URBAN ASSEMBLAGE: THE CITY AS ARCHITECTURE, MEDIA, AI AND BIG DATA.

• Paper / Proposal Title:
GAN’s, Symbols and the City – Deep Neural Networks and the Rise of Unseen Urbanities

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• Abstract (300 words):
This paper strives to interrogate the abilities of machine vision techniques based on a family of deep neural networks, called Generative Adversarial Neural Networks (GANs), to assemble or construct new urban planning solutions. The basis for these processes is a large database of particular urban design solutions, divided into two separate learning classes: Urban Textures and Terrain Variations. The proposed algorithmic technique leverages the large amount of structural and symbolic information that is inherent to the design of urban planning solutions (Urban Textures) throughout history to generate novel, unseen plans. In this area of inquiry, questions such as creativity, agency and authorship are discussed, as neural networks are capable of creating solutions currently unknown to designers. These can range from alien morphologies, to advanced programmatic solutions. This paper is primarily interested in interrogating the second, existing but uncharted territory.

It is almost impossible to judge plans of cities on a purely utilitarian level. The planning process is directly impacted and influenced by economic environments, material preferences, political conditions and stylistic fashions of the time the design was created.
In both cases it is not surprising that the intrinsic matter of planning on a large scale involves utopian ideas as well as aspects of ideology. The examples demonstrate that urban maps in particular can represent and symbolize abstract concepts that span ideologies beyond shape, geometry and aesthetics to encompass political, social and economic conditions. It might not surprise that in this extent, Plans also represent a vessel and repository of the history of urban design imaginations, and as such can be considered an enormous mine for new ideas on the nature of architecture. Therefore, at its most basic level, the planning process is rooted in the inherently human ability to not only perform pattern and symbol recognition but also pattern and symbol generation.

• Author(s) Biography (200 words each):

Dr. Matias del Campo

Matias del Campo is a registered architect, designer and educator. Founded together with Sandra Manninger in Vienna 2003, SPAN is a globally acting practice best known for their application of contemporary technologies in architectural production. Their award-winning architectural designs are informed by advanced geometry, computational methodologies, and philosophical inquiry. This frame of considerations is described by SPAN as a design ecology. Most recently Matias del Campo was awarded the Accelerate@CERN fellowship, the AIA Studio Prize and was elected into the boards of directors of ACADIA. SPAN’s work is in the permanent collection of the FRAC, the MAK in Vienna, the Benetton Collection, and the Albertina. He is Associate Professor at Taubman College for Architecture and Urban Planning, University of Michigan. The practice’s work was featured at the 2012 Venice Architecture Biennale, at ArchiLab 2013 at the FRAC Centre, Orléans, France, the 2008 and 2010 Architecture Biennale in Beijing, and in the solo shows ‘Formations’ at the Museum of Applied Arts (MAK, 2011) in Vienna and ‘Sublime Bodies’ at the Arch Union Gallery in Shanghai (2018). Currently their work is on show at the Vienna Biennale 2019, the Austrian Cultural Forum in NY (Resident Alien Exhibition) and the Buenos Aires Biennale 2019. Most recently Matias del Campo guest edited an edition of AD, Architectural Design published by Wiley in London.

Dr. Sandra Manninger

Dr. Sandra Manninger is principal of del Campo Manninger Architects, a company she founded with Matias del Campo in 2003. The practice focuses on the integration of advanced design and building techniques that fold nature, culture, and technology into a design ecology.
Manninger’s work is part of the permanent collection of the FRAC Centre in Orleans, the Luciano Benetton Collection, and the MAK-Vienna and the Albertina Museum. She has been published in numerous magazines and books, has presented at numerous conferences around the world, and taught architectural design at the UIC Barcelona School of Architecture; the University of Applied Arts in Vienna; the Technical University in Vienna; the DIA Dessau Institute of Architecture in Dessau, Germany; Tsinghua University in Beijing; Tongji University in Shanghai; the University of Pennsylvania Stuart Weitzman School of Design, and Royal Melbourne Institute of technology before joining Taubman College of Architecture and Urban Planning at the University of Michigan.

She began her training at the Federal Higher Technical Institute for Educating and Experimenting in Building and Construction in Graz, Austria, where she graduated as an engineer at age 19. She received a Master of Science in Architecture from the Technical University in Vienna and her PhD from the Royal Melbourne Institute of Technology.

**Alexandra Carlson**

Alexandra Carlson is a PhD Student in the University of Michigan Robotics Institute. Her graduate research focuses on robust computer vision for autonomous vehicles, specifically on realistic visual feature modeling in images to improve detection and segmentation algorithm performance. She has served as a graduate student mentor for the Taubman AI+Architecture Master's thesis studio for the past two years and has collaborated on numerous architecture projects that involve modeling style in both images and 3D models. She has a BA in psychology from the University of Chicago, where she performed research in both computational neuroscience and physics.