EXPERIMENTAL MODELLING FOR ALLOCATING MATERIAL RECOVERY FACILITIES IN THE METROPOLIS

Integrated research between Circular Economy and Urban Spatial Structure

P5 Reflection by Weizhen Luo

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At the early stage of my graduation year, I had vague idea about which direction this project will be heading to. Because the motivation of this project is a phenomenon, I thought the most efficient way to design a solution is to easily the existing problems. After several group meeting and discussion with my mentors, I shifted my focus to the underlying reason instead of the symptoms of the problems. During this time, I began to read several classical theories about urban planning and design. Those reading cleared my mind and gave me more interests in finding the logic behind a complicated phenomenon. I think in the interaction between research and design is quite simple and straight. There are several articles talking about how to use research as a tool to design and how to use design for research. In my opinion, as a student from urbanism track, research and design are closely intertwined. There is no sharp boundary. I proper to consider these two terms as the major sections in my workflow. They complement each other and inspire each other repeatedly.

My graduation group is Urban Metabolism and my graduation topic is about experimental modeling the CE-related facilities based on different urban spatial structures. I think my topic is with the research scope of our graduation group. However, the angle or position of my project is quite different. Basically, the study of UM is mainly about describing and analyzing the material flow in different regions. It was based on existent research, and precise work.

When I got the result from the abstract model, I feel quite confident because most of the results could refer back to previous theories. Besides, I think the value of my graduation project can provide a tool for decision-making based on the empirical data. The enormous part of work in this project is calculating the cost for Material Recovery Facilities. All the calculation was based on existent research, survey and analysis. I do believe the result of my research could lead to further study and provide some fresh inspiration to others.

The main ethical issue in this project is at the final stage, which is the optimisation model. I have calculated the monetary cost, ecological cost and revenue from selling recovered materials. However, how to find the balance between them is a tricky question. There is always one or several parties have to compromise. I do believe the results could make some contribution in practice. For example, it can be used as guidelines for allocating the CE-related facilities and it can provide suggestions to decision-makers.

However, there are huge limitation of this project. Problem one is that I am afraid I over-simplified the problem. For Geo-design, the reality of the chosen site is too complex and also lacking large amount of data, this situation made it quite difficult to proceed. By contrast, cellular automation is too abstract and to understand this method requires advanced knowledge about math and computer science. That made it not realistic for me to develop a parametric model. Regarding this, there are several different methods. The whole process was conducted in the Rhino environment which is a versatile software widely used by designers. It also provide the Grasshopper plugin that could be used as graphic coding tools. Although, I knew most of the functions in Rhino and Grasshopper, the way of doing parametric modelling was still a stranger for me. In the middle of this whole year, I spend quite long time in reading literatures and finally found an innovative method called ‘generative multi-performance design system’. This method widened my eyes and inspired me to think the relationship between this method and Geo-design. I found out they actually share the same structure and workflow. From description model to evaluation model and change model. Their core principle is the same: the only different is their working environment. The value of parametric modelling is to give student who do not have the access to GIS software an alternative for conducting complex and precise work.

REFERENCE:


