Atomized (algorithmic) Functioning

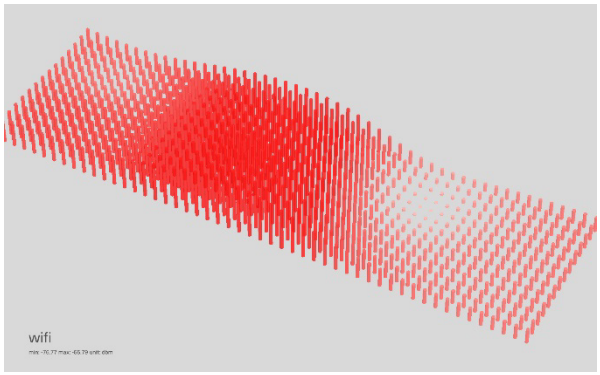
2018

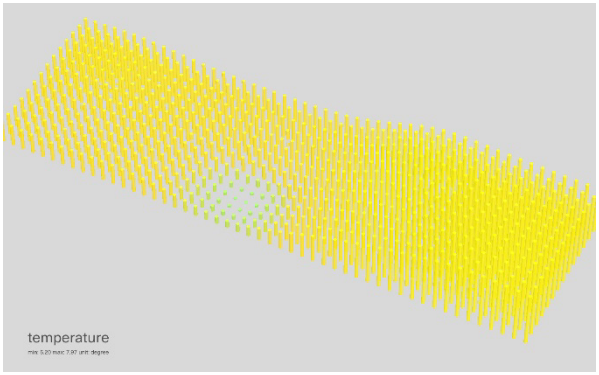
Architectural software & project by fabric | ch

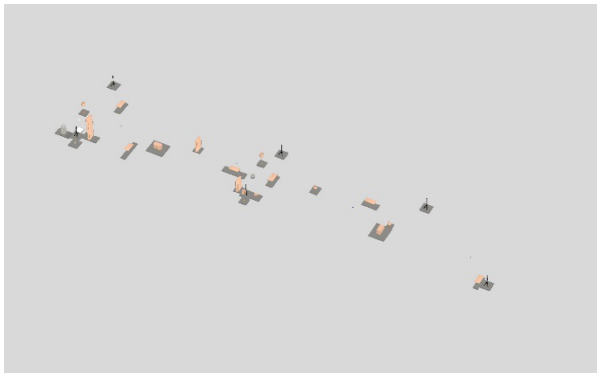
Internal research. Developed, used, customized, and presented through exhibitions: Environmental Devices at Kunsthalle Éphémère (Renens, 2018)

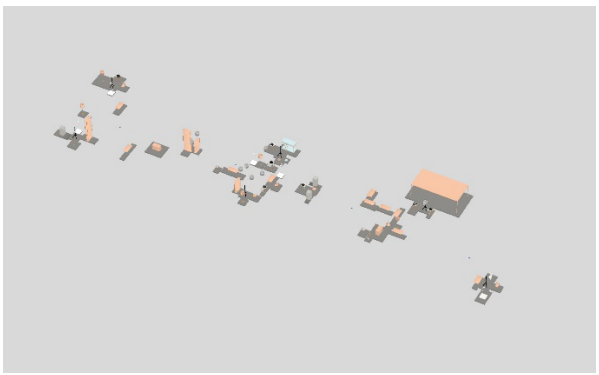
Location: Renens (CH)

- Use: custom architecture generator, spatial reconfigurations, and a "function collider" based on environmental data
- Algorithmic, rules-based software piece
- Live outputs: 3d constructs on two displays (large projection and screen)
- Inputs: dynamic and objective data from the environment (intertwined digital and physical: Wi-Fi signal strength, temperature, humidity, luminosity)
- Evolutionary constructions in correlation with live environmental data streams

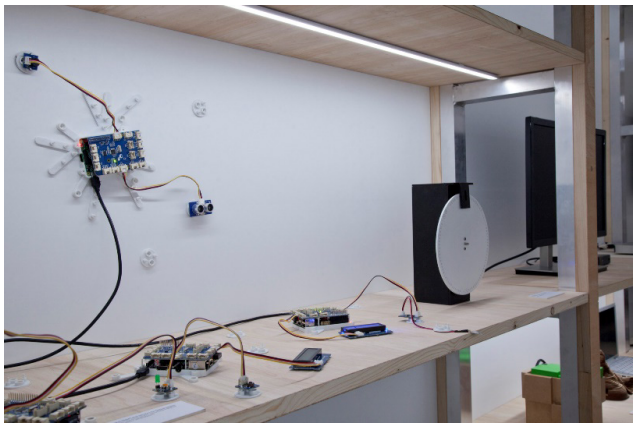




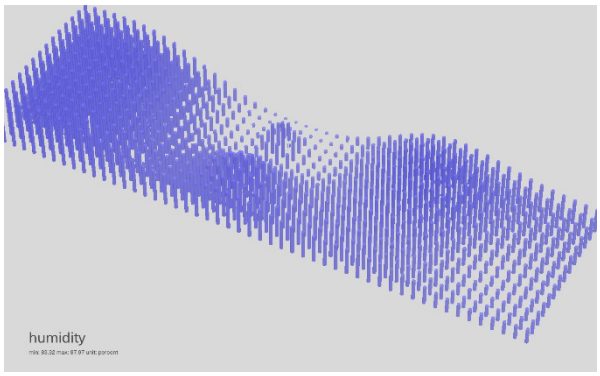


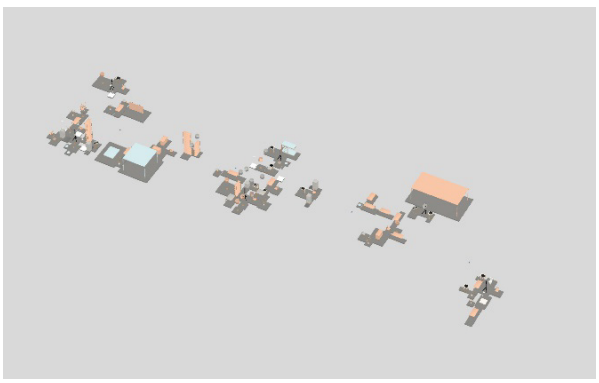


[Img. 1 - 4]

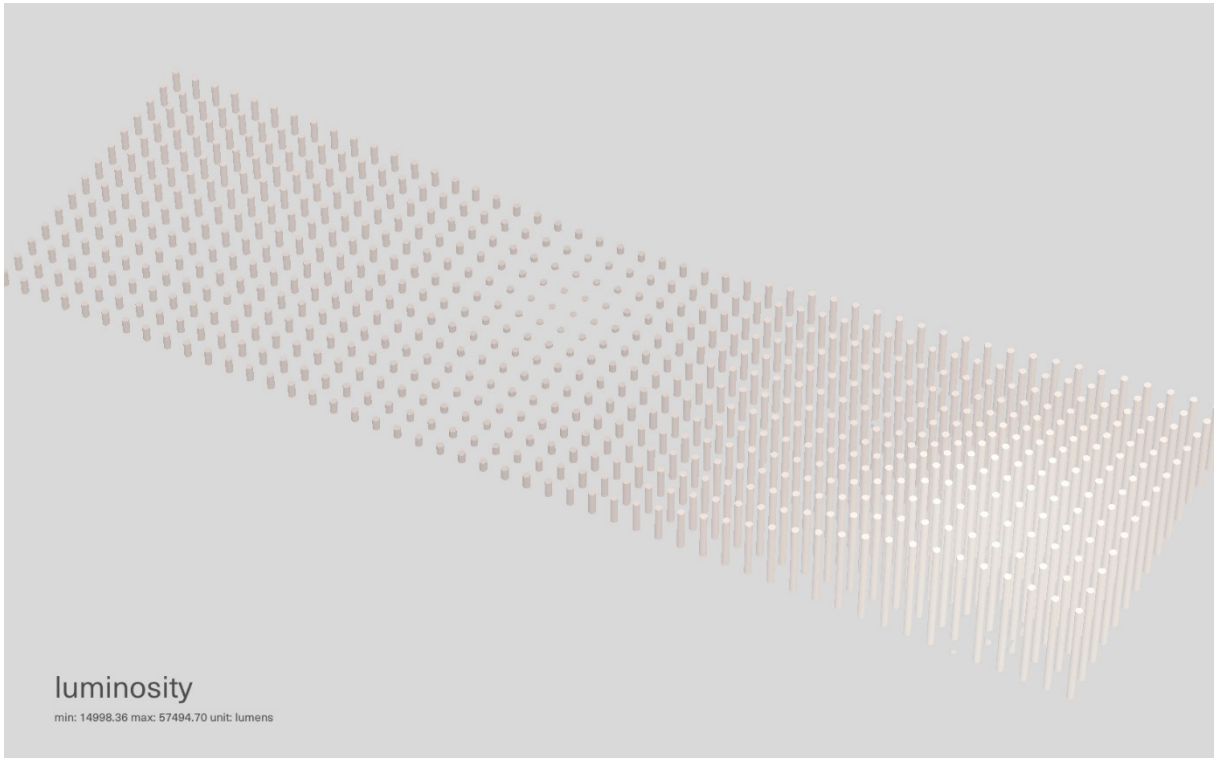


[Img. 5, 6]

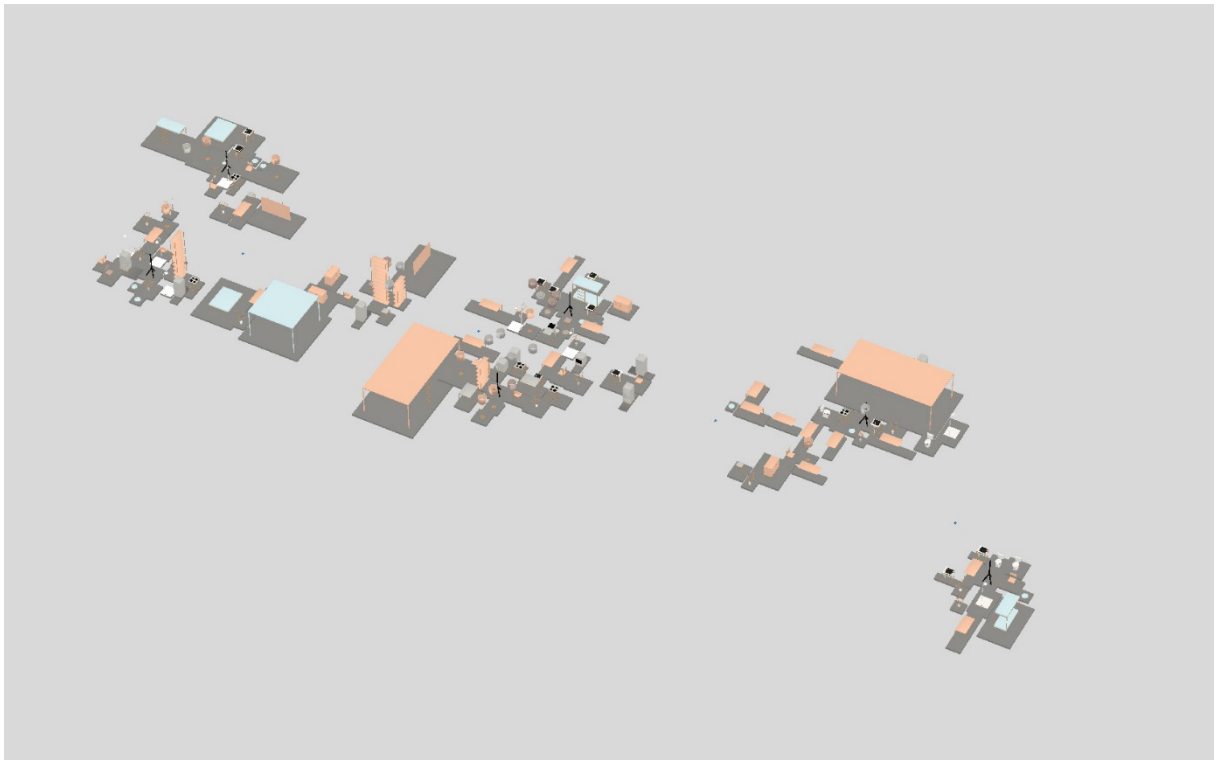




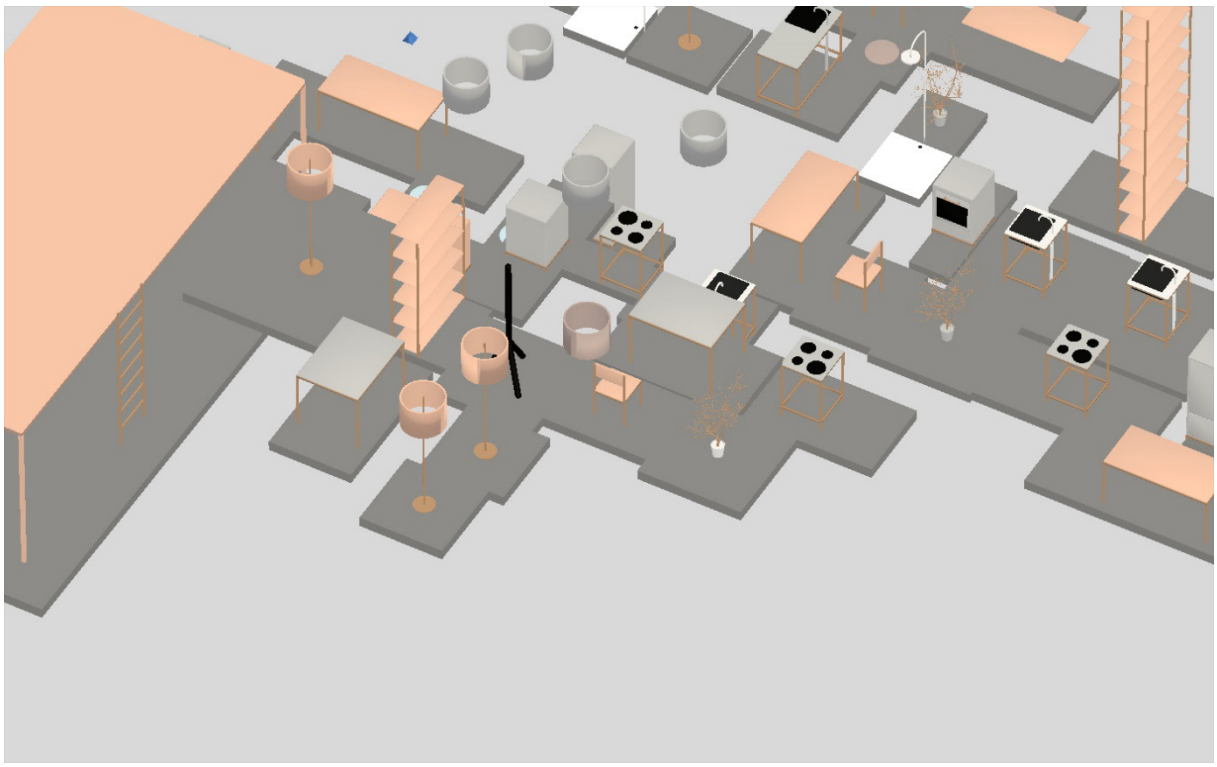
[Img. 7, 8]



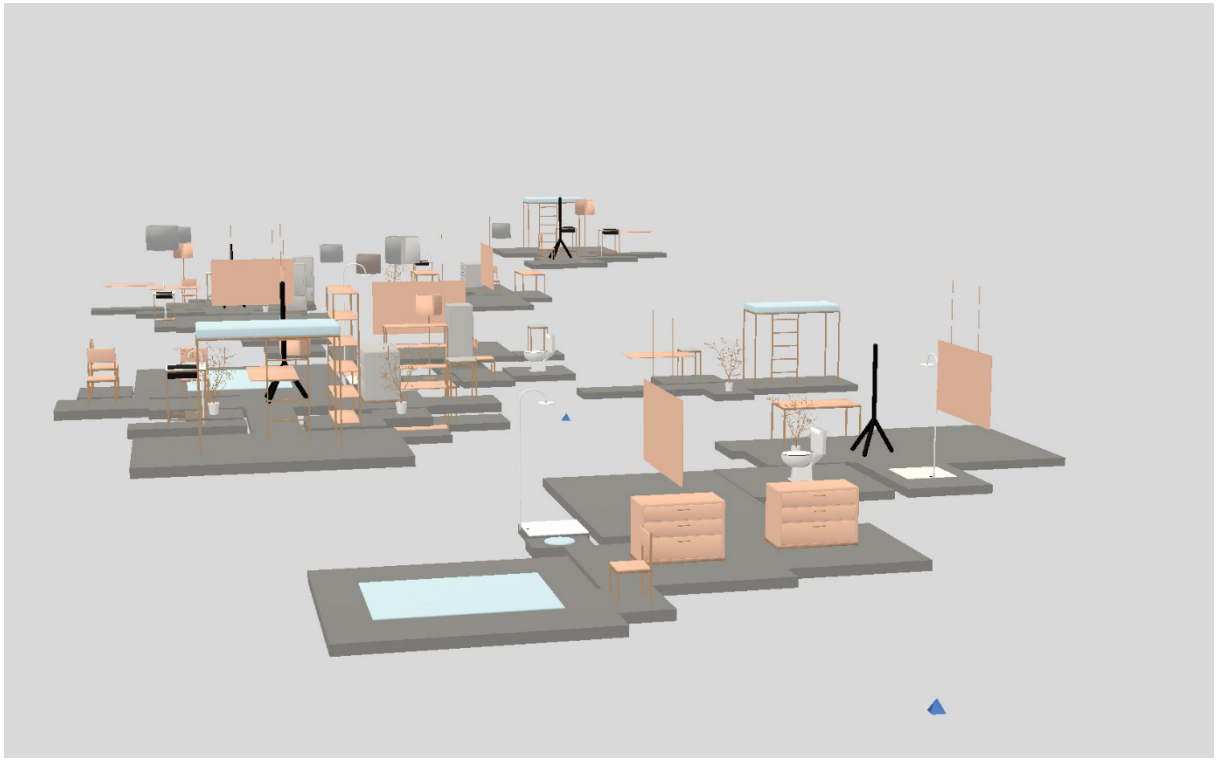
[Img. 9]



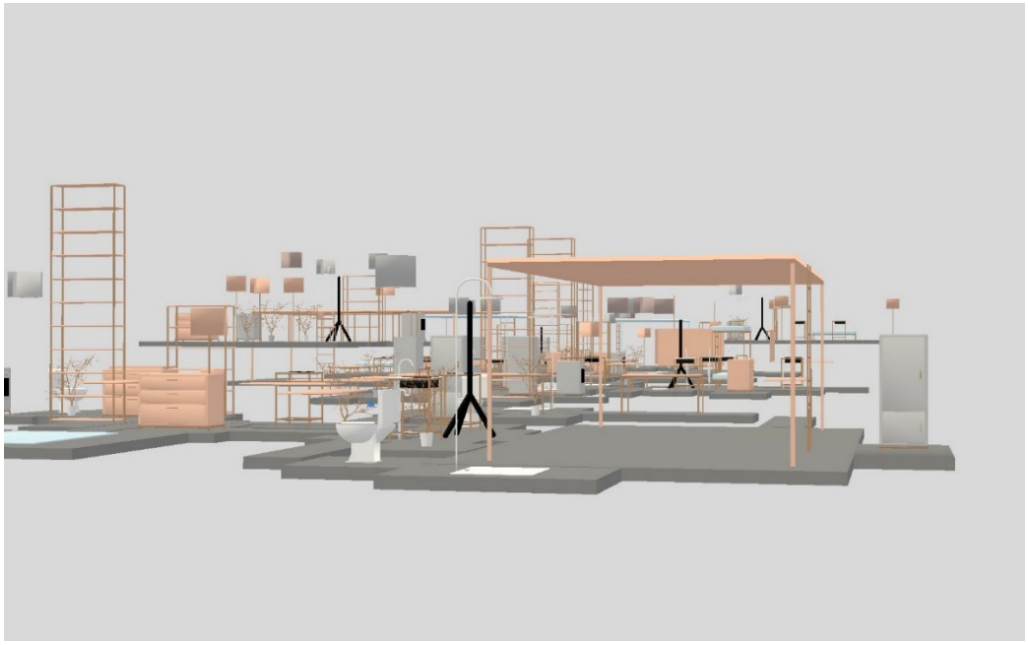
[Img. 10]



[Img. 11]

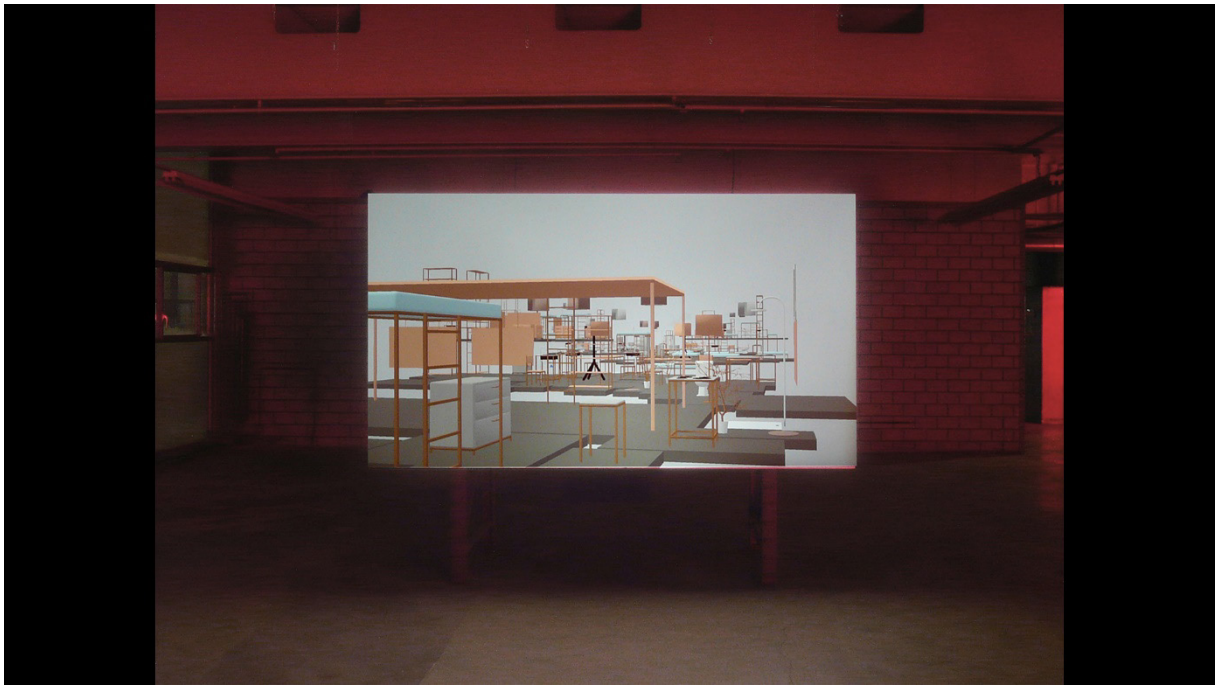


[Img. 12]

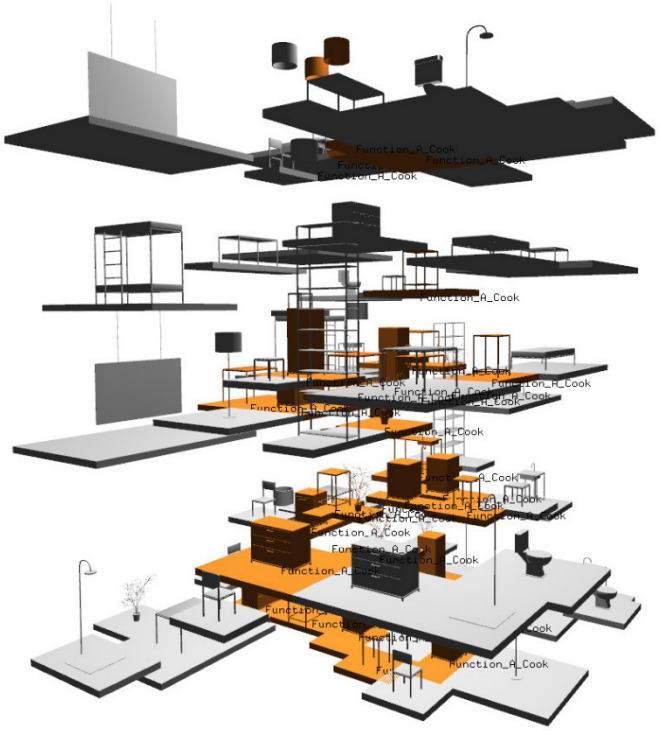


[Img. 13]

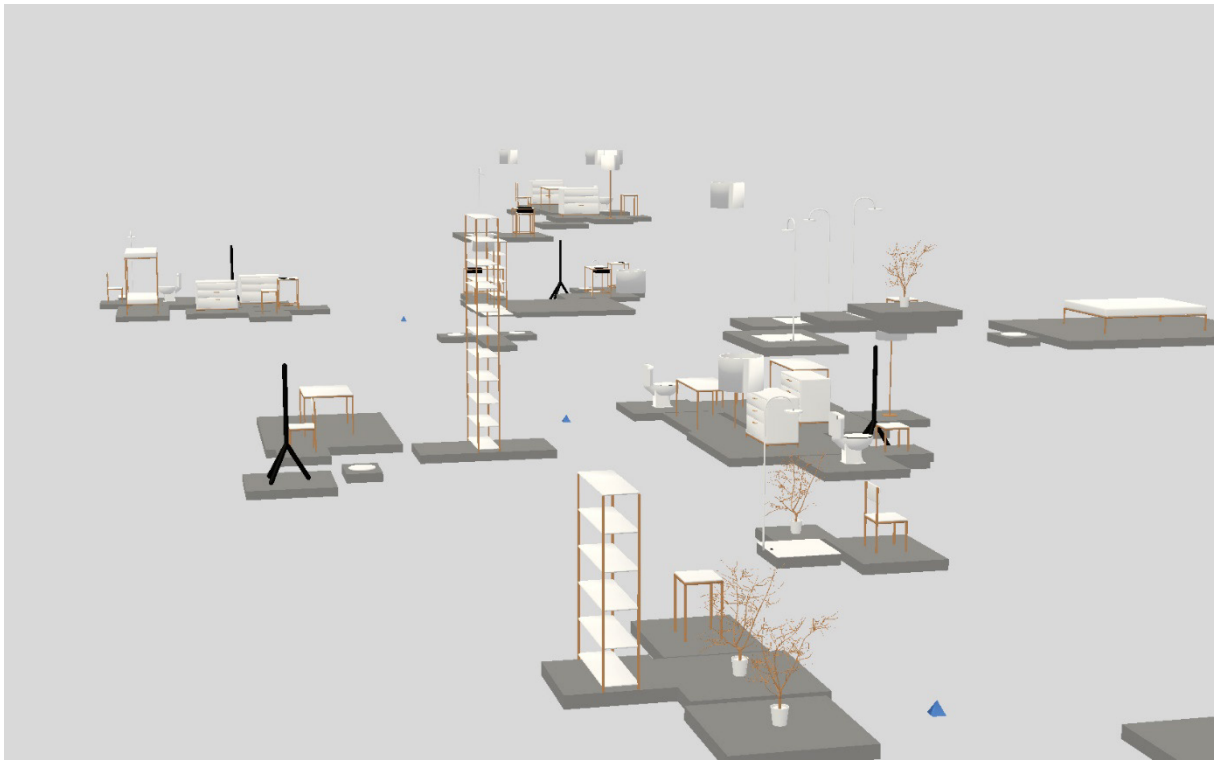
[Img. 14]



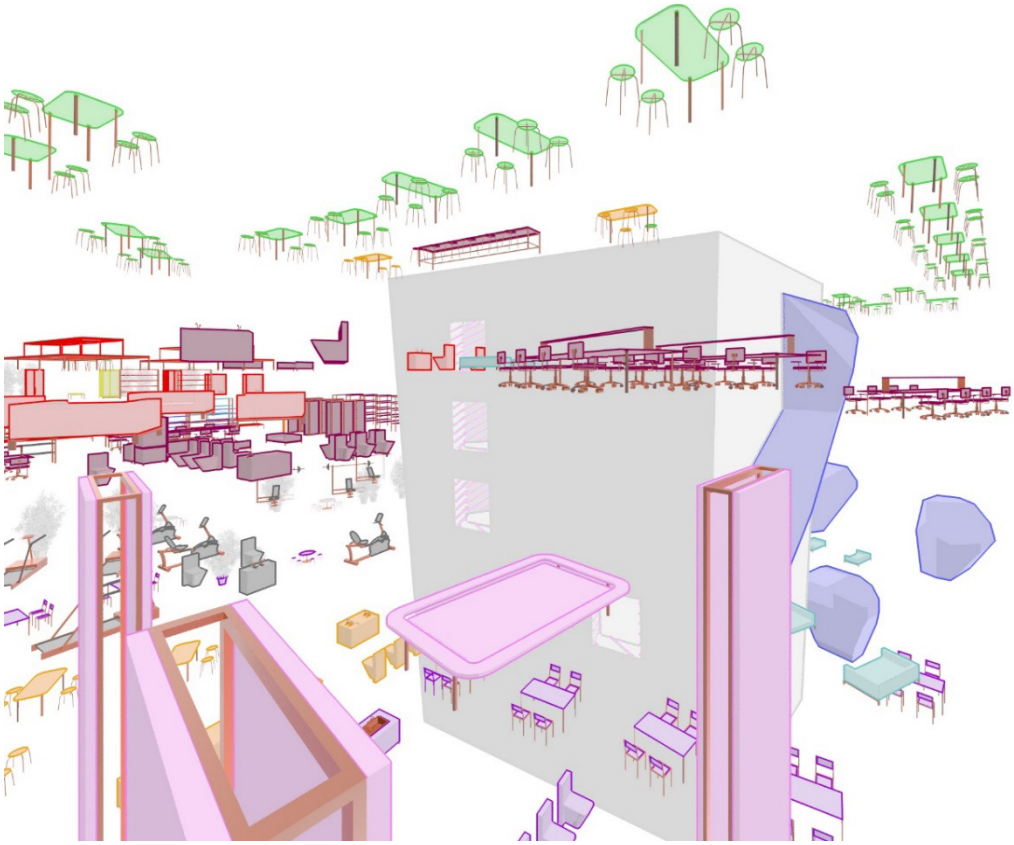
[Img. 15]



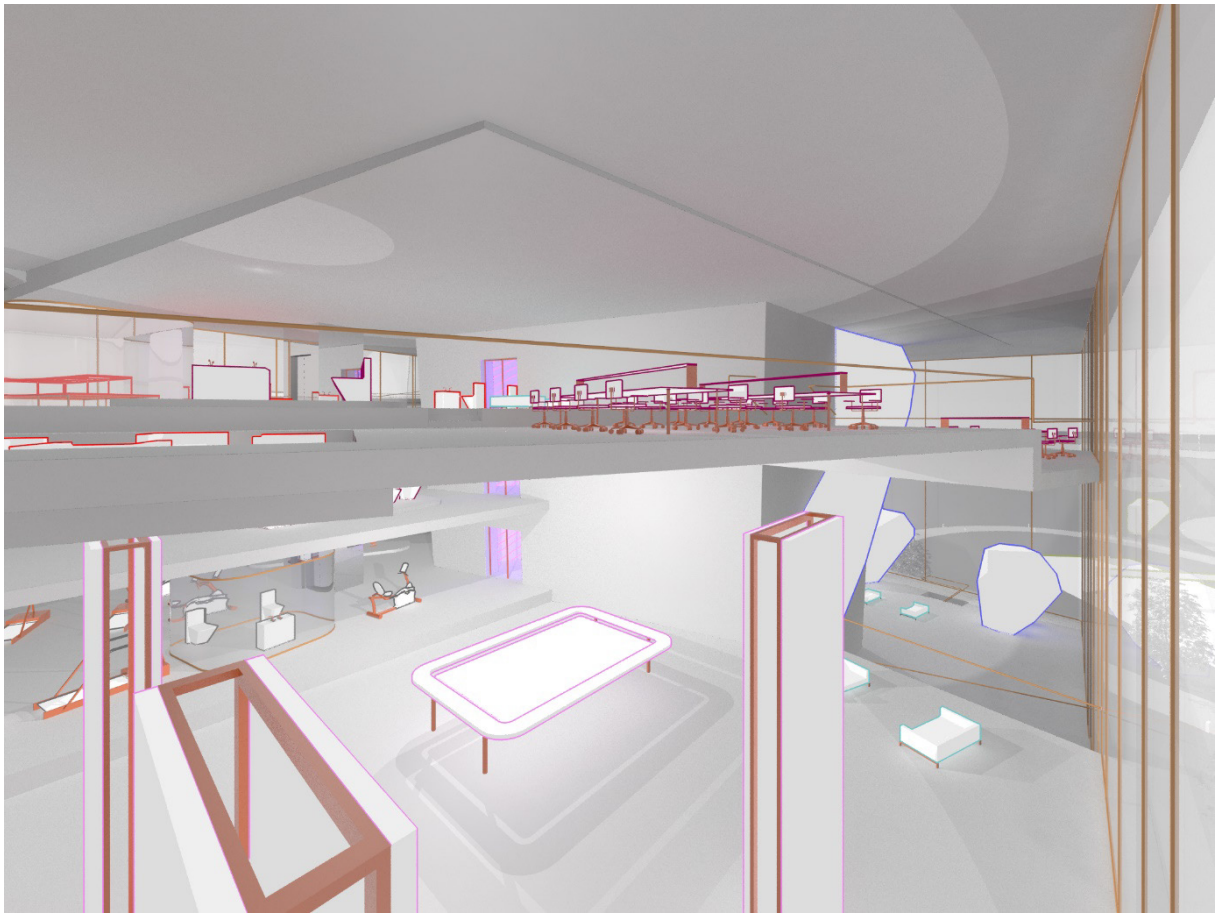
[Img. 16]



[Img. 17]



[Img. 18]



[Img. 19]

Image captions:

[Img. 1-4] Based on atmospheric data (heat maps of monitored wifi signal strength, temperature, humidity and luminosity), Atomized (algorithmic) Functioning starts to build spatial and functional configurations. Heat maps of dynamic atmospheric data are mapped on the volume to be tested.

[Img. 5-6] Sensors of different types monitor live environmental values at "Ephemeral Kunshalle" [Img. 5], 2018 and at HeK [Img. 6], in 2015.

[Img. 7-8] Humidity map. Assembly continues and is automated based on rules and relationships related to atmospheric conditions. It uses architectural functions and groups of functions (in this case domestic functions) that have previously been atomized into independent parts and are experimentally re-aggregated into different patterns.

[Img. 9-10] Luminosity map. The assembly and new aggregations continue...

[Img. 11-15] Various habitable configurations of domestic functions, in axonometric view, perspective and installation. No walls are used in this session.

[Img. 16] Same software piece in its original version. The functional program of a small house is being tested in a new volume and atmospheric configuration.
No walls are used in this session as well, the differences in ground levels allow to structure the continuous spaces and the original volume.

[Img. 17] New configuration. Archipelic construction.

[Img. 18-19] The whole could be compared to a simulated "large collider", from which it draws its inspiration, only for spaces and architectural functions. Hopefully it will develop new contemporary ways of inhabiting an intertwined environment that combines a set of physical and digital dimensions. As these parameters can be customized and tailored, the experimental potential of this project is significant.
In these images, the software used to generate an architectural configuration is related to a very specific program. Volumes come after the initial "collision" phase of the functions.

More about this latter project: http://www.fabric.ch/pdf/53_responsive_patios_m.pdf

Note:

Images [01 -17] present a sequence that runs in loop: the selected parameters of an existing environment that could be either physical or digital, or both combined, are getting continuously monitored and their values displayed in the form of evolving heat maps. In the case of this series of images, the monitored parameters were wifi signal (strength), temperature, humidity, luminosity, and noise.

The data produced are declared on a dedicated site (datadroppers.org).

These parameters serve a software piece [Atomized (algorithmic) Functioning] that continuously builds a 3d environment based on pre-existing modules and dynamic or static data. The assembly is based on custom rules.

The modules are "atomized" functional elements, up to a certain granularity that are somehow "collided" in the software to test new configurations and assemblages of functions for a dedicated space, in connection to environmental conditions.

Once the environment is built, based on the specific rules and constraints defined, the system starts again.

This is where learning can happen: each loop trains the system into understanding its environment.

If this AI layer is activated, the system progressively selects occurrences and repetitions, "friezes" them and continues to train the system based on these new initial conditions. The system potentially slowly converges toward a single configuration. The convergence can be of a differentiated nature (e.g. to a more, or less repetitive pattern).

Txt

Atomized (algorithmic) Functioning

Atomized (algorithmic) Functioning is part of an ongoing series of works: Atomized * Functioning, abbreviated as A(*)F. It is the second variation in this series and can be exhibited or deployed across multiple configurations.

A(*)F is an architectural project based on automated algorithmic principles, to which a custom machine learning layer can be appended as required. Operating as a software piece, it endlessly generates and records new spatial arrangements for a given situation. When its AI layer becomes activated, the system converges toward a "solution" in real-time 3D, responding dynamically to environmental data and constraints.

A(*)F is anchored in conceptual rules derived from the overarching research program of fabric | ch. Consequently, the primary significance of this work lies not in the "AI" or machine cognition itself, but rather in the automated design process governed by author-defined rules, and the broader inquiries it provokes.

Grounded in this research program, these rules continuously seek new functional associations tied to the hybrid physical-digital state of our contemporary landscape—theorized by some as "post-digital", "anthropocenic", or "capitalocenic". To achieve this, the algorithms utilize "atoms" (3D architectural components organized in a predefined, atomized granularity) to execute their combinatory constructions. The system parses and maneuvers through these elements to discover unexpected, sustainable reconfigurations ("creolizations") driven by live data streams: automated, creolized architectures.

The ongoing computational work performed by the AI is displayed continuously across variable screen layouts and dimensions. Depending on the installation requirements, these displays function as immersive, analytical, or illustrative media, and can even incorporate robotic control.

As stated, the automated calculations of the AI are not the central focus. Instead, the core stakes and questions revolve around A(*)F's capacity to generate endless spatial proposals and configurations for specific existing conditions—whether dynamic (sensor data) or static (structural constraints)—and to archive them for subsequent analysis by humans or algorithmic systems.

A(*)F was exhibited and performed for the first time during Environmental Devices *(1997–2017)*, a monographic exhibition held by fabric | ch in 2018 at the Kunsthalle Éphémère, in Renens (CH).

fabric | ch, April 2018

Contact

fabric | ch (97-26)

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