>

² 4D visualisation of musical-space synaesthesia: <https://vimeo.com/232331357>

On the topic of play experiences, Mayra and Lankoski observe: "In games and play, human experiences are organised in a particular way. This framing is a starting point that underlines the specificity of play experiences and is closely related to the "magic circle"- a concept first introduced in Johan Huizinga's *Homo Ludens* (1938/1955) and later established as the key concept to address the boundaries that separate games from the "ordinary life" (Mayra and Lankoski, 2009, p. 130). The Gallery Game creates a "magic circle" of art and music in the chosen area of play; it lets you expand your experience of a walk in the park into an augmented reality cultural experience³.



Figure 1. Playing Synaesthesia Gallery AR in the park

2. SOUNDING ART COMPOSITION PROCESS: MULTISENSORY DESIGN SOUNDSCAPES FOR ALICE DALI AR

Salvador Dalí was commissioned to illustrate the 12 chapters of Lewis Carroll's "Alice's Adventures in the Wonderland". His imagery created the stylistics and art composition in his characteristic style. In my (Svetlana Rudenko's) journey, I tried to perceive his art emotionally, in an attempt to hear what he saw in Alice's story, reflecting not only on verbal content, but on the atmosphere of the paintings and the perception of the characters musically – to transpose the experience of one sense (in this case, visual) into another (audio, music). This is the main principle of multisensory design, to be able to view information through/with another sense. It is also the main principle of creativity: the ability to see new combinations, hitherto unknown and out-of-the-box solutions.

2.1 Components of audio-visual design. General principle.

Louise Harris, audiovisual composer, University of Glasgow, created the concept of "thinking audiovisually" (Harris, 2022, p. 9) for digital music. She pointed into elements of audiovisual composition: "...consideration of the elements of the composition process as it exists within music, visual art, film, photography and dance. It will then look to find ways to reconcile these elements into single set of characteristics for consideration in audiovisual composition" (Harris, 2022, p. 73). She calls it "linguistic framework" and components of music composition: pitch, rhythm, tonality, harmony, shape, form, structure, timbre, texture (Harris, 2022, p. 76), as well as "Elements of art: line, shape, form, value, space, colour, texture." She specified "principles of

³ For more information, please see: www.openairgalleryar.com

design: balance, emphasis, movement, proportion, rhythm, unity and variety" (Harris, 2022, p. 77). Further, Svetlana will unfold the process of design and composition.

In Dali's paintings/illustrations, Alice is always present – a small figure silhouetted in black with a skipping rope and a shadow. This connecting element, in the musical cycle, is a waltz 3/4, symbolising Alice, with spontaneous passages and interrupted phrases as a "childlike" speech.



Figure 2. Poster of Alice Dali AR for FENS Neuroscience Forum staging in Paris

2.2 Translating chapters art into musical genre: characters. Elements of musical language.

The first episode CH1 *Down the Rabbit-Hole*. Waltzing with a Rabbit E flat major. Further into the Gallery development, the Waltz Alice appears in CH5 *Advice from the Caterpillar* after the "hallucinogenic" caterpillar theme, and in CH 8 as a reminiscence of the encounter with Duchess and piglet (CH 6 new modulated Waltz like theme).

CH 2 *The Pool of Tears* is in A-minor, dramatic sad key as it is about Alice's own critiques of herself and "pool of tears" painted by Dali in a flood of green-blue colour. The time-signature is $\frac{3}{4}$ also, as Waltz became Alice's leitmotiv.

CH 3 *A Caucus-Race and a Long Tale* starts in C-major with nostalgically mildly dissonating harmonies – a "wet queer-looking party" (Carroll, 1865, p. 26) with later bright E-major in 4/4 with fragmentarily reminiscing tango rhythm in melody part, when Dodo suggested Caucus-Race. Dali's palette here is surrealistic.

CH 4 *The Rabbit Sends a Little Bill* is in a C-major key. The motion of semi-quivers reflects on the panic of Wonderland characters seeing a giant (Alice's!) arm in the House, sudden harmony clusters interrupting the flow of motion.

CH 5 *Advice from a Caterpillar*. Hallucinogenic E-flat minor pentatonic beginning, later reflecting on characters with music quotations from previous chapters: Alice's Waltz and the Rabbit Theme.

CH 6 *Pig and Pepper*. It starts in the mystery of "Twin Peaks" woods, G-minor key, as the story

of the baby-pig is not for the soft-hearted... Later, the music is in F-major key and Waltz as Alice gets back to her natural common sense, and some Nocturnal episode in G-minor.

CH 7 *A Mad Tea-Party* is in Habanera genre, 4/4 and D-minor key, with repetitive clusters symbolising the tick of Dali's "melting" clock.

CH 8 *The Queen's Croquet-Ground*. The Queen's threatening theme is in 4/4 and E-minor. Waltz in F-major as White Rabbit appears, Alice's Nocturne of empathy in B flat major, and the game of croquet in D-major. The kaleidoscope of keys reflect on the absurd/humour of the game.

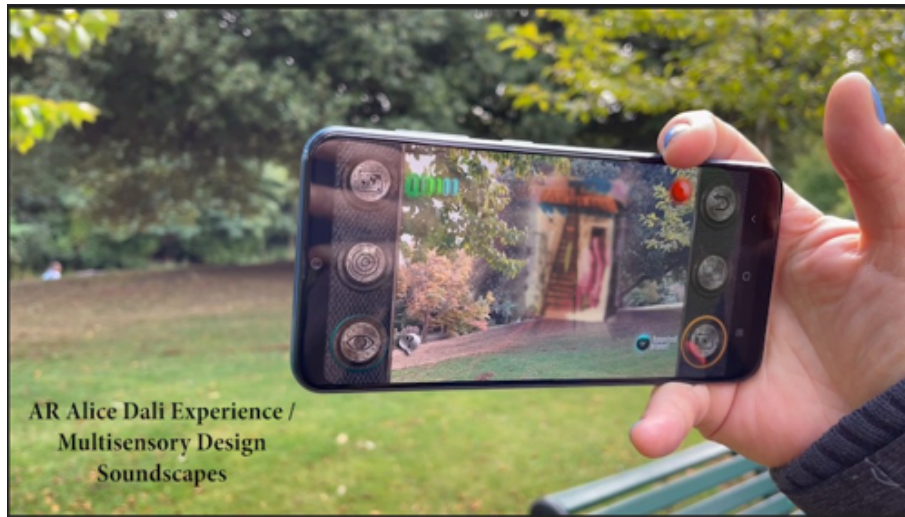


Figure 3. Prototype of Alice Dali AR

3. ALICE DALI AR EXPERIENCE DESCRIPTION: THE APP

The experience is set outside, through a smartphone screen. The first step is to download the app from the Play Store (Android) or App Store (iOS). The app is free and free of advertising. When the app starts, you can choose "Random" to play in your local location, e.g., a park. The steps to find and capture a music art encounter is as follows:

1. Use the map (top left button in figure 3) to orient yourself and make sure you are inside the purple area where the music art encounters are.
2. Use the radar (middle left button in figure 3) to get close to a music art encounter. It works like a naval radar where you are in the centre and the music art encounters are around you. As you get closer to an encounter, you will hear the music begin. You should keep going until the LEDs light up and the AR button (lower left button in figure 3) flashes yellow.
3. Use the AR mode (lower left button in figure 3) to scan around you and find the artwork hanging in the air. The yellow arrow on the display tells you which way to pan. When you see the artwork, capture it by taking a photo (lower right button in figure 3). If the artwork disappears before you can capture it, go back to step 2 above and move a little bit closer to it.

The captured artworks go into your gallery book (middle right button in figure 3) where you can review them and read more about the artwork and the music. When the music finishes, you can proceed to find the next music art encounter, beginning with step 1 above.

The soundscape episodes are compact miniature music pieces with a total length not more

than 2 min 30 sec. The brevity is intended such as not to distract the flow of the game and the momentum of the play experience. A fun part of the experience is to frame the photos of the artwork nicely against surrounding elements and people.

4. CONCLUSIONS. HYPOTHESIS. FUTURE PERSPECTIVES.

Augmented reality experiences allow a hybrid reality of imaginative and real experiences to merge, to extend a fantasy world into the real, training the brain to "see" more. In this sense digital technologies facilitate creativity training, in our case augmenting your walk into a cultural gallery excursion. Taking lessons from synaesthesia, the knowledge of how one sense could be perceived with another or modelling sensory pairings and how experience could be transpositioned into another sensory modality with a help of artistic craft. The result is an experience that integrates multisensory design into game design. Hear and see more.

Art Music AR experiences can provide a stimulating environment for multisensory entertainment and learning as well as a pleasing aesthetic experience to support interest and engagement. In addition, it is a cultural excursion to one of greatest surrealist artists Salvador Dali, in this amazing journey for children (as directed in Lewis Carroll's book) but not limited by age (adults are very welcome!). This novel experience of art perceived through music with the tool of Augmented Reality, is a promising platform for a new type of cultural experiences, encouraging healthy family entertainment. Such activities directed to multisensory stimulation of the brain could form more established neuronal pathways to "cross-talks" and creative minds.

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