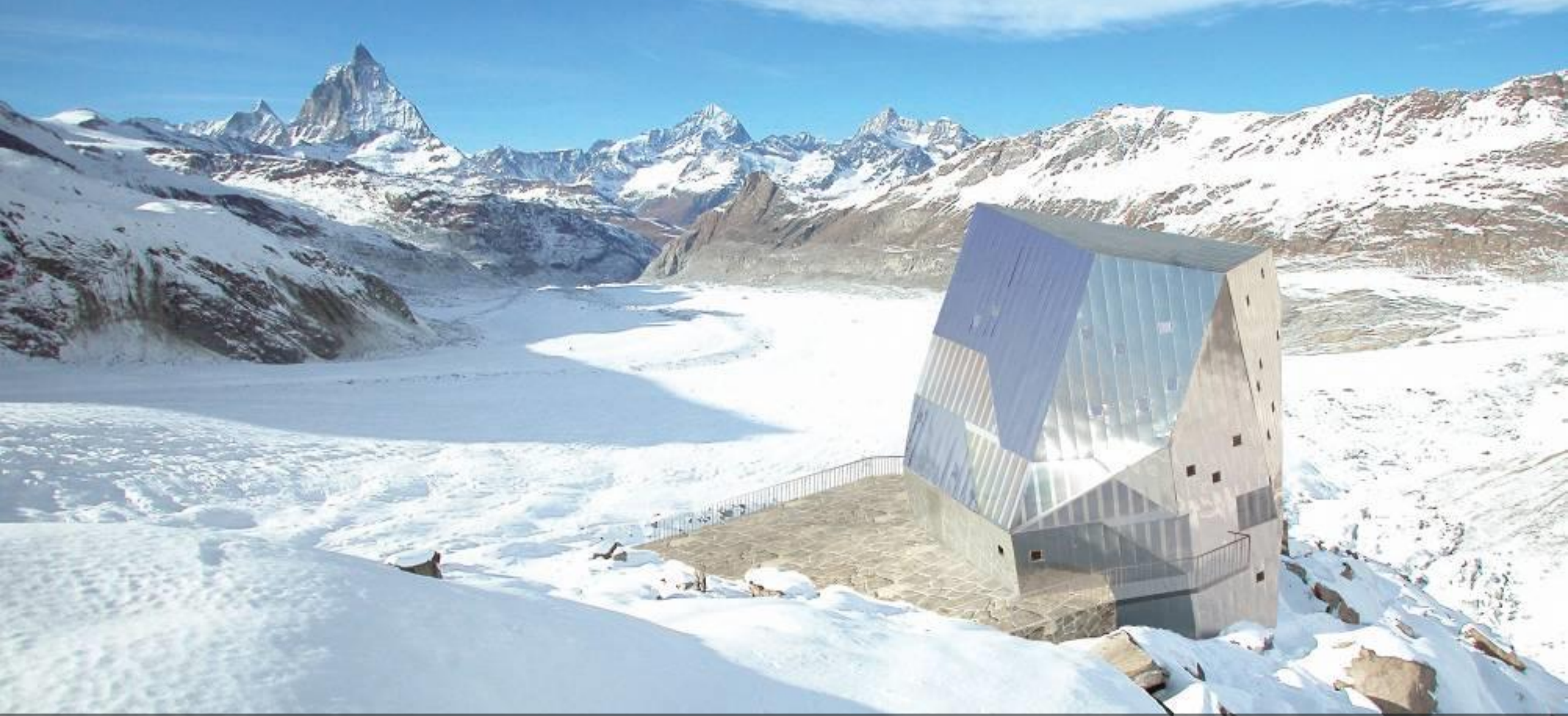


Smart Talk with the Responsive City



Prof. Dr. Gerhard Schmitt
ETH Zürich
Singapore-ETH Centre

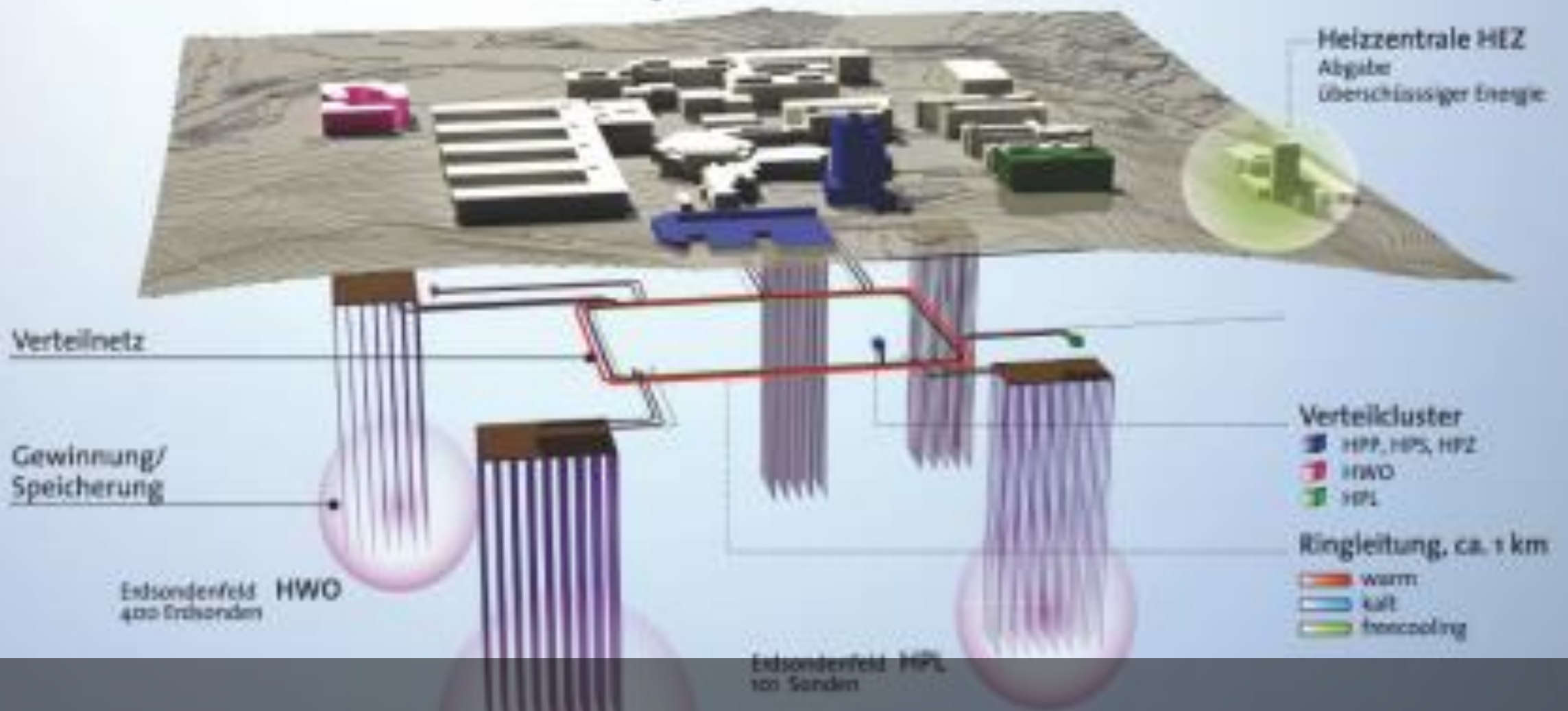
Dire Dawa



Responsive Building ETH

Erdsondensystem in Science City

Verbraucher



Responsive Campus ETH

Smart Buildings - Smart Cities

Smart Buildings

- Control/Prestige
- Security and safety
- Comfort
- Performance
- Design

Smart Cities

- Security and safety
- Services
- Performance
- Comfort
- Urban Design



Smart?



Smart

인천경제자유구역
Incheon Free Economic Zone

Welcome to IFEZ U-City Integrated Operation Center.



„Smart City“ Songdo



Responsive City Wien

Smart City =
Big Data +
Information and
Communication
Technology (ICT)

Smart City Motivations

„Chinese Dream“ (Prof. Li)

- Urbanization
- Industrialization
- Informationizing
- Low Carbon
- Green
- Sustainability

„Swiss Dream“

- Liveability
- Industrialization 6.0
- Domesticate Big Data
- De-carbonization
- Green
- Responsiveness



http://www.srf.ch/var/storage/images/auftritte/konsum/bilder/2015/02/03/node_6101799/77680977-2-ger-DE/image_span12.jpg

DELLA
PUBBLICA FELICITA';
OGGETTO DE' BUONI PRINCIPI,
TRATTATO
DI

LUDOVICO ANTONIO MURATORI

Muratori 1749



Responsive City

=

Citizens

+

Smart City Technology

Cities must
become
responsive — why?

2 billion more people will live in cities 30
years from now





Cities emit 80% of greenhouse gases: industry



Cities emit 80% of greenhouse gases: Mobility

Steps

1. Smart Cities: technology and infrastructure - building blocks for:
2. Responsive Cities: Citizens and their responsibility

Responsive City Instruments

- Citizen Design Science
- Responsive Education



Citizen Design Science



Citizen Design



Citizen Design



Citizen Science

Apr-2016

ETH Zürich

24

A photograph of a building with a dark, textured facade and several windows. On the roof, there is a complex metal structure that appears to be a water distribution system. This structure includes three large, cylindrical white water tanks mounted on a framework. Above the tanks, there are solar panels. To the left of the tanks, there is a large, flat metal platform or canopy supported by a network of pipes and beams. The sky in the background is a pale, hazy blue.

Citizen Science

A photograph of a curved library or museum display. The shelves are filled with books, and several shelves contain scientific specimens, including a human skull, various bones, and other anatomical structures. The lighting is warm and focused on the shelves. On the right side, there are framed anatomical drawings or sketches of human figures.

Design Science



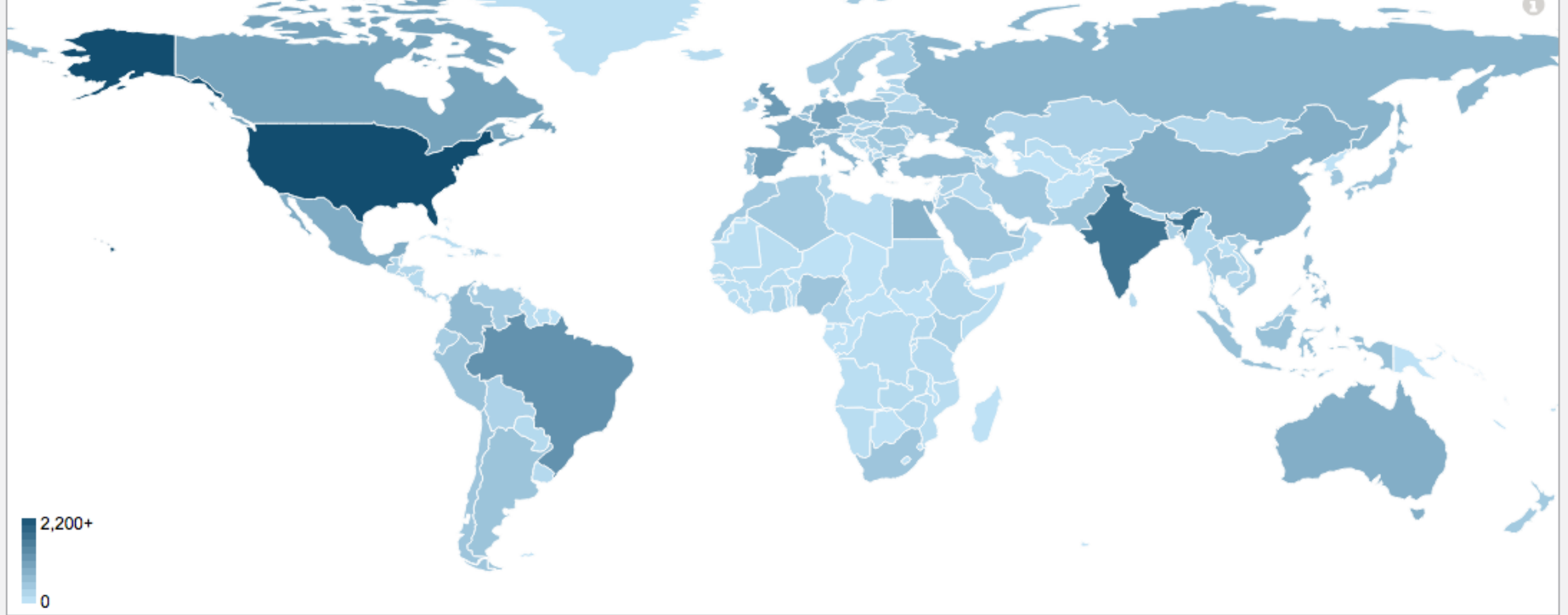
Design Science

Responsive Education

Massive Open Online

Courses (MOOCs) -

democratizing education



Geography Metrics

166

Total Countries
Represented

United States

Top Country by
Enrollment

India

Second Country by
Enrollment

Brazil

Third Country by
Enrollment



1. 4 clusters are formed to promote connectivity and accessibility.
2. The arrangement of each cluster enable visibility and centrality, also enhance natural ventilation through street canyons.
3. Open space within each cluster provide a safe area for daily physical activities and encourage community participation.

Write a review



👍 2016.11.13 - 22:48 - Cell Core



👍 2016.10.18 - 21:00 - KR edX student



Reset camera position



How-to: mouse & finger controls



Toggle fullscreen



Control panel



Tools



Teaching driven research



Citizen design platform

Design Example

Best Design From MOOC Users' Voting

Author's annotation

Hangxin's annotation

Public spaces

Two different of building clusters

Built along the block edges

High buildings are placed outside

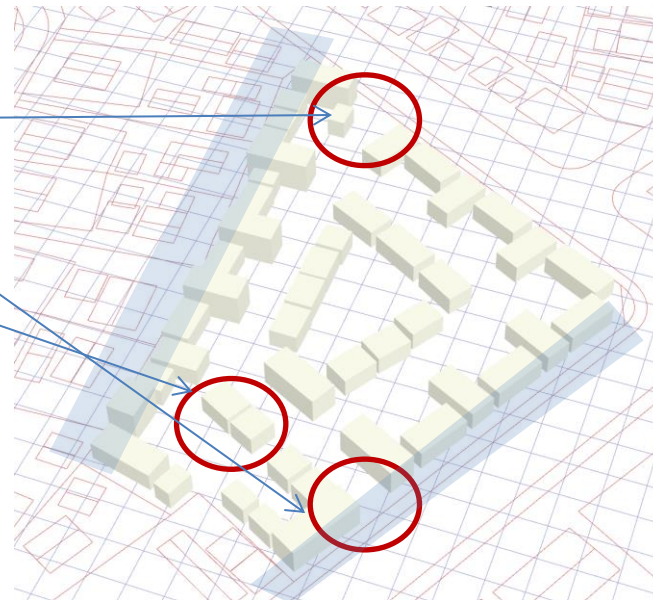
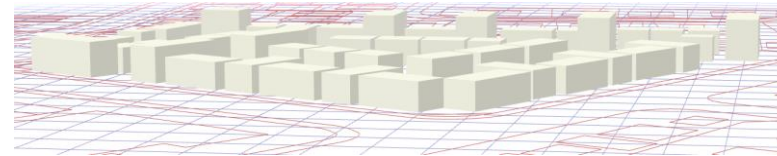
Entrance of building blocks

Unexpected blocks

Bad separations between main road and site

Not good access to the neighboring blocks

Gaps between every buildings



"I designed the layout based on the type of community this place strives to become. It's not a posh locality and thus in an informal neighbourhood like this, the immediate neighbours become one's family. The units have been arranged in a pattern that 'Small clusters'(with no particular set/type of units). Each of these clusters have an **open area** (like a play area/sit out space/ courtyard) for themselves. But they are placed such that each of these **are mutually accessible** in terms of **connectivity** and **visibility**.

The site has **two main access** roads through it. They are not perpendicular to the main roads in order to decrease visibility from outside(of the units and spaces between them for **safety** reasons). They decrease the **distance to be travelled** by each person to exit the site. There are smaller streets that connect and make each block accessible. I have assumed that the community is not gated, thus the clusters closest to these openings have been designed as **introverted spaces**(rather than completely open).

All the clusters have been laid out around a **central cluster** which encloses a large playground(this can be landscaped and playground equipment can be installed)This can become a space used by the whole community and by people from all age groups. It has been given access on 4 sides.

Another criteria I kept in mind while planning was the **North direction**(approximately along that corner of the site that lies at the intersection of the main roads). South Africa has a rather **hot climate** and so in order to **reduce heat gain** in each block, I tried to refrain(in most cases) from orienting the longer sides of each block along East-West direction."



Scores:

Visibility

Centrality

Connectivity

Accessibility

82

90

81

86

Citizens vote on design

Take Home Messages

Future Cities must be
livable and responsive



Future City Zürich 2100

Responsibility is the
foundation of Responsive
Cities



Responsive Learning

From

Complaining

To

Designing



Citizen: Design: Science



Citizens: Negotiate!



Governments: Engage Citizens!



Universities: Independant Research!



Universities: Design!

Philippe Block, ETH Zürich



Universities: Build!

Sacha Menz et al, ETH Zürich

A black and white photograph of a cave interior. A large, smooth, light-colored rock formation, possibly a stalactite or a large piece of ice, hangs from the ceiling in the center. To the left, a bright light source illuminates the cave walls, creating a strong contrast with the dark, shadowed areas. The overall atmosphere is mysterious and dramatic.

Universities: Design!

Christian Kerez, ETH Zürich



Universities: Build!

Sacha Menz et al, ETH Zürich

Machen wir die Stadt der
Zukunft zum besten und
MOST RESPONSIVE PLACE,
in dem Menschen je gebaut,
gelebt und gearbeitet haben!



Vielen Dank für die Aufmerksamkeit