INFORMATION ARCHITECTURE OF CITIES

08

Information Architecture and Future Cities

Understanding a city is fundamental for the meaningful design and management of a city. "Information Architecture and Future Cities" opens a holistic view on existing and new cities, with focus on Asia. The goal is to better understand the city by going beyond the physical appearance and by focusing on different representations, properties and impact factors of the urban system. We explore the city as the most complex human-made organism with a metabolism that can be modelled in terms of stocks and flows. We investigate data-driven approaches for the development of the future city, based on crowd sourcing and sensing. You will learn to see the consequences of citizen science and the merging of Architecture and information space. The course describes origins, state-of-the-art, and applications of information architecture and simulation. Both rapidly gain importance in the design of buildings, cities and territories. As course requirement, there will be three short exercises.

## Where
HIT F 22 (Value Lab)

Supervision
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Date	Topic
22.09.2014	Einführung und Überblick. Introduction and Overview
29.09.2014	Das System Gebäude – Klima. Building as a System - Climate (Guest Lecture by Estefania Tapias)
06.10.2014	Das System Gebäude - Konstruktion. Building as a System - Habitat (Guest Lecture by Prof. Dirk Hebel)
13.10.2014	Das System Gebäude – Energie & Habitat. Building as a System - Energy & Habitat
20.10.2014	Seminar week (No lecture)
27.10.2014	Das System Stadt - Soziologie. City as a System - Social Science (Guest Lecture)
03.11.2014	Stocks & Flows - Wasser & Material. Stocks & Flows - Water & Material
10.11.2014	Das System Stadt - Entwurf. City as a System - Design
17.11.2014	Stocks & Flows - Menschen & Informationen. Stocks & Flows - People & Information (Guest Lecture by Matthias Standfest)
24.11.2014	Das System Territorium - Mobilität. Territory as a System - Mobility
01.12.2014	Das System Territorium - Organisation. Territory as a System - Organization (Guest lecture by Prof. Dirk Hebel)
01.12.2014	Final iA critique. Combined critique with the other iA courses (14:00 - 18:00)

People & Information

- Urban System Design
- Exercise 3
- Social Media
- Big Data
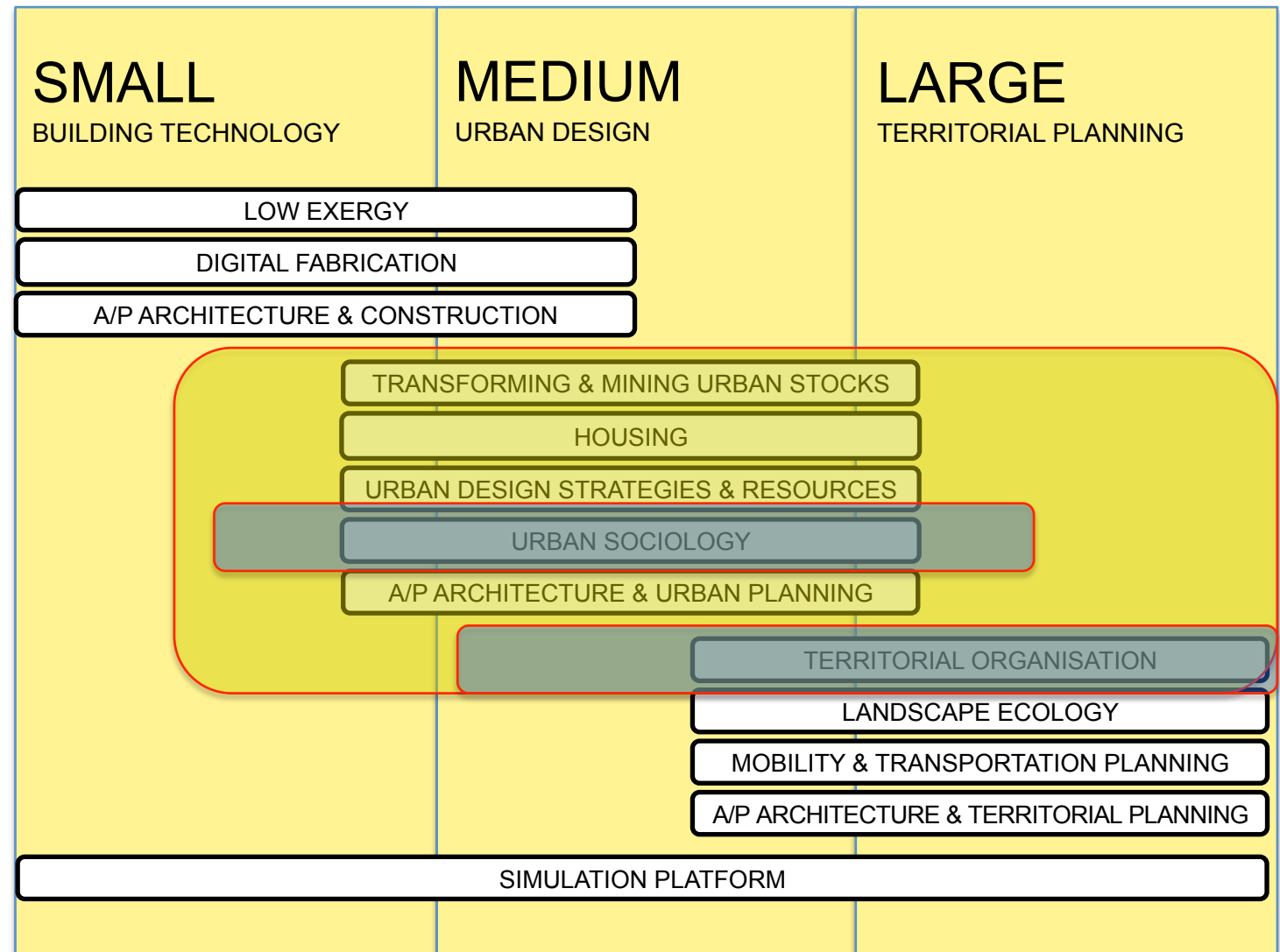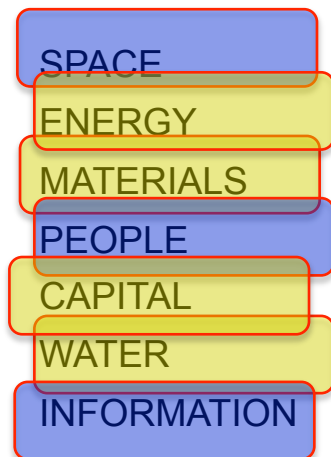
HS 2014 - Exercise 3

TERRITORIAL SCALE

Territories contain cities, cities contain buildings. Yet they do not form a hierarchical system, as the interaction between buildings influences the city as much as the interaction between cities influences the territory. Rather, territories interact with cities and urban systems, if we consider them as entities with a metabolism and that they are functioning in the analogy to the stocks and flows model.

In this exercise you are encouraged to question the traditional definitions and roles of buildings, cities and territories, as novel non-urbanised high-density settlements will significantly influence our future habitat, as well as the architectural and urban design profession.

Non-urban Information Cities

In the past, there were strong boundaries between the city and its surrounding territory, the so-called hinterland. The separation between the city, the villages and the countryside was clear, and so was the hierarchy between them. This situation has changed drastically with the ubiquitous distribution of information technology, particularly the mobile phone and its associated services. The possibility to work at home or from home has changed the life of Swiss citizens, as well as Indian or Brazilian citizens. As the boundaries of the city disappear, urbanized systems, high-density settlements and new forms of habitat - Information Cities - are emerging rapidly throughout the world. Identify and prepare the following:

- Identify and describe two attractive non-urban, non-city settlements which nevertheless show characteristics of an urban settlement

- Identify and describe the most important stocks and flows entering, staying in, and eventually leaving this area

- Describe two approaches how buildings in urban sprawl areas could be transformed from a perceived liability into an asset for the resilience of future cities

Hand in until December 1, 2014 to shin@arch.ethz.ch, with cc to denise.weber@arch.ethz.ch

Urban System Design

The ultimate goal of modelling, simulation, and projection is design. Design is situated outside of science and art, but building on discoveries of both areas. Urban system design is special in that it connects architectural design and territorial design. Informed and responsible parent, system design builds on information and knowledge derived from modelling, simulation and projection.

Urban system design is a new discipline. Situated between naturally and slowly growing cities, between geometrically predefined cities, and between arbitrary growth, it is a challenging, responsible and proactive design activity.

Its foundations should be threefold: the first pillar is the ability to understand, to abstract and to model the urban system. The second pillar is the careful simulation of design ideas, which based on data and information can be placed in and interact with the urban system model. The third step is the projection of various possibilities and the creation of design scenarios that can be discussed with the stakeholders and decision-makers. The design of the final artefact then results in executable plans and multidimensional models, based on which the city can be built or re-built.

Chandigarh, designed by the Swiss architect Le Corbusier in the 1950s, was a social experiment in system design. Le Corbusier was a foreigner to India and the city has developed in a very different direction since then.

Brasilia, inaugurated in 1960, is directly connected to the work and memory of Oscar Niemeyer, and to the Brazilian president of that time, Kubitschek. It could be described as one of the first system design attempts, as it tried to integrate the human, architectural, political, planning, and infrastructure needs of a future city. Oscar Niemeyer was a native of Brazil, but still the city developed differently to what he originally intended.

Shenzhen is the newest of the three examples and there was no grand architectural urban system design scheme at the beginning. This makes it interesting, because in the city of today, more than 15 million people grew organically.
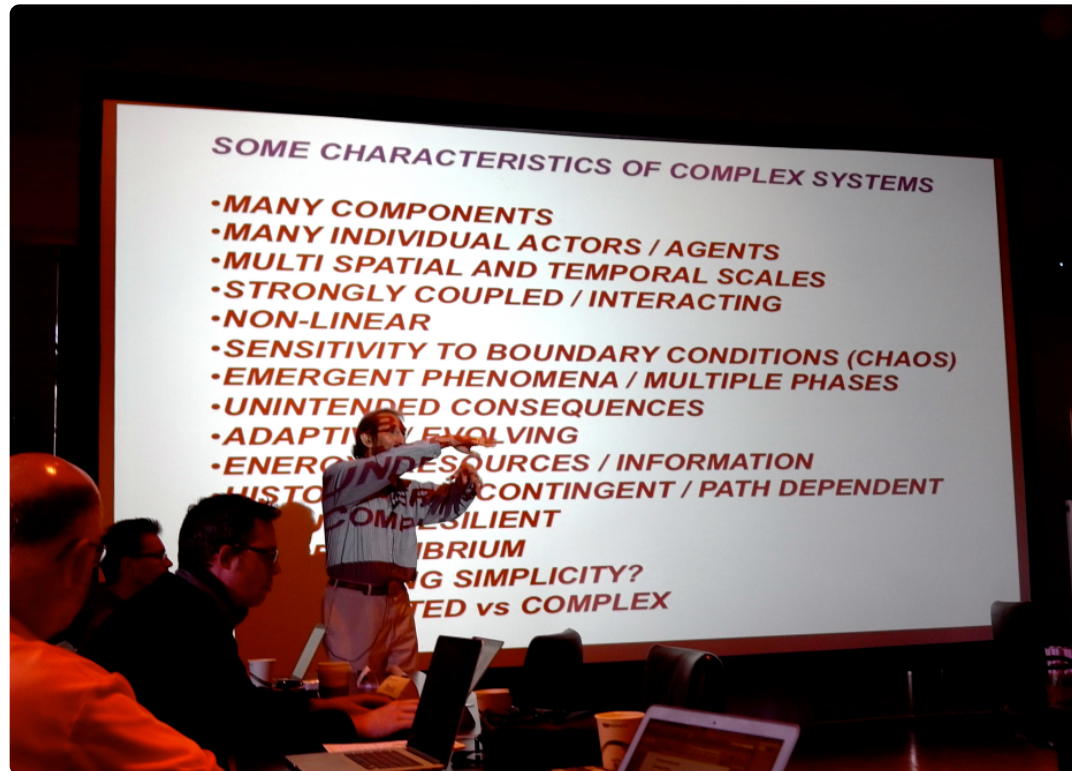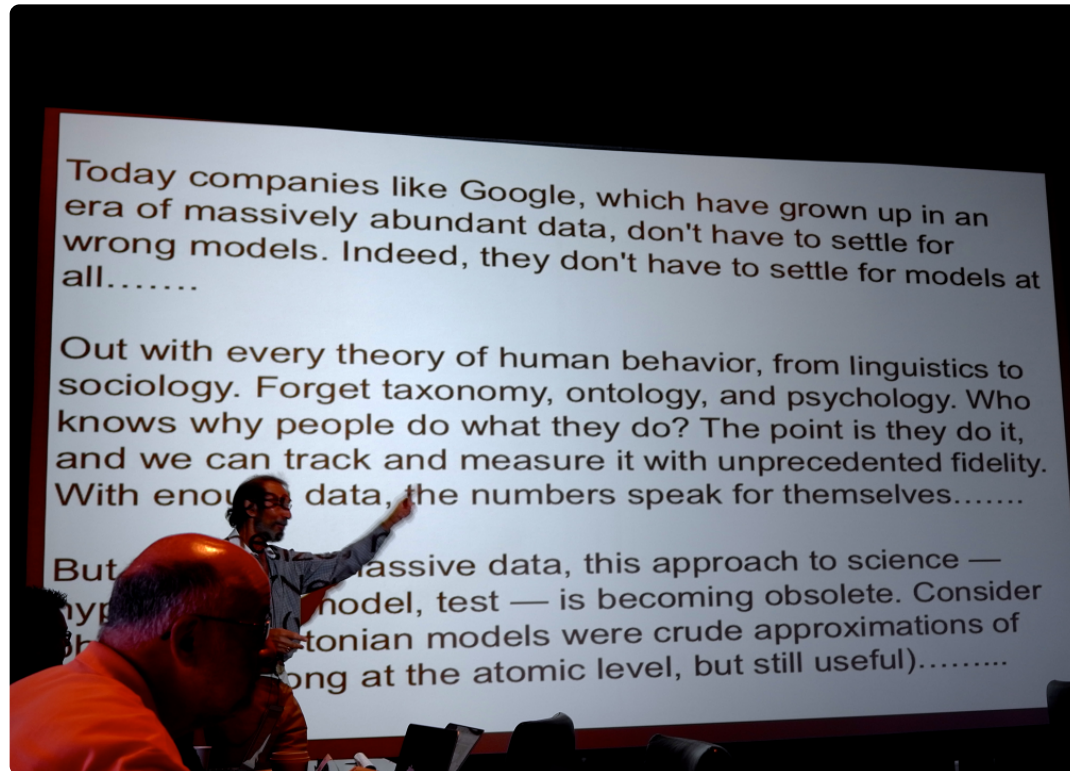
Systems

A **system** defines a set of objects acting together as part of a whole. In the urban context, a system contains buildings, infrastructure, landscape, water and other elements as its parts. Taken together, and adding their individual behaviour and multiple interactions, they form a complex system. Complex systems theory is an important field of science. Its findings are applied to many areas, including urbanisation.

Gallery 10.1 Complex Systems

Schmitt, G. 2013. *Geoffrey West is a leading Complex Systems theorist. physicist, he increasingly focuses on complex urban systems*[Photograph]. Santa Fe Institute.
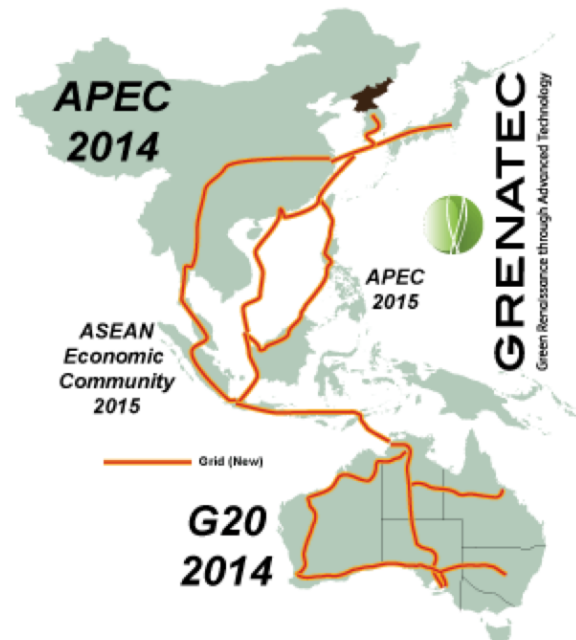
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Gallery 10.2 The Santa Fe Institute

Schmitt, G. 2013. *An altenative view on systems by web companies? Geoffey West at the Santa Fe Institute on September 20, 2013.* [Photograph].

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Both China and Australia want to encourage **economic growth, infrastructure investment, cross-border integration** and **market efficiency**.

**2014:
Year of a
*Pan-Asian Energy
Infrastructure?***

This year's APEC and G20 meetings could lay the foundations for a Pan-Asian Energy Infrastructure.

This can be achieved through building a ***Pan-Asian Energy Infrastructure***. It would be comprised of interconnected cross-border power lines, natural gas pipelines and fiber optic cables.

"Between 2010 and 2020, Asia needs to invest approximately $8 trillion in overall national infrastructure."
"Infrastructure For a Seamless Asia,"
Asian Development Bank, 2009

*"(Asia) must **advance the interconnection of electric grids** across borders to realize maximum efficiency in power generation and delivery."*
"Asian Development Outlook 2013: Asia's Energy Challenge,"
Asian Development Bank

*"The **Trans-ASEAN Gas Pipeline** aims to interconnect the gas pipeline infrastructure of ASEAN Member States and to enable gas to be transported across the borders of the Member States.*
*The **Trans-ASEAN Power Grid,** on the other hand, ensures that gas for power is also being optimized with other potential sources of energy."*
"ASEAN Plan of Action for Energy Cooperation 2010-2015."

*"**If (national electricity) grids were linked up properly,** in a large integrated energy market, then the **peaks and troughs** (of renewable energy generation)**would** be likely to **even out.**"*
The Economist

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FUTURE   未来
CITIES   城市
LABORATORY   实验室

Information Architecture of Cities - Support

- The MOOC – Massive Open Online Course
  - https://www.edx.org/course/ethx/ethx-fc-01x-future-cities-1821
- The BOOK – Basic Open Offline Knowledge
  - Information Cities