

DEEP CITY

DESIGNING A HOME FOR POST-2020 ZÜRICH



ATELIER HUANG FALL 2020

In October 2018, Christie's auctioned "Portrait of Edmond Belamy," a first AI artwork created by the arts collective Obvious, composed of three 25-year-old Parisian students. The painting, which sold for \$432'500 after a protracted bidding war, was generated by a type of machine learning algorithm known as GAN (generative adversarial network). A manifesto, printed on a small pamphlet, accompanied the artwork: "creativity is not only for humans".

With the recent advances in AI and deep learning, machines have been suspected (and proven) to not only play a hand in creating paintings, but also infiltrating contemporary creative culture – e.g. in writing award-winning scripts for blockbuster movies in Bollywood, inventing catchy melodies for billboard topping k-pop music, and generating trend-setting haute-couture fashion for the runways in Paris.

Architecture has also been the object of AI and deep learning. Well known examples include automatically generated floorplans and dreamy interior views that resemble buildings like the Sagrada Familia in Barcelona. AI has the potential

to not only capture the essence of a set of images, accurately depicting the mood and style, but also uncovering subtle details that would otherwise be overlooked by human eyes.

In this studio, AI will be our „telescope“ through which we will rediscover our built environment. We will critically question the role of artificial intelligence and deep learning in architecture. Is creativity in architecture only exclusive to humans? Can machines automatically learn and generate meaningful architecture? Can they go beyond quantifiable data and optimization and enter the realm of architectural quality? Can machines capture and generate something as fragile and elusive as "genius loci"? What are the dangers and dark sides when we let the machines loose?

Following on our studio last semester where we looked at the primitive hut in the swiss alpine context, this semester we will look at the city of Zürich and explore the idea of „Home“ in post 2020, after the rise of the first waves of pandemics and confinement. We are interested in the home not only as the shelter for domestic life, but also in the notion of „Heimat“ and the identity a house

can produce. Images are powerful vehicles for these ideas, and we will use AI to process images to capture, collect, and learn the architectural DNA of the local identity and the visual characteristics that constitute the genius loci, in our case the identity of Zürich Altstadt. What is Zurichness?

While images of house exteriors (street-views, facades, axons) convey the identity of a place and neighborhood, they also reflect the functions inside the house, such as domestic life-styles, societal status, internal organizational hierarchies. Here architecture provides the structural framework.

The recent confinement during the Covid -19 crisis has uncovered the limits of today's housing typologies, highlighting an increased misalignment between their affordances and emerging life styles - where living and working converge, and everyday social activities, such as shopping, learning, entertainment have moved from the city into the intimate confines of home. This studio asks students to rethink a typical housing unit in the Altstadt of Zürich and explore the possible transformation of the urban house as a typology where increasingly (almost) everything takes place.

The first part of the semester will consist of curating data and manipulating a GAN to generate variations of housing units by learning from the Altstadt Zurich. The collection of façades will serve as samples for the algorithms. Students will select and interpret the output generated by the algorithm, and, through a process of inverse geometric projection, transform the machine-generated images into 3D architectural forms.

During the second part of the semester, students will confront the architectural forms generated by the GAN algorithms with imagined scenarios of domestic life post 2020, emphasizing spatial and temporal flexibility. This creative confrontation will result in a series of proposed Zurich Altstadt housing “proto-typologies”, presented as schematic, axonometric drawings.

The studio will culminate in a personal interpretation of the post 2020 house on a precise, specific site in Altstadt Zurich, as a final project: a privileged, virtually public and flexible, yet physically private and intimate space, amidst a changing world and confused ecology.



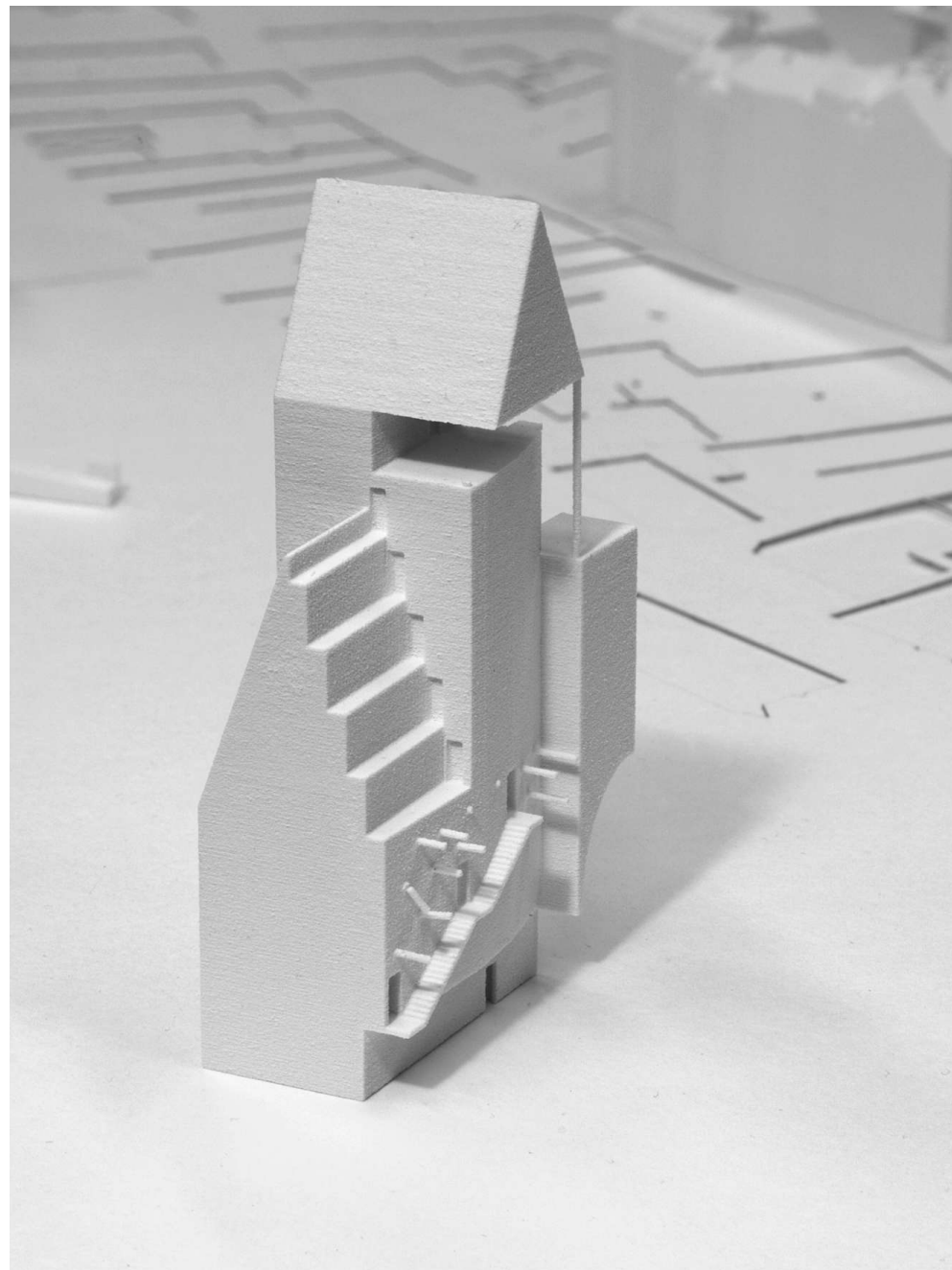
George Braun, Franz Hogenberg
 Etching (Planvedute) of the City of Zurich, 1581



Aldo Rossi, ETH Zurich
Zürich Grundrissplan Erdgeschoss "Rossi - Plan", 1974



Aldo Rossi, ETH Zurich
Zürich Grundrissplan Erdgeschoss, 1974

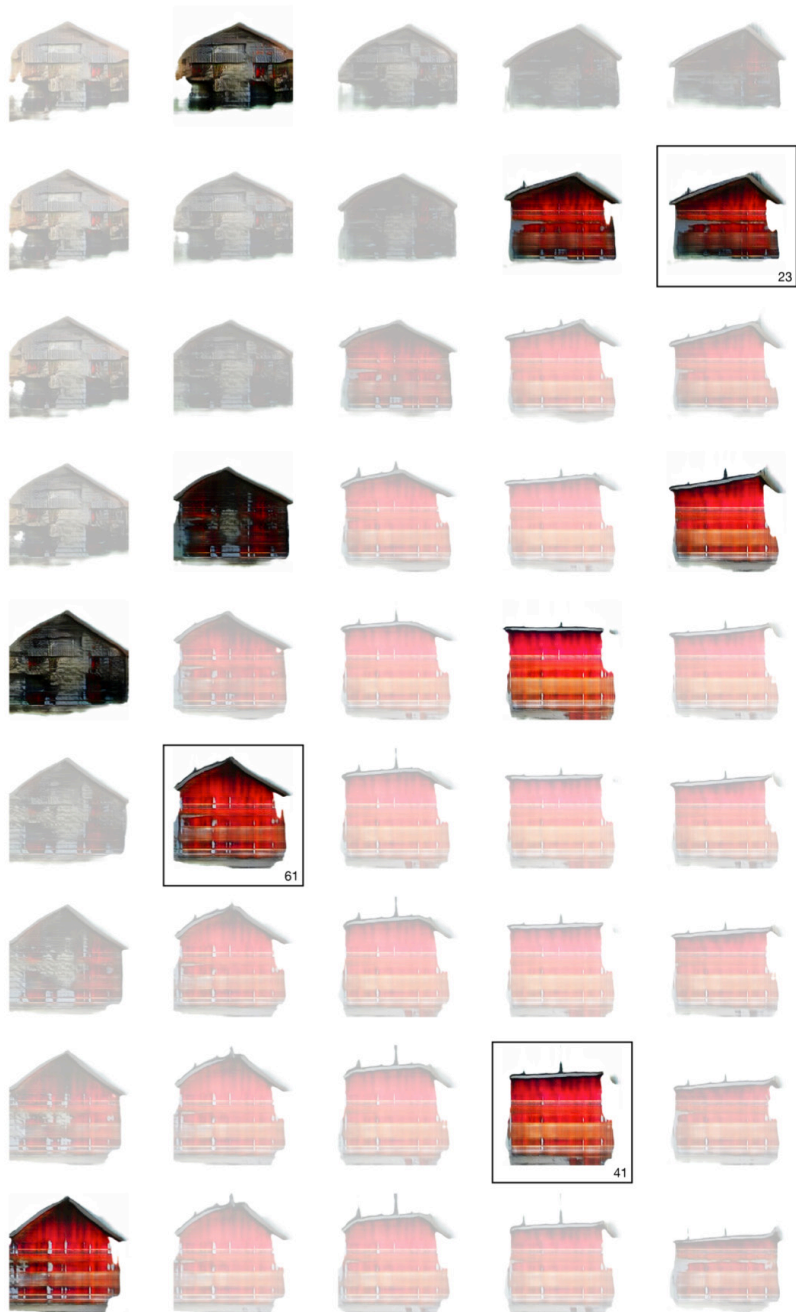


Magdalena Osiniak
Boundaries of Niederdorf, 2017

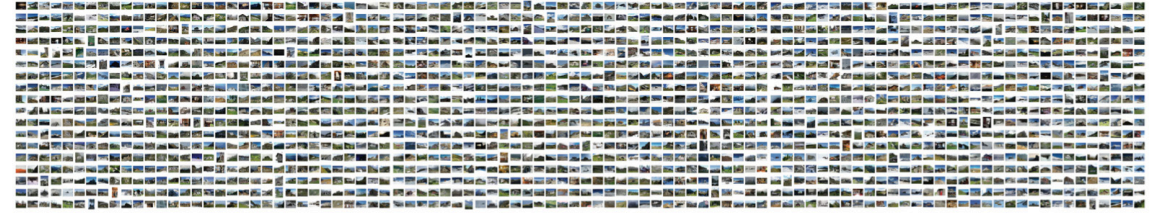


Magdalena Osiniak
Boundaries of Niederdorf, 2017





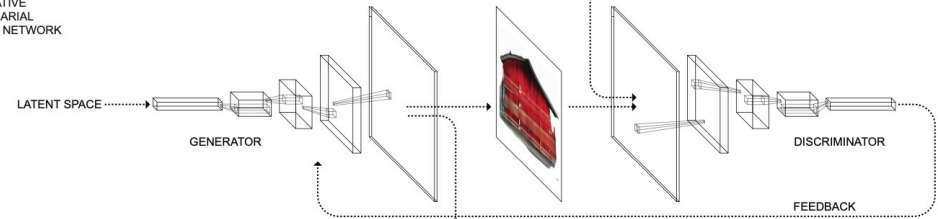
CONTEXT



DATA

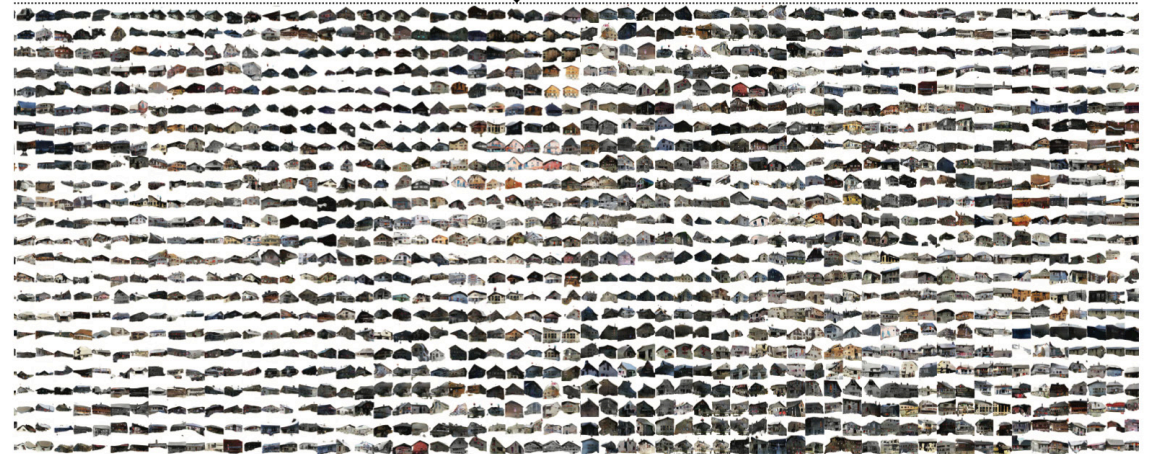


GENERATIVE ADVERSARIAL NEURAL NETWORK



<https://vimeo.com/421472240>

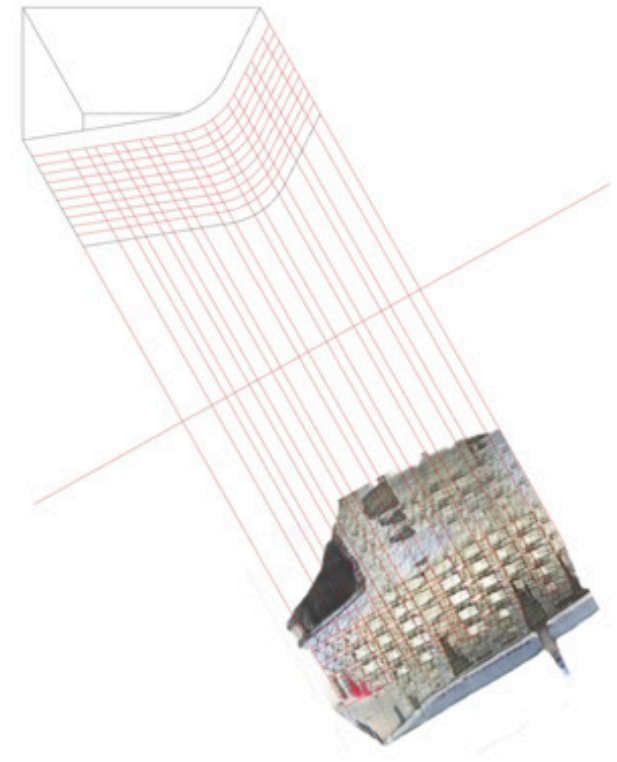
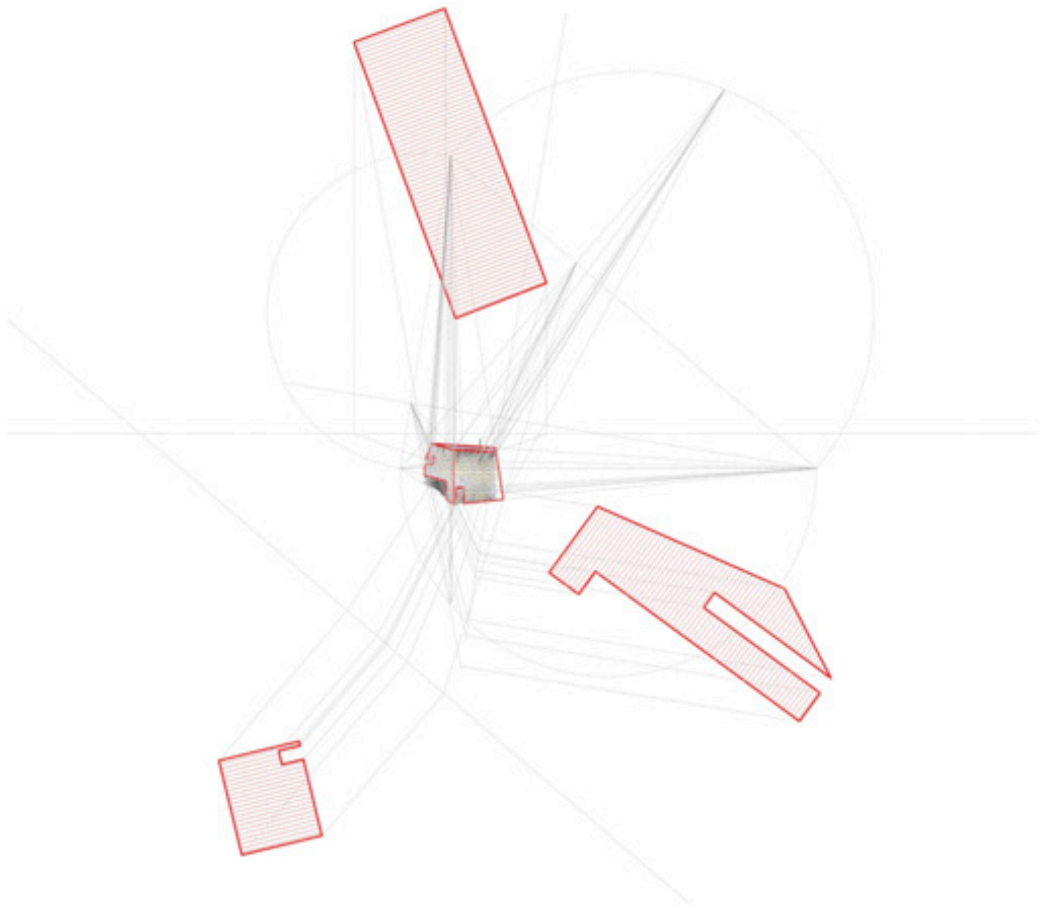
MACHINE GENERATED ARCHITECTURE

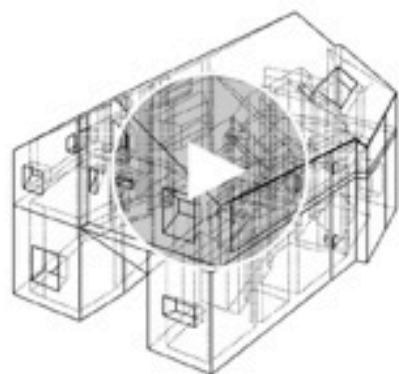
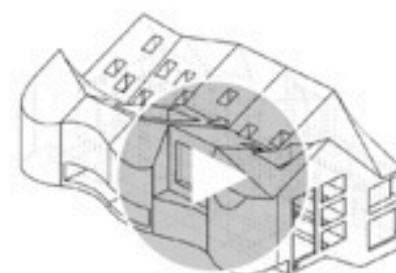
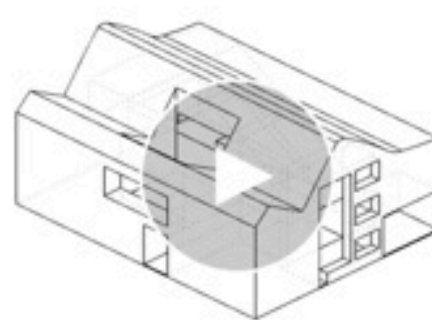


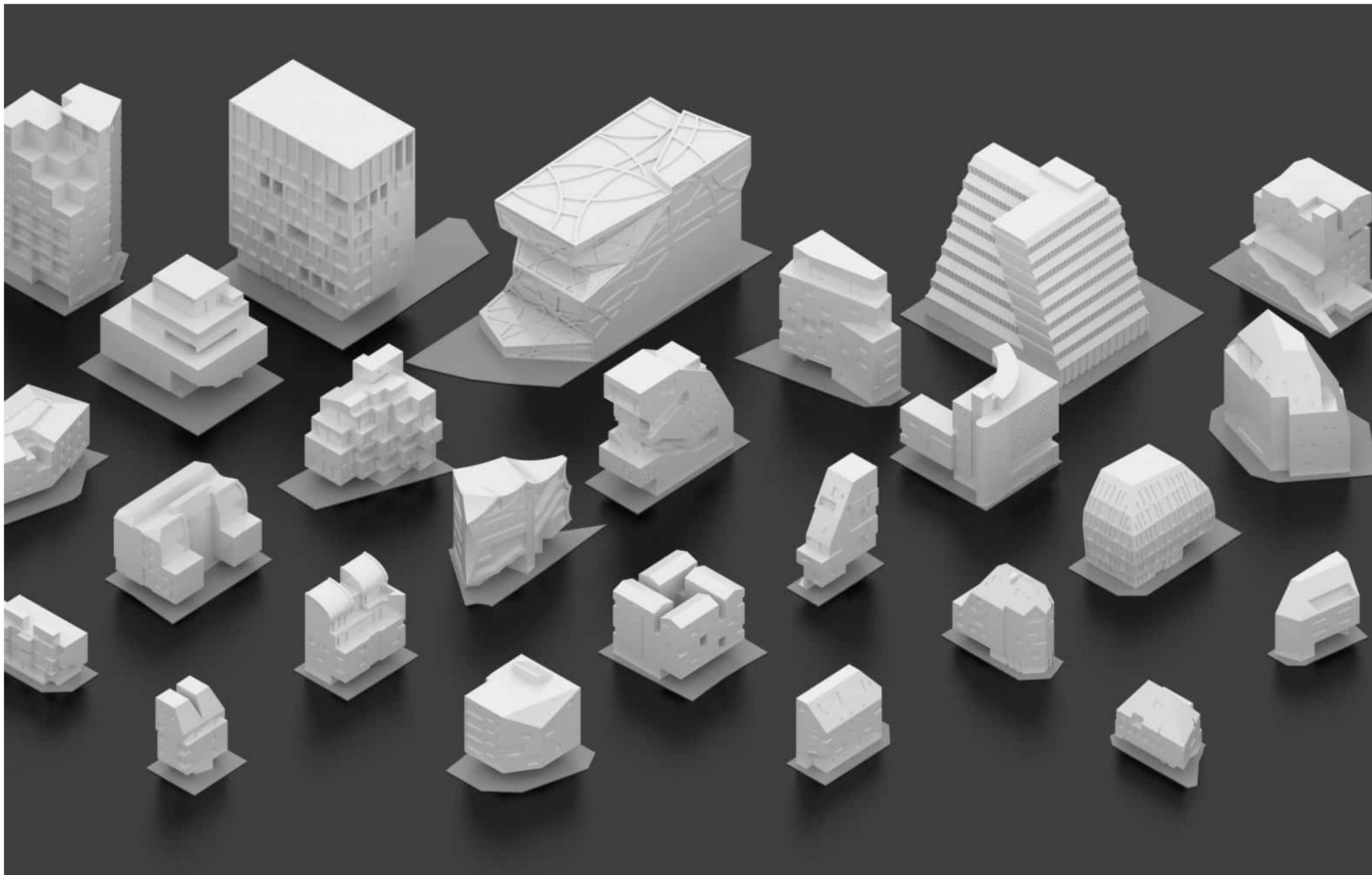


MxD Lab, Atelier Huang, EPFL
Refuge 2.0 - Artificial Swissness, 2020.

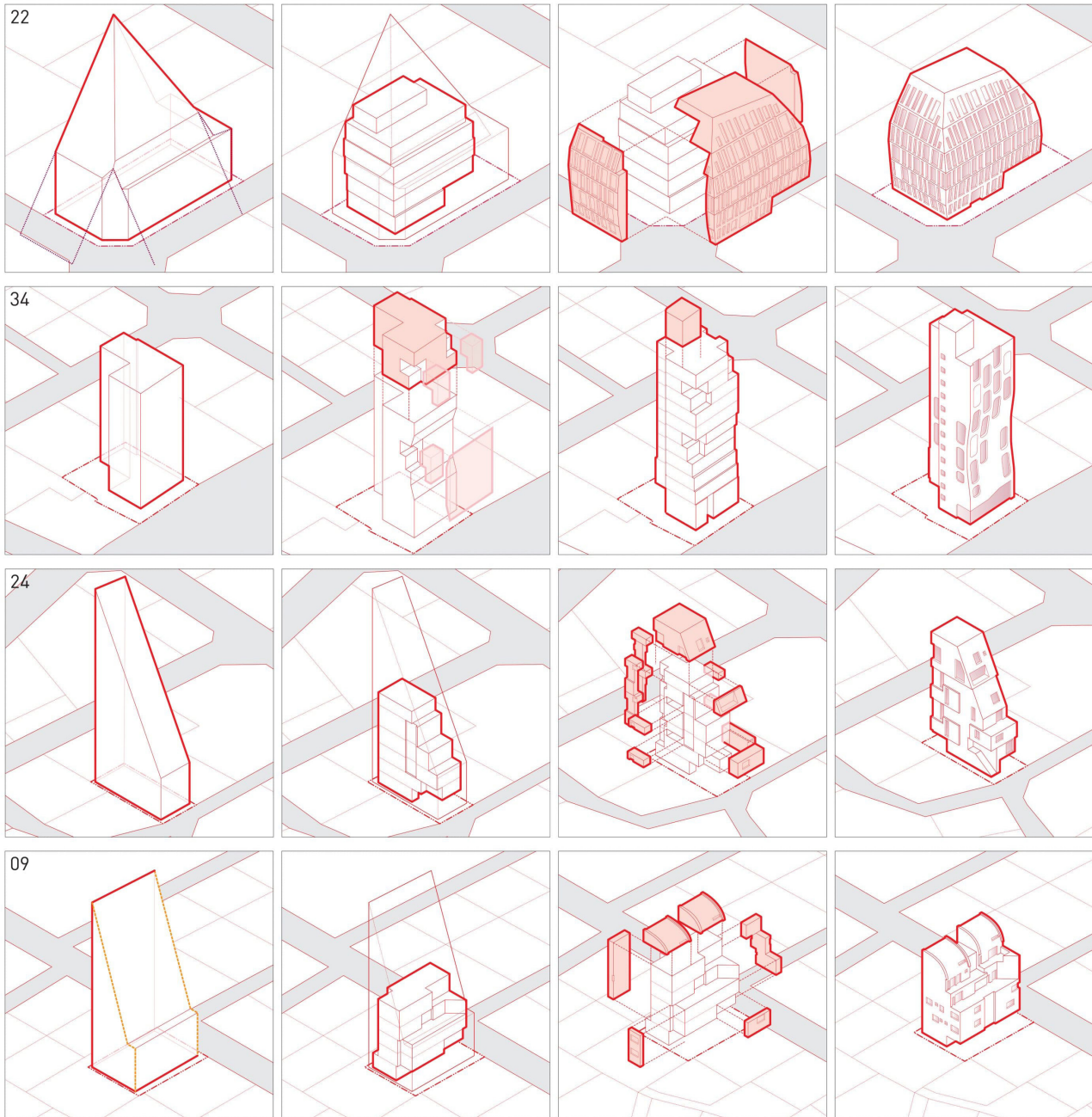




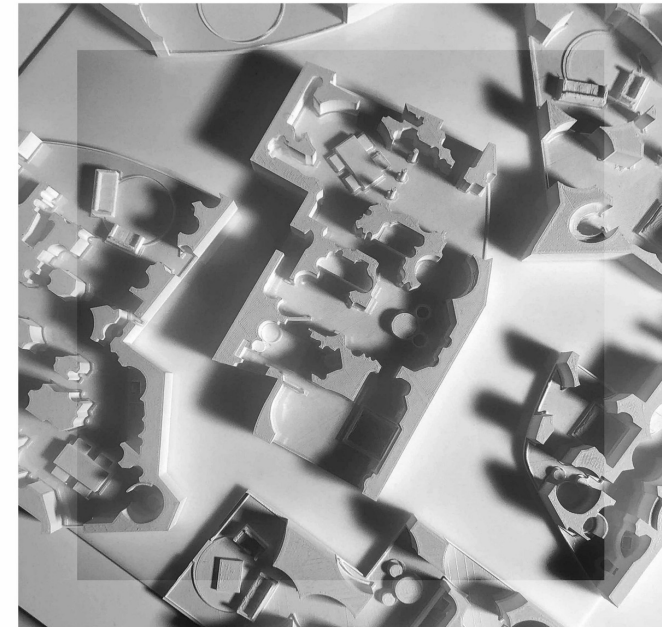
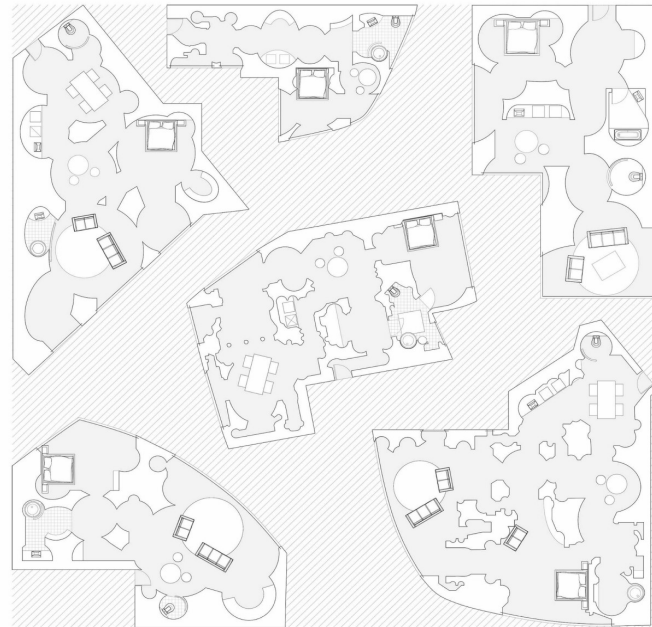
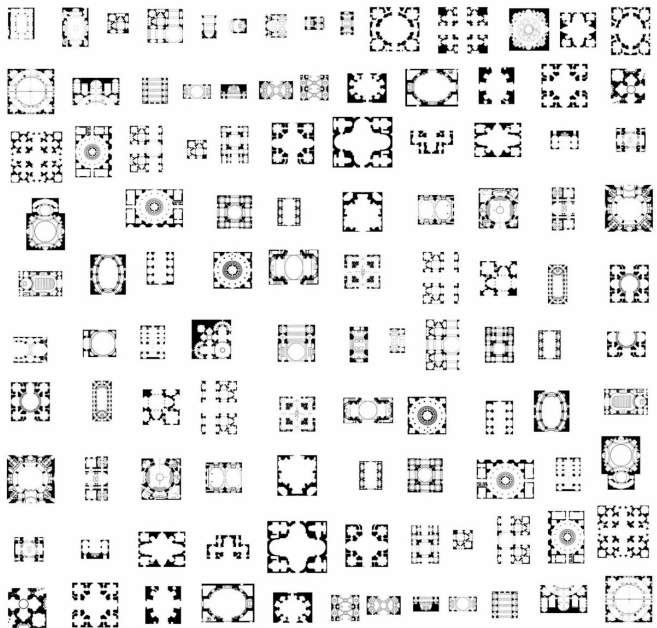
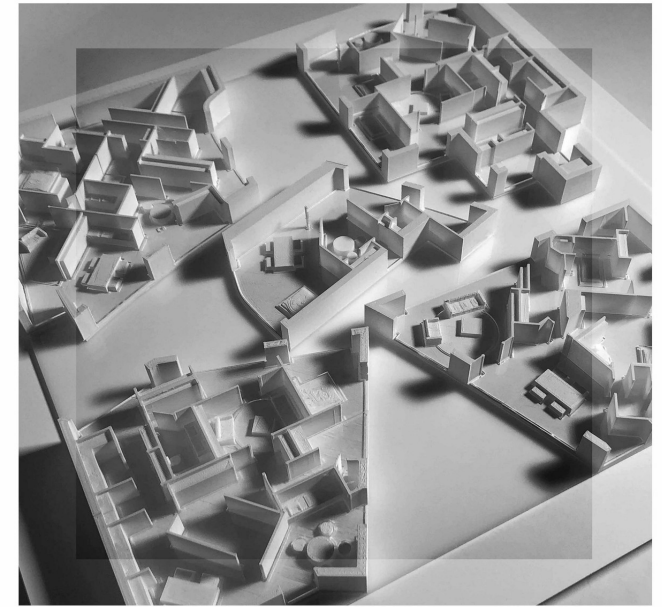
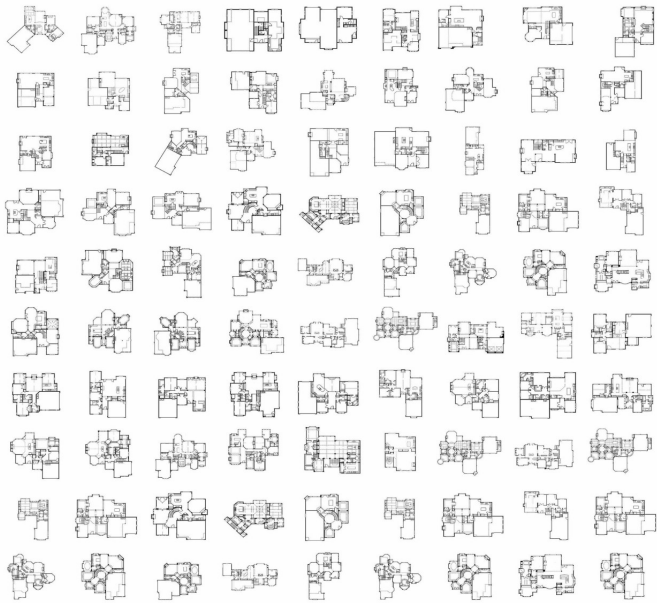




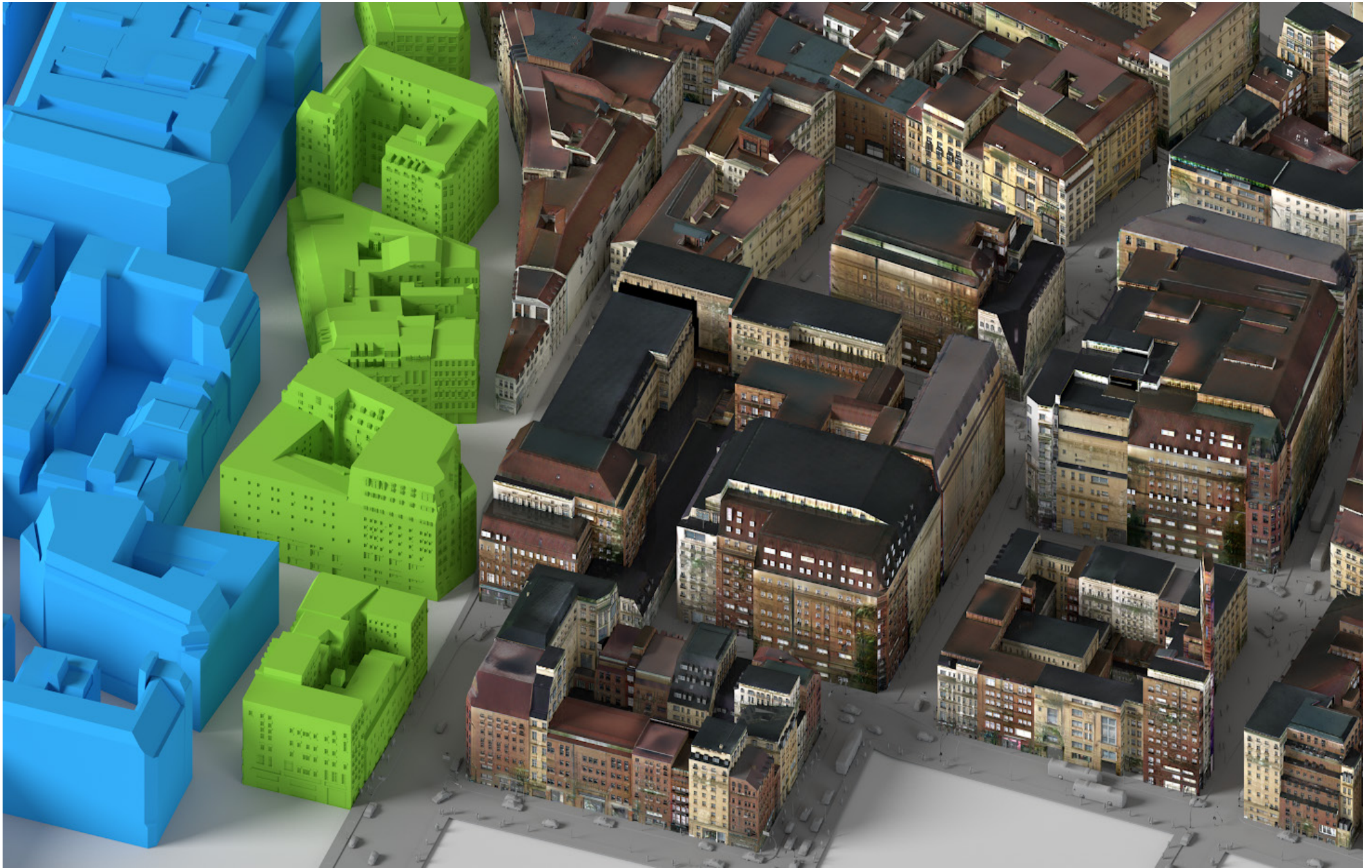
Sung Ho Kim, Arts Council Korea
The FAR Game, *Venice Biennale Korean Pavillion*, 2016.



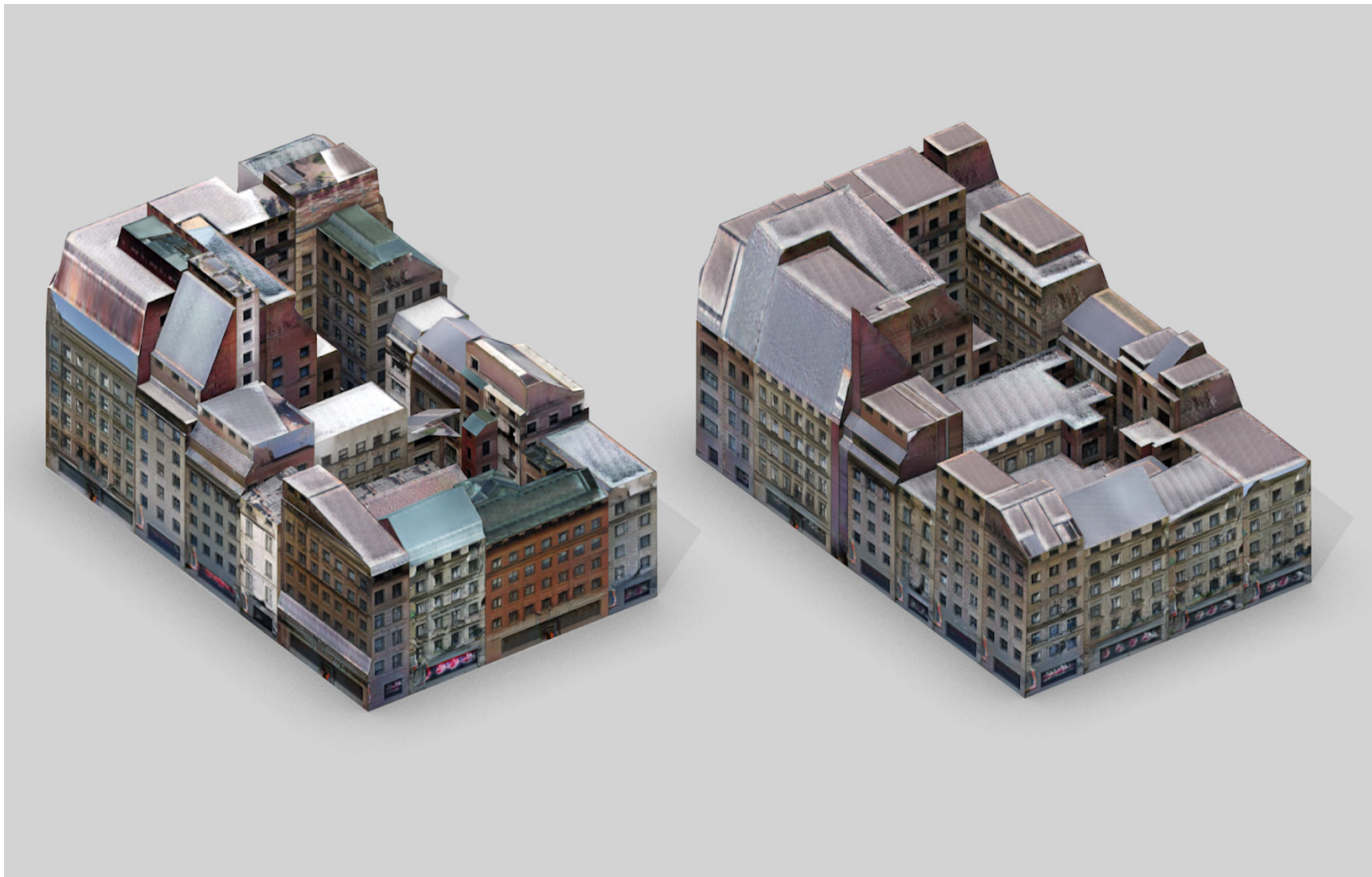
Sung Ho Kim, Arts Council Korea
 The FAR Game, *Venice Biennale Korean Pavillion*, 2016.



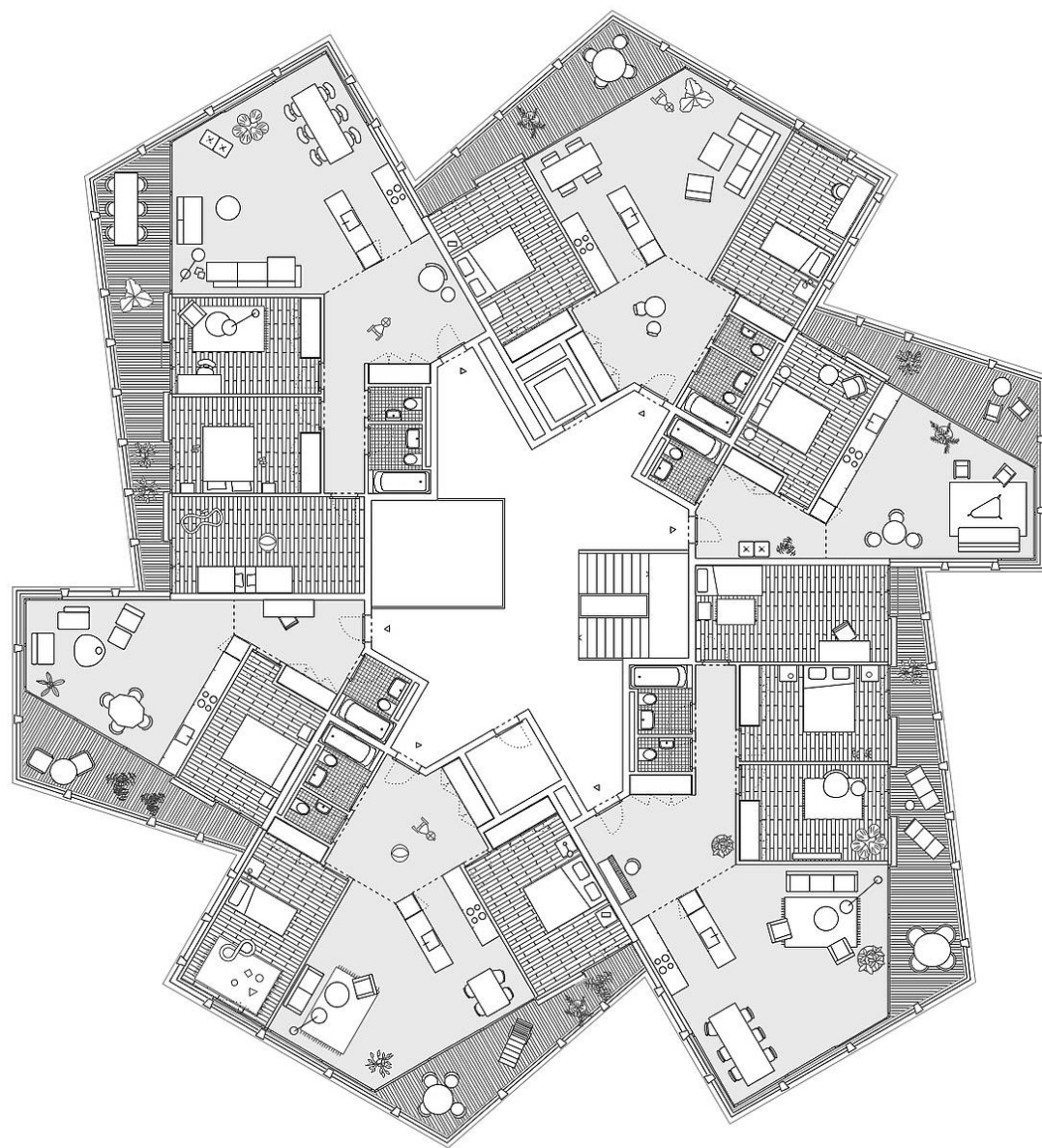
Stanislas Chaillou, Harvard GSD
A New Frontier for AI in Architecture, 2019.



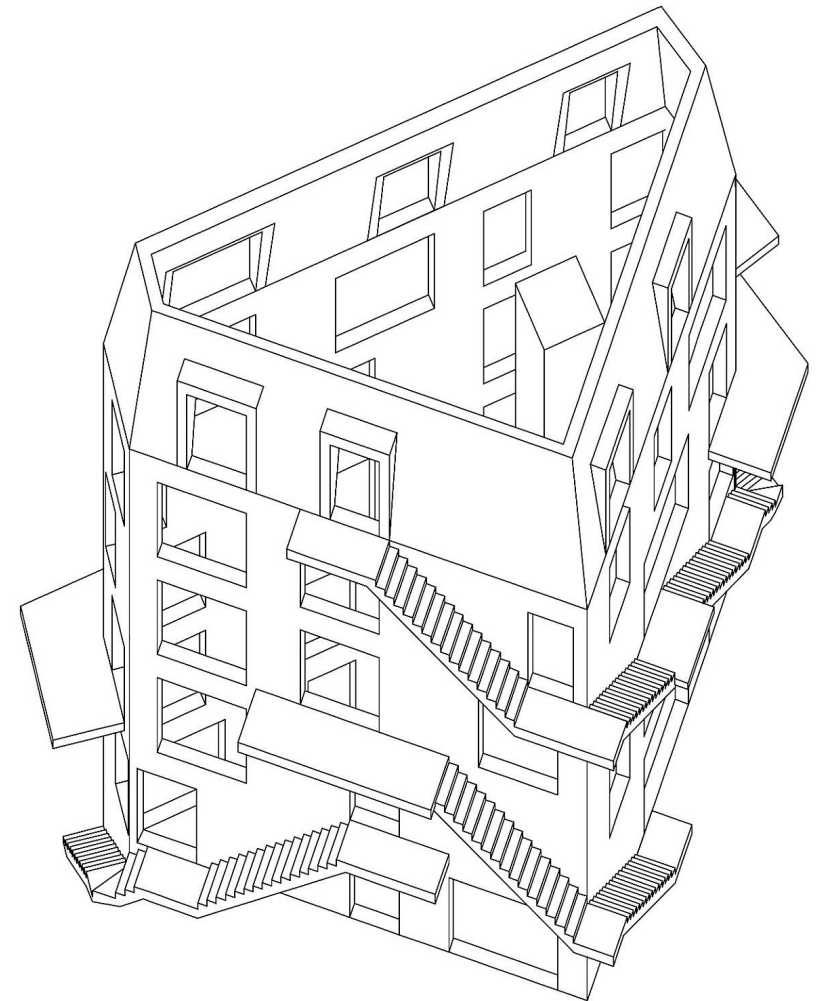
Tom Kelly, Paul Guerrero, Anthony Steed, Peter Wonka, and Niloy J. Mitra
FrankenGAN: guided detail synthesis for building mass models using style-synchronized GANs, 2018



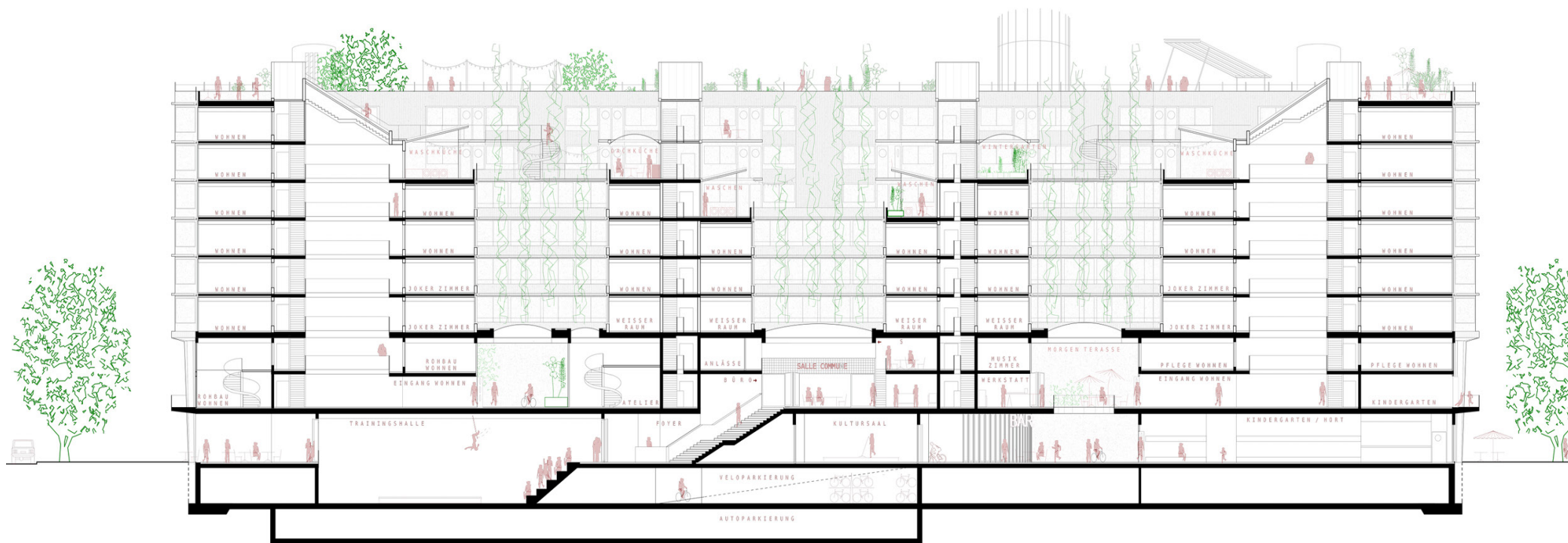
Tom Kelly, Paul Guerrero, Anthony Steed, Peter Wonka, and Niloy J. Mitra
FrankenGAN: guided detail synthesis for building mass models using style-synchronized GANs, 2018



Dreier Frenzel
Logements Grands Esserts Veyrier, 2015



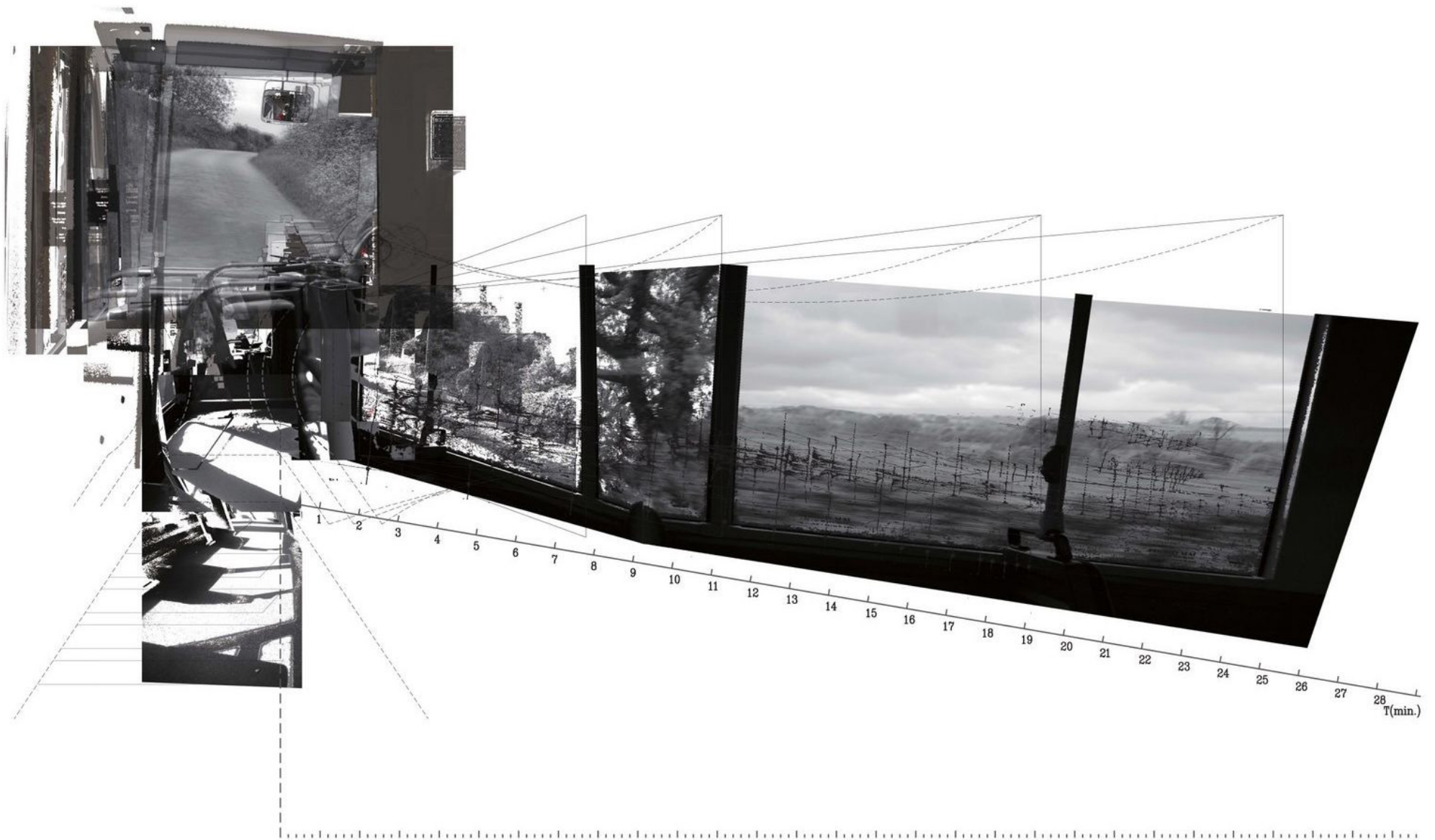
Dreier Frenzel
Immeuble Verdeaux à Renens, 2018



Studio Trachsler Hoffmann
Kraftwerk 1 Bau- und Wohngnossenschaft in Zürich, 2020



Schneider Studer Primas Architekten
Zwicky-Süd, Zürich-Dübendorf, 2017



Diller + Scofidio, Elizabeth Diller, Ricardo Scofidio
Slow House Project, North Haven, New York, 1989



Diller + Scofidio, Elizabeth Diller, Ricardo Scofidio
Slow House Project, North Haven, New York, 1989



Hariri & Hariri
Digital House (The Un-Private House, MOMA), 1999



Hariri & Hariri
Digital House (The Un-Private House, MOMA), 1999

Important Dates

Fall, 2020

Studio Introduction

Sep 14

Altstadt Sampling

Sep 15-21

Phase I: Learning Zurichness

Sep 22-Oct 16

Phase II: Spatial Translation/Proto-typologies

Oct 17-Nov 8

Studio trip to Zurich

Nov 9-10

Phase III: Design Proposal

Nov 10-Dec 1

Phase IV: Representation and 3D Prints

Dec 1-14

Final review

Dec 15

The studio theme spans the entire academic year of 2020/21.

Accordingly, there will be continuity between the fall and spring semester, but each semester can be followed independently.

Dates are subject to change.

Prior programming experience is not required.

Team

Media x Design Laboratory

Prof. Jeffrey Huang

Christina Doumptioti, Christoph Holz,

Mikhael Johanes, Frederick Kim,

Gianna Ledermann