

## Challenges creating Artificial Natures

**Matthias Buehler**

MSc Arch ETH Zürich, E-Mail: [www.vrbn.io](http://www.vrbn.io), [matthias.buehler@vrbn.io](mailto:matthias.buehler@vrbn.io)

### Abstract

*Our work on the exhibition ‘Artificial Natures’ at the Architecture Biennale 2018 in Venice had its challenges. Our responsibility was the creation of the main 3d worlds, for projection onto the ‘Triptych’ and the ‘Arcades’.*

*The focus is on five points that all heavily influenced the project development and understanding of dynamics in interdisciplinary teams in a creative process.*

*Keywords: 3D worlds, architecture, design*

Manuscript received 22 November 2018, revised 01 October 2018, accepted 7 December 2018.

Copyright note: This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided that the original work is properly cited.

### 1. Developing the visual style

Once the *worlds* we show were decided upon, the next question was on how. The technical framework was relatively clear, by using 3d tools such as CityEngine and Unity. The challenge was rather in finding a visual style that is flexible enough to depict a multitude of worlds with different characters, but still similar enough to feature a consistent look that allows the worlds to be comparable.

The 5 worlds shown (Burle Marx Park, Tel Aviv, Terrace World, Sforzinda, Freedom & Form) have a quite different character each, therefore developing some sort of common visual language was key.

We decided to go for a somewhat abstract look that features white as the main color for architecture and the infrastructural elements. Further elements such as geometric patterns, water bodies, vegetation or important conceptual points are designed colorful.

One of the breakthrough elements we invented were the *pixels*: Mainly quadratic polygons that allow for a visual abstraction of certain elements that are conceptually clear to the human eye immediately, such as for example:

- Large grey pixels in the background: Skyscrapers or ziggurats
- Large green pixels in the background: Patches of forest
- Green or colored pixels in the foreground: Hedges or patches of blooming plants



Figure 1. Terrace world, vrbn

The pixels were originally developed in a form finding process for the different 3d vegetation models. In total, over 25 different models of vegetation were created, each with 3 variants of lightness and saturation. Each vegetation model further features multiple levels of detail (LODs), for use in Unity to tame the polygon count in each world.



Figure 2. Vegetation, vrbn

## 2. Multidisciplinary terminology & references

When working in a team of architects, historians, artists and programmers, exchanging thoughts and developing ideas can be (or is) a big challenge.

Each member has a different educational background and cultural understanding regarding understanding space. Each member further has their own taste and preferences. This can lead to misunderstandings, especially in the conceptual phase.

There is no common universal language available that describes spatial qualities. With Artificial Natures as the core topic, for the more theoretical discourse, it's easiest to find references to compare and find commonalities that everybody likes and would like to pursue.

To me personally, the journey of aligning the common vision and understanding of Artificial Natures (for each member individually) was the most interesting challenge, as it demanded to develop a refined sense for understanding and analyzing other member's vocabulary, use of terminology, examples and general patterns of how they understand and qualify space.

Analyzing the *little deltas* in the reaction and reflection (like some sort of sonar system) from the group to stated thoughts (from naïve to deliberately provoking) worked best for me, even though this process is time consuming.

## 3. Visions of scale & conditions of space

Spaces can be small, but worlds need to be vast. The sense of scale was paramount to developing our worlds and making them believable in their own nature.

Guessing and communicating spatial dimensions is something that is quite complex and often off by factors. It seems this is a skill that needs to be learned and is not naturally given to humans. When designing worlds, this is of course a source for sub-

stantial misunderstandings, especially at dimensions typically beyond walking distance. This is of course influenced by the complexity of the general infrastructure layout, e.g. small organic alleys (medieval towns) vs. monumental axis (Brasilia).

Further, the 3d component of spatial perception seems to universally help in understanding space. Guessing dimensions from maps (2d) seems to be hard to the human brain to process without extensive training.

An example is a satellite map of a refugee camp in Iraq, with the according 3d reconstruction: There is much more complexity behind understanding space than just its raw spatial dimensions. The *condition* of the space, for example the social, economic, political conditions of a space matter enormously in understanding a space, as shown very intensely in the example of the unimaginable size of the shown refugee camp.

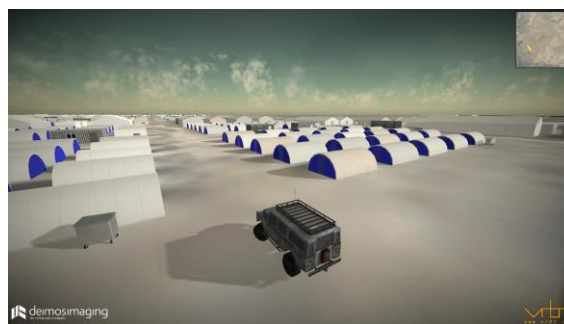


Figure 3. Game Experience, vrbn

## 4. Visual & harmonic appeal vs. concise & clear system

It was important to address the balance between (visually) explaining the general system (the mechanics of an Artificial Nature working) of a world, compared to just showing an unfolding world.

Each of the worlds we have constructed could be conceptually explained using a couple of abstract sketches. But typically, especially in an art exhibition and when wanting to show beautiful and complex worlds, this is not rich enough. Therefore, we had to find a good balance of formal, visual and conceptual elements for representing each world.

## 5. Believable space

Lastly, and most importantly, it was important that the worlds look believable. Believable in the sense that we can relate to the space shown and see it as *beautiful* (proportions, ...).

It's important to me to note that the term *believable* does not prerequisite any deeper knowledge about architecture (e.g. classical column orders) or history for that matter. Anybody experiences the worlds on their own. There are no clear rules about the believability, only tendencies.

The key to the Artificial Natures displayed is a general *positive resonance* that one feels when seeing the worlds. It's hard to describe, but that feeling is a mixture between hope, meditative calmness and peace.

### Conclusion

Altogether, developing the 3d representations of the worlds exhibited was challenging: How to tell a complex story using a simple visual language that is commonly understood and received well. The Ideal Spaces Working Group will build on this rare experience and knowledge base for future projects.

A big thank you goes out to Ulrich Gehmann, who made this all possible.

