Orambra

Chuck Hoberman

Theo Jansen

HybGRID

BMW GINA Concept Car

WhoWhatWhenAir

Responsive architecture:
Learning from the Human body structure

During the 60's a notion for optimizing architecture performance started to develop. Discussing how could that be achieved, Nicholas Negroponte stated that studying the construction of the **human body** and how it operates could lead to certain solutions.

A valid example is the work of WhoWhatWhenAir team, for the MIT mini skyscraper competition. A mechanical construction system of **bones, muscles, tendons and a brain** that knows how to respond, according to certain input. It was realized as a **spinal** structure where a pneumatic system could manipulate the actual movement.

A similar approach is that of Orambra, where the movement is still controlled by a pneumatic system, but the construction of **muscle and bones** is achieved by a tensegrity construction.In both these cases the actual brain is a computer manages a system of sensors.

Another example that operates in a different way, is the moving sculptures of Theo Jansen, where the movement is beign powered by the wind, causing the "animal" structure and its artificial "**legs**" to move. The direction can be controlled, but in this case the **brain** is a mechanical construction that operates on a binary system, a series of 1and 0, yes and no. The "animal" can count its steps, and is able to decide which direction to go, but limited to the choices of left and right. More advanced versions can perform other tasks like bracing against strong wind,or storing kinetic power in order to use it when no wind propulsion is available.

The intention of this research is to see the **human body** construction not simply as a construction, but as a collection of systems that are designed for a specific purpose, yet can still operate as a whole. Based on this concept, the outcome would be a proposed system of architectural elements that can act responsively to certain conditions and situations independently, but also as one construction assembly. The tools to achieve this are yet to be explored, given the fact that the possibilities in responsive architecture are to this day not clearly defined.

References

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