

COMPUTING THE ANATOMY OF TEHRAN

Rule based modelling for growing structures

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1. Tehran - the testing ground

Tehran, Iran's capital is one of the world's fast-growing cities. Over the period of last fifty years, the number of its residents records a twentyfold increase. The consequences are visible in the continually changing anatomy of the city. The problem in Tehran is that the processes of urban growth are difficult to control and take their toll on the environment through air and water pollution, accompanied with the loss of arable land and public realm. The question raised is what role architecture can play in remedying current situation in the city, and how to help steer change of the built environment which is fuelled with the myriad of economic, cultural, social and other influences. This paper explores ways to research, understand and control simultaneous and interconnected processes of urban growth which are escaping traditional planning methodology and often developing their own mechanisms of self-regulation (Kauffman, 1993). The study identifies seven key aspects of the changing city-landscape: traffic, pollution, waste management, water supply, demography, public space and built density. The research is based on the limited data available on the internet and information gathered through in situ observation.

2. Experiment

Initially, a series of schematic drawings were generated to capture causal and mutually causal relationships between the observed phenomena. Secondly, a

series of abstract physical models were made to further develop an understanding of the processes of physical change.

The experimentation is carried during the two week workshop as a part of the Architecture Association Visiting Programme, platform created by the Architecture Association to further extend its educational setting through international engagement and collaboration with a diverse group of local partners and schools.



Figure 1. Architecture Association Visiting Programme in Tehran. Making of models.

3. Discussion

At the end of the workshop, very specific rules were extracted from the schemes and models to form different algorithmic protocols to simulate urban growth. The knowledge acquired is then used to discuss the development of speculative tools for studying and designing highly complex spatial problems through computation, similarly to what is explained by Hoffmeister and Back (1991) in computer science

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References

- Hoffmeister F. and Back T.: 1991. Genetic Algorithms and Evolution Strategies: Similarities and Differences. Lecture Notes in Computer Science, 496. 681–89.
- Kauffman, S. A.: 1993. The Origins of Order Self-Organization and Selection in Evolution. Oxford Oxford: University Press.