Atomized (algorithmic) Functioning

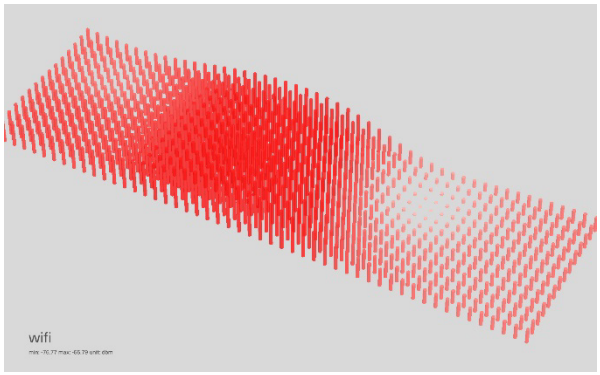
2018

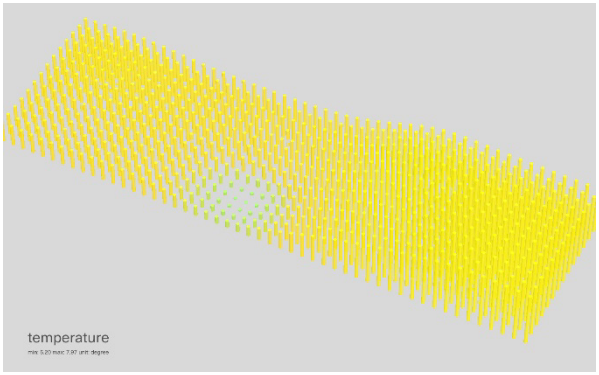
Architectural software & project by fabric | ch

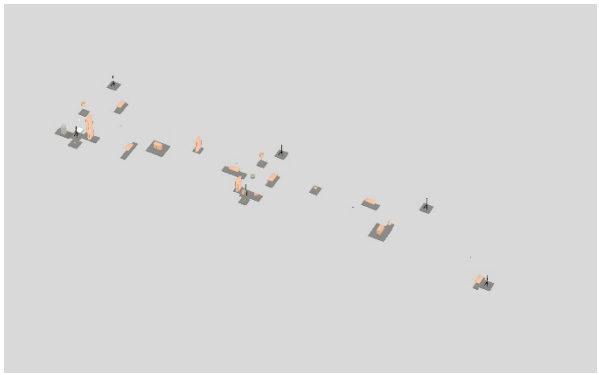
Internal research. Developed, used, customized, and presented through exhibitions: Environmental Devices at Kunsthalle Éphémère (Renens, 2018)

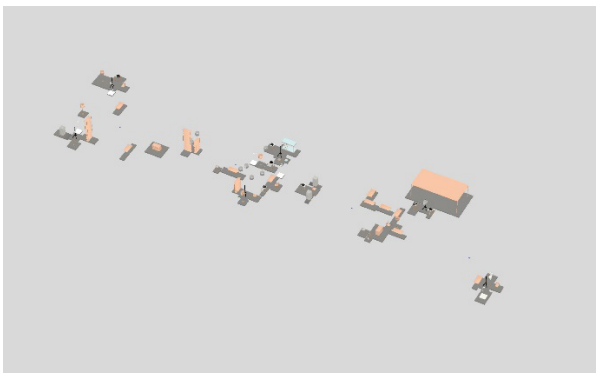
Location: Renens (CH)

- Use: automated architecture, spatial reconfigurations, "function collider"
- Algorithmic, rule-based software piece
- Live outputs in the form of 3d constructs on two displays (large projection and screen)
- Inputs of dynamic and objective data from the environment (intertwined digital and physical: wifi signal strength, temperature, humidity, luminosity)
- Evolutionary constructions, in correlation with evolutionary live environmental data

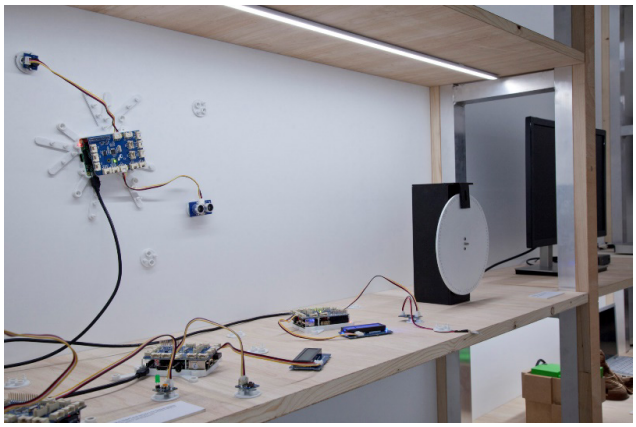




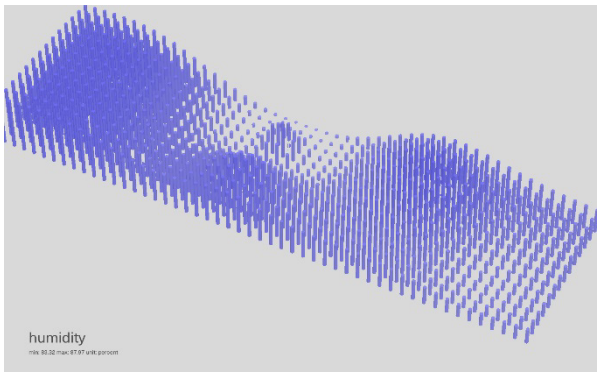


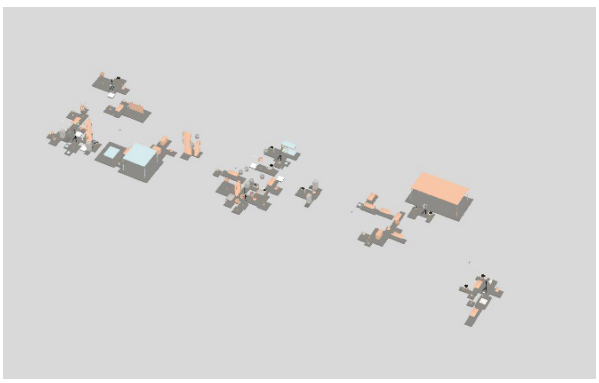


[Img. 1 - 4]

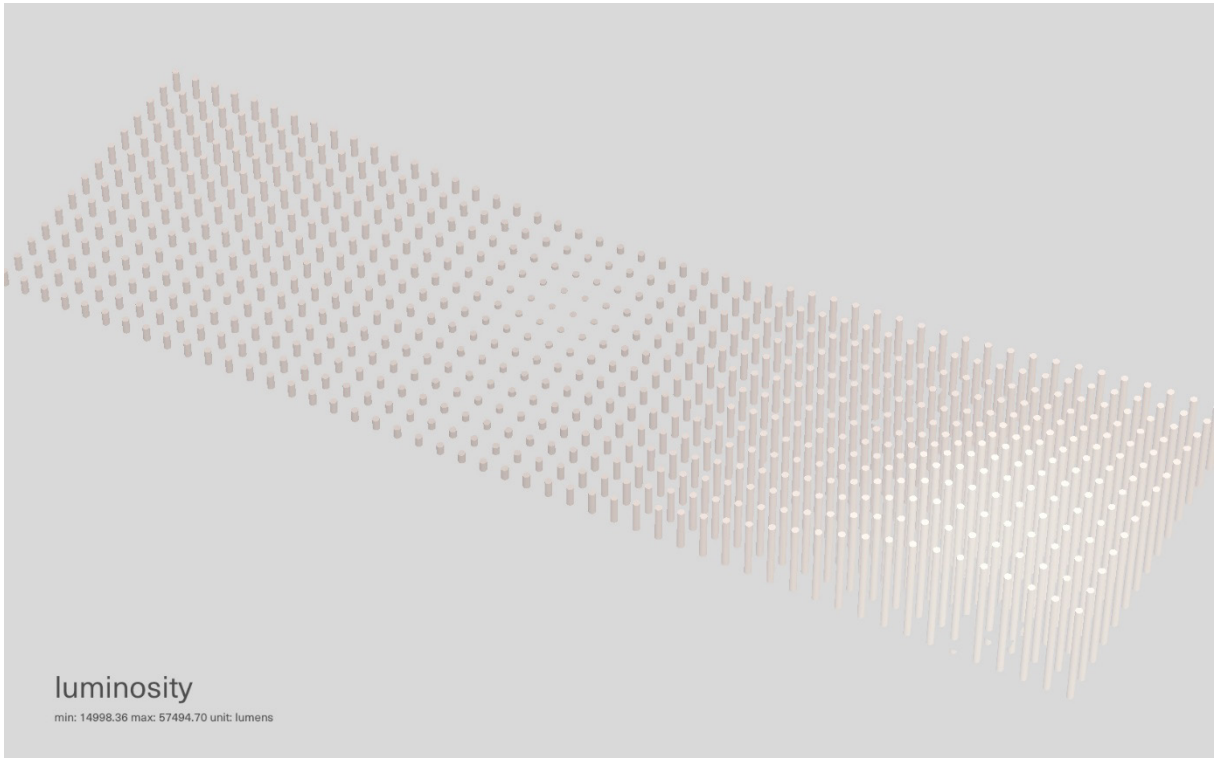


[Img. 5, 6]

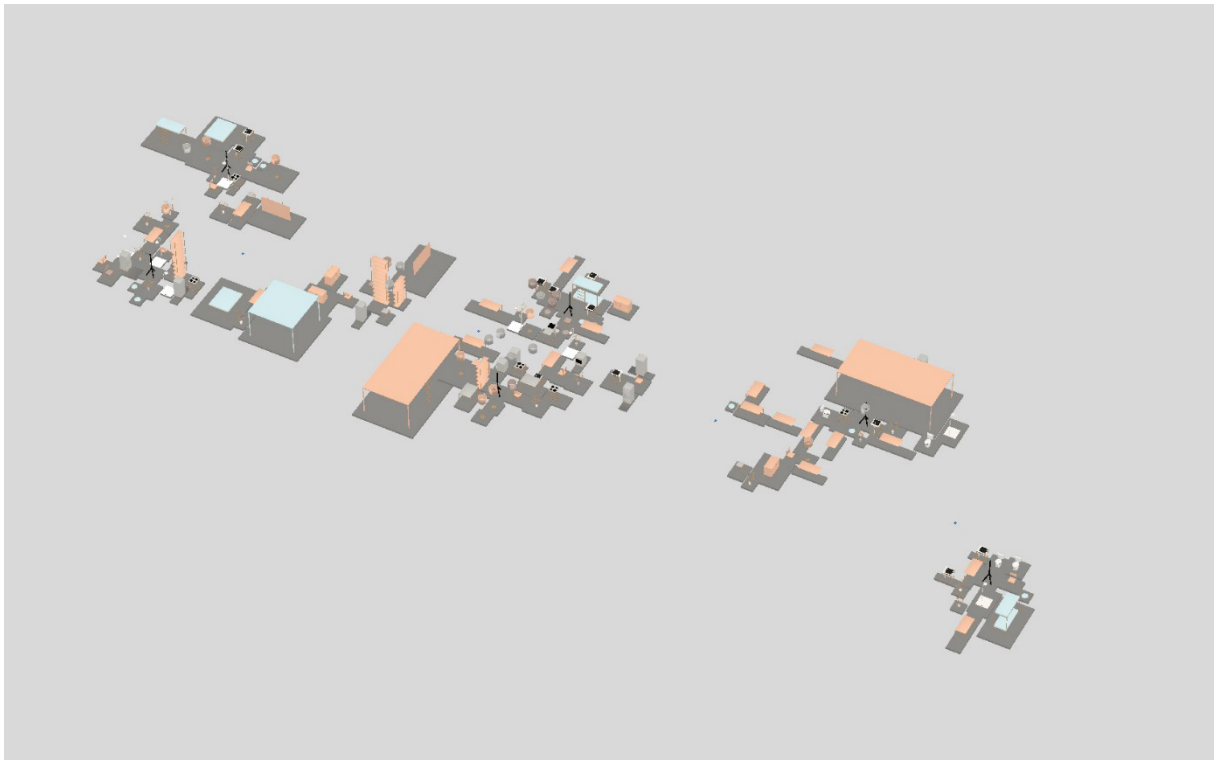




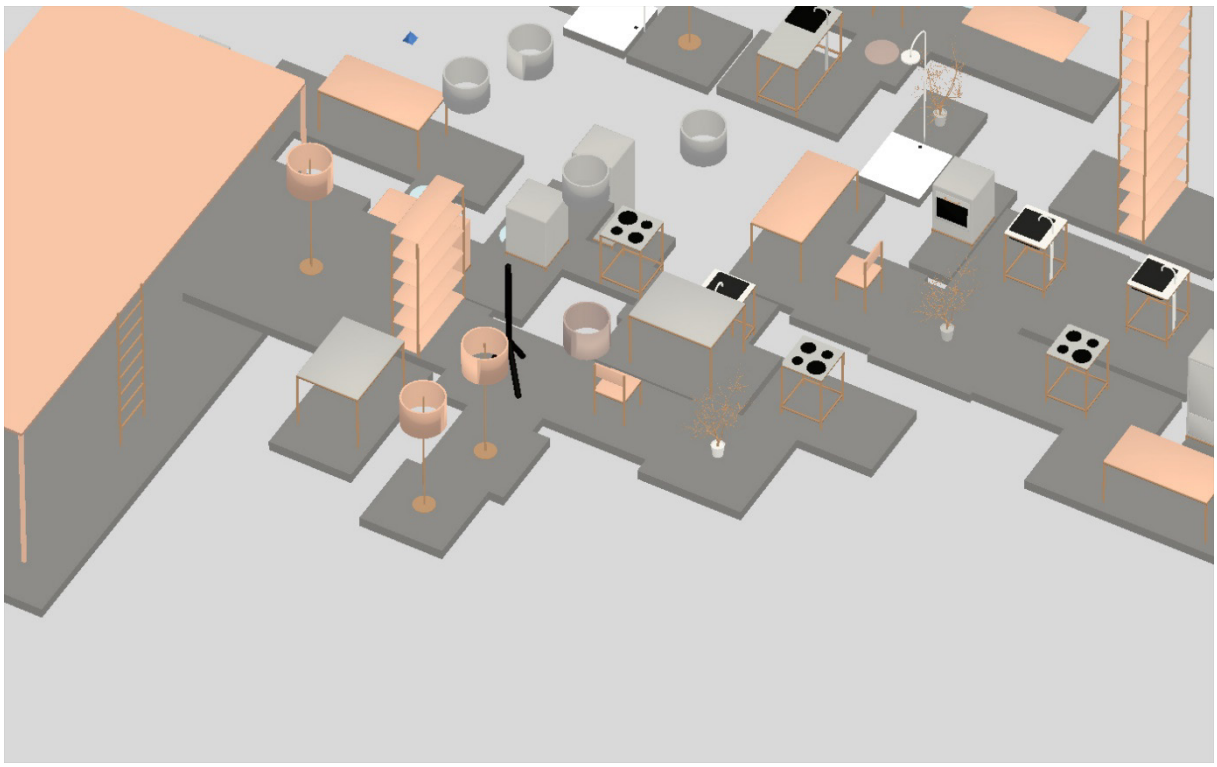
[Img. 7, 8]



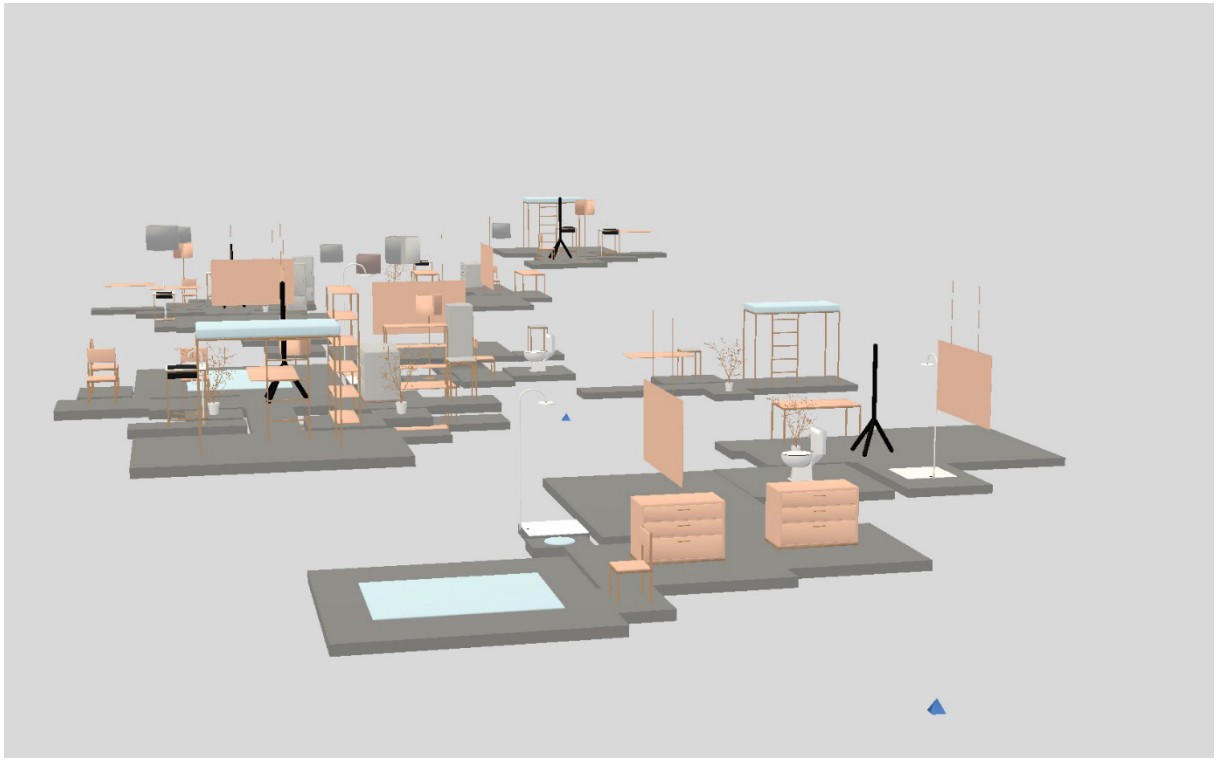
[Img. 9]



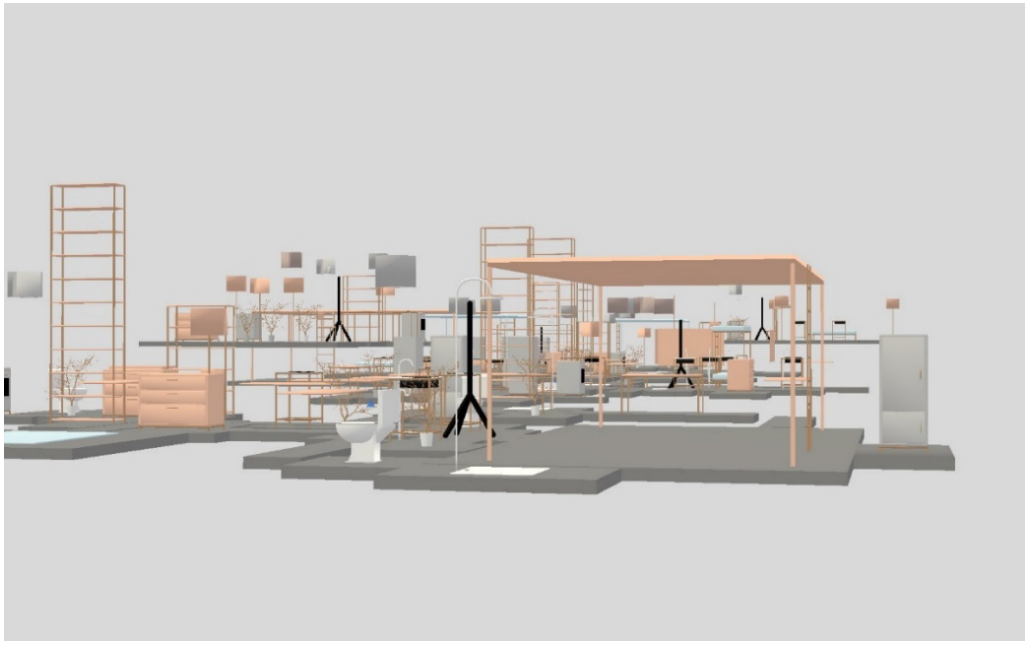
[Img. 10]



[Img. 11]

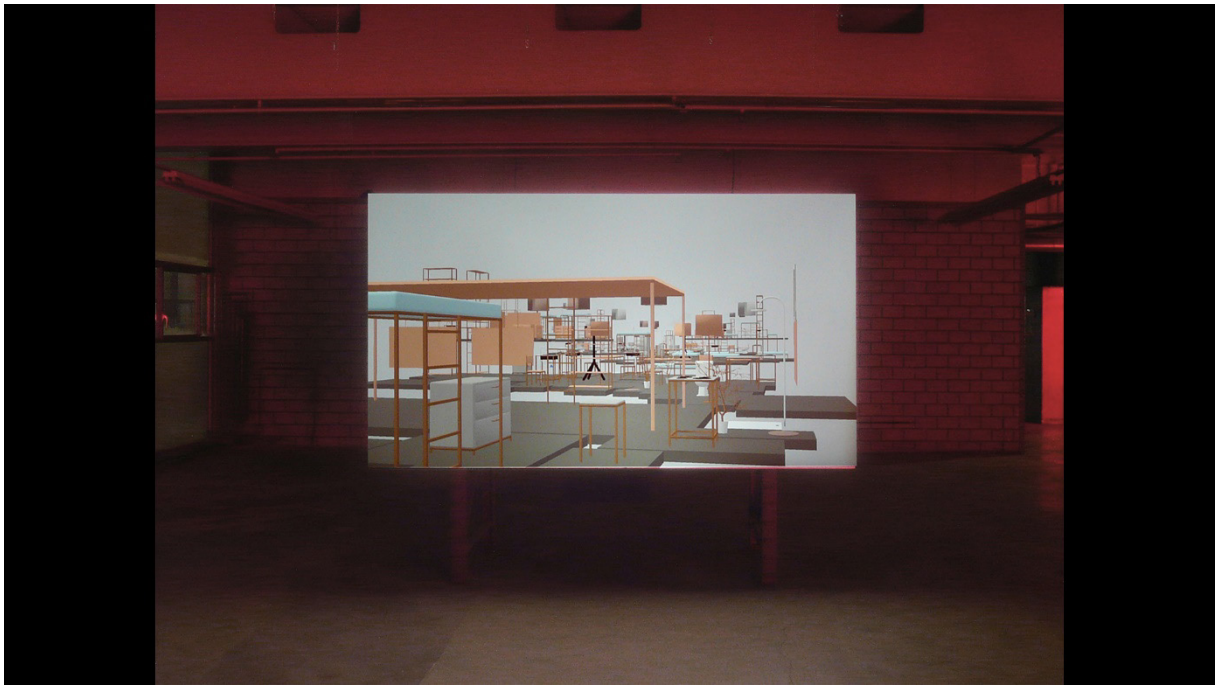


[Img. 12]

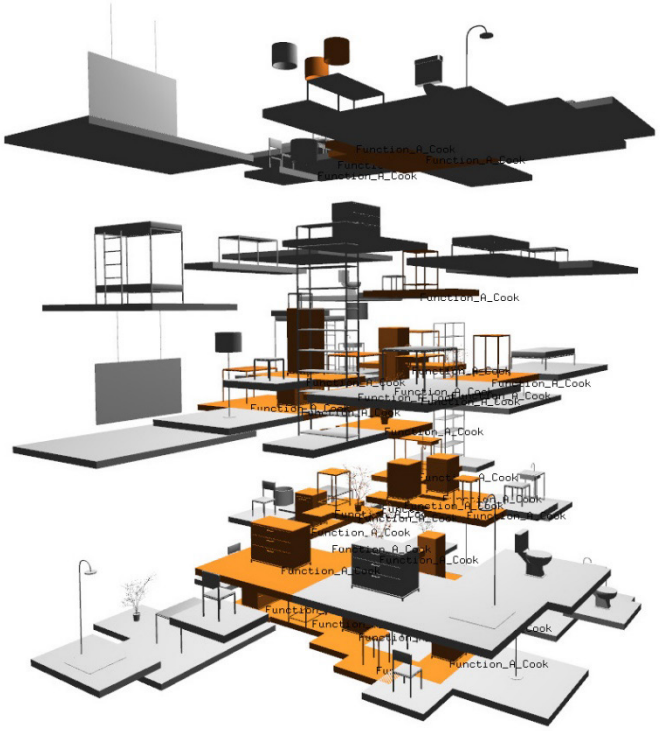


[Img. 13]

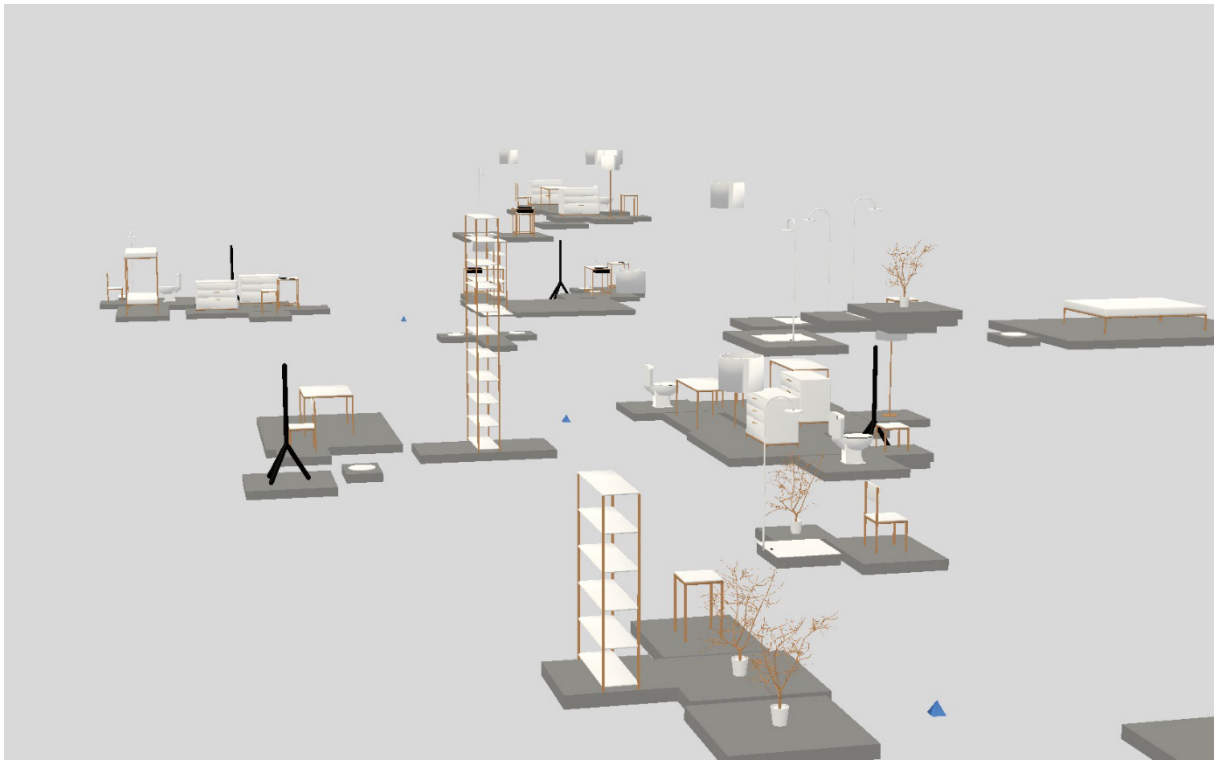
[Img. 14]



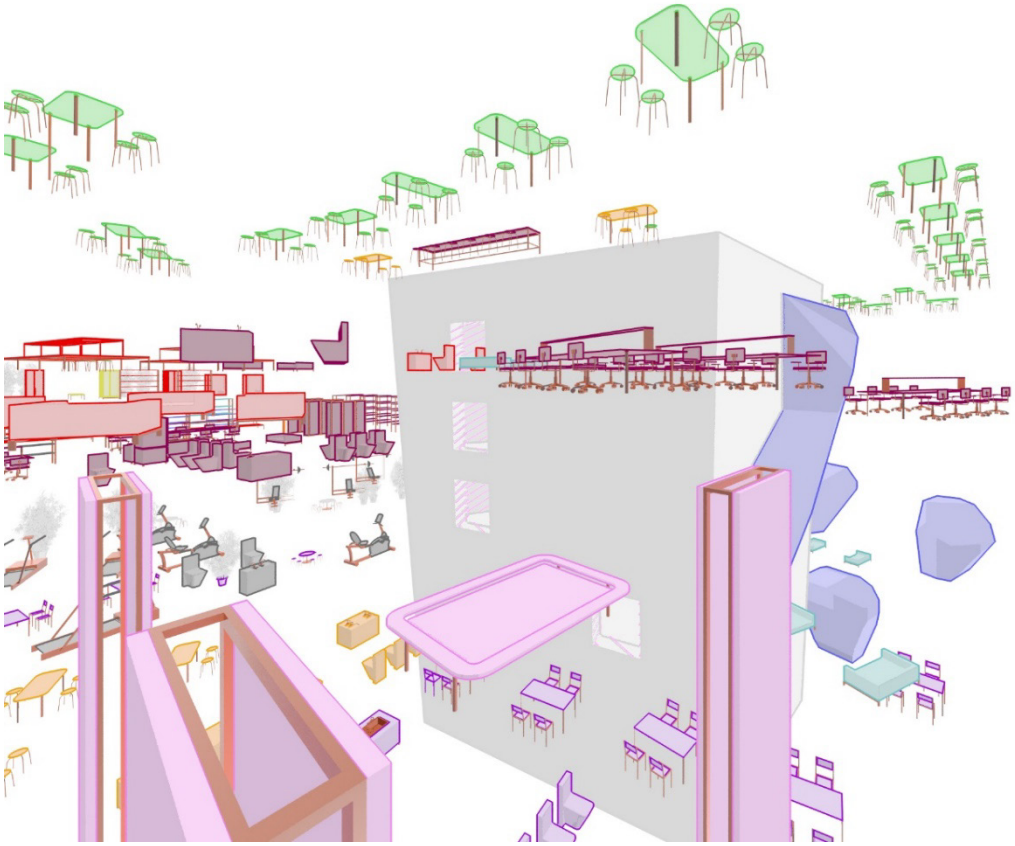
[Img. 15]



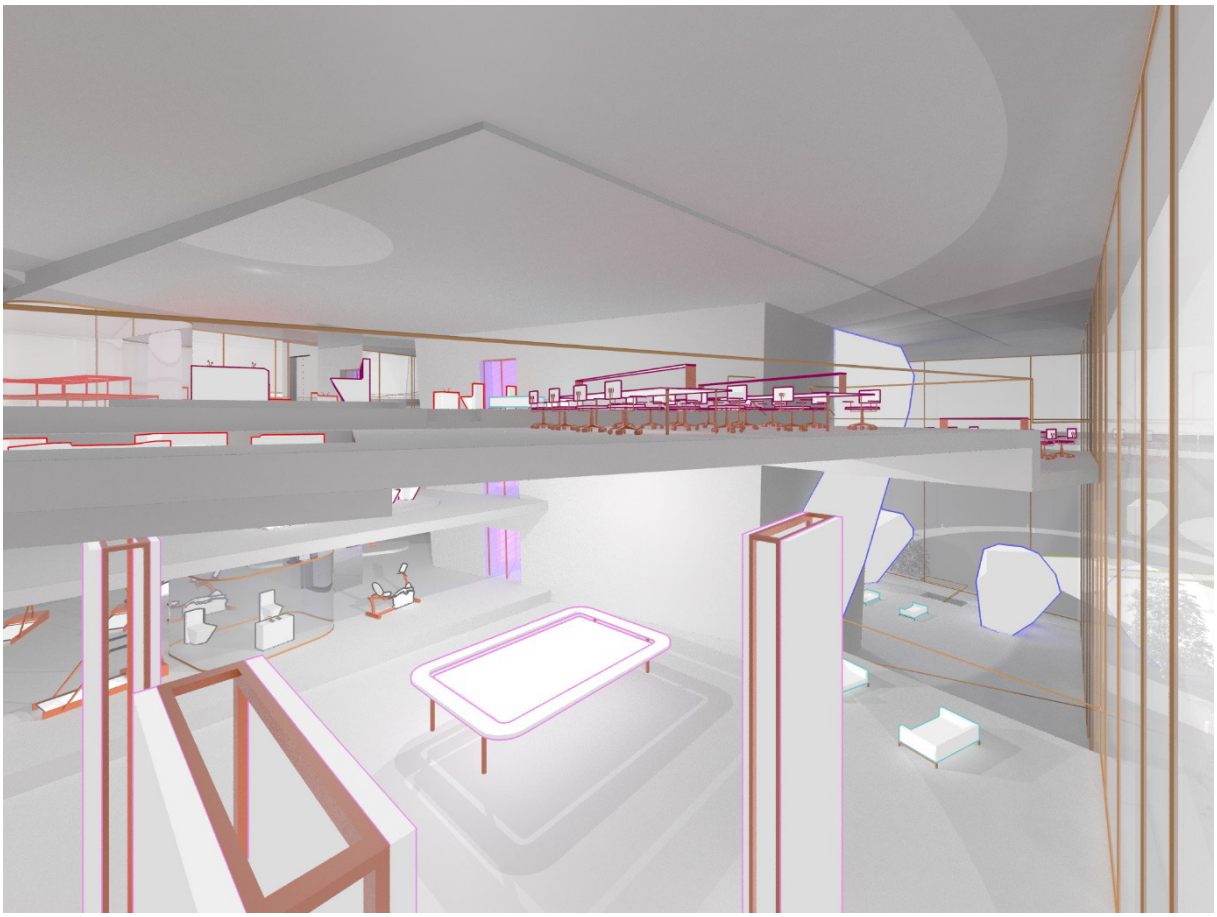
[Img. 16]



[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).

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Atomized (algorithmic) Functioning

Atomized (algorithmic) Functioning is part of an ongoing series of works: Atomized (*) Functioning, shortened A(*)F. It is the second variation in this series. It can be exhibited and used in different configurations.

A(*)F is an architectural project based on automated algorithmic principles, to which a machine learning layer can be added as required. It is a software piece that endlessly creates and saves new spatial configurations for a given situation, converges towards a "solution" when its AI layer is activated, in real-time 3d and according to dynamic data and constraints.

A(*)F is based on conceptual rules related to the general work and research program of fabric | ch. It is therefore not the "AI" that is important in this work, but rather the automated process of design based on rules defined by the author and the questions it raises.

Based on this program, these rules constantly seek new functional associations related to the physical-digital state of our contemporary environment ("post-digital", "anthropocenic" or "capitalocenic" some have theorized). To do this, they use "atoms" (or 3d architectural elements in a predefined and atomized granularity) that have been made available to the algorithms to carry out their combinatory constructions. The system digs and searches for unexpected and sustainable reconfigurations ("creolizations") of these elements according to live data: automated creolized architectures.

The work in progress performed by the AI is continuously displayed on screens of different sizes and quantities, accordingly. The displays can therefore be immersive, analytical or illustrative as required, they could even be robotic and controlled to some extent.

As mentioned, the automated work performed by the AI is not in itself important. The stakes and questions consist in A(*)F's ability to produce endless spatial proposals and configurations for a certain type of existing conditions - whether dynamic in the form of sensor data and/or static in the form of constraints - and to store them for further analysis by people or algorithms, if desired.

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

fabric | ch, April 2018

Contact

fabric | ch (97-23)

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