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MSc3/4 Hyperbody

Media Studies Report

Project Introduction

In collaboration with the Game Set Match 3, this project will fall under the category of Robotic Building Technologies. This MSc3 project proposal is the design of a Multi Function Startup and Tech Exhibition Center. The startup scene in Amsterdam (locally) and The Netherlands (nationally) is very strong and has been successful over the past few years. The strategic location allows for new startups to flourish, as well as support from the Dutch government has allowed startups to be more successful. Since more startups are likely to occur, they will need spaces to house their new startup companies.

There are multiple exhibition centers around Amsterdam, but they are relatively small and spread out from the city center. The main one is the RAI which is approximately 25 minutes (7km) from Amsterdam Centraal by either Public transport or direct driving. This is not exactly the best location to experience the city while at a conference.

Amsterdam is a leading city for startups in Europe and worldwide. It has been named Europe's West Coast Startup Capital and there are even some who say it is a good alternative to Silicon Valley. The reasons are numerous, of which a main driving factor is the government has multiple resources to help in the success of startups.

This presents the unique opportunity to propose an exhibition center specific to the tech industry that would incorporate temporary/ semi permanent exhibition spaces and facilities to house startups in the Marineterrein in Amsterdam. This could be a place for collaboration between mainstream tech companies, such as Microsoft, Apple, Google, Samsung, etc to house semi permanent exhibition spaces in one place. The startups could then collaborate with the companies and work together to enhance the tech industry.

Computational Design Strategy

This project will house the next generation of technology and startups. The design will reflect what is held on the inside through a computational design strategy progressing nonstandard architecture. The site will first be analyzed in terms of people flow, (where people come from, where they are most likely to go, where they are most likely to stay, etc) solar, wind and climate analysis, along with the local, visual and physical connections. These inputs will be used to define the boundary of the building within the site. They will also be used to define certain parameters of the building itself, such as heights, views, certain directions of structure, etc. Once the boundary is created, the program is determined and placed on the site. The overall design and form will be derived from spatial analysis of the required program. This will start with the analysis of what

functions are required in a multi use tech exhibition and startup center. Once the programs and functions are taken into account, the analysis of the spaces, functions and uses will be cross referenced and tagged in order to determine which spaces need to be close to each other and which ones can be farther away. This will be accomplished through a script that places the individual programmatic spaces within the boundary in close proximity to other spaces that are required to be close. Once these spaces are defined and the areas are set, swarm logic, people flow simulation and environmental factors will shape the form and connect the spaces. The swarm logic will start from specific areas on the site where people can enter and connect the ground to the building and interior spaces. The autonomous agents will create a trail that will define other architectural elements critical to the design of the center. These would include public/ semi public spaces that lead the visitor into the building. People flow analysis will be used to create the internal flows of people in the tech and exhibition center as well as the external to internal flows and vice versa. The wind analysis will help to streamline the form so that the wind will not create extra stresses across the building, rather flow along the structure. The environment, climate and other factors will be taken in to account in order to create a low impact building that concentrates on performance driven aspects, revolving around and showcasing the tech industry.

Prototype and Micro/Meso Scale

In the micro/meso scale, the buildings skin and construction components will be explored to derive a new way to use Carbon Fiber (or composites) in the construction field. This part will fall under the category of Design to Robotic Production. The goal for this portion is to explore and create a self supported or minimally supported carbon fiber structure (or composite structure) that would integrate the systems, structure and aesthetics into the building pieces. Through the use of programming and biomimicry, the composites would be designed in a way that is structurally sound, aesthetically pleasing and performance oriented. The design of the building will incorporate Robotic Building technologies, as the whole building would be designed and built through the use of robotic manufacturing practices.

Spatial uses will be defined and the best material for the purpose will be used. This project may utilize standard materials, such as concrete or steel for specific purposes, but the driving factor is the use of carbon fiber, which is a performance oriented material. This will be exhibited in the tech, which is a performance oriented industry. Different methods and types of composite application will be explored for the spatial purposes. One would be sheets of composites, which would be used for areas that require climate control or enclosed spaces. The other would be woven carbon fiber. This method would be used in areas that do not require absolute enclosure. A third could be a hybrid of the two. This hybrid would be used in transitional spaces, such as the entrance to the building, where the thin and elegant strands of Carbon fiber meet the covered sheet or plates of the climate controlled areas.

Inspiration will be drawn from firms including Kokkugia, Studio Robert Stuart-Smith, Tom Wiscombe, Gilles Retsin, and other agent based computationally designed architecture firms. The RMIT Highway by Kokkugia will be inspiration for the carbon fiber strands in the open spaces and the potential bridge to cross the canal. These strands produce unique aesthetics that are directly correlated to the high performance quality of carbon fiber. They also create a porosity that is

directly linked to the amount of structure necessary. The second precedent is the Busan Opera House by Kokkugia. The skin creates the allure and allusion that the building is physically moving. The porosity from the material brings light into the spaces as well as creates a mirage of the interior spaces. This same affect repeats itself on the outside, turning the conditions viewed through the skin into a watercolor painting. These ideas and sensibilities will be replicated via the computational design strategy.

Conclusion

The objective from the research and design (aside from the design of a Tech Conference/Exhibition and Startup Center) is to create a 1:1 prototype piece that fully functions and is performance oriented by minimizing the amount of carbon fiber and maximizing strength. Systems will be integrated in the design piece in order to replicate the real life situation of a building that fully integrates the systems, structures and aesthetics. The full building will be designed, and then a chunk prototype piece will be selected and built.