

Generative Design in der Praxis

Lejla Secerbegovic

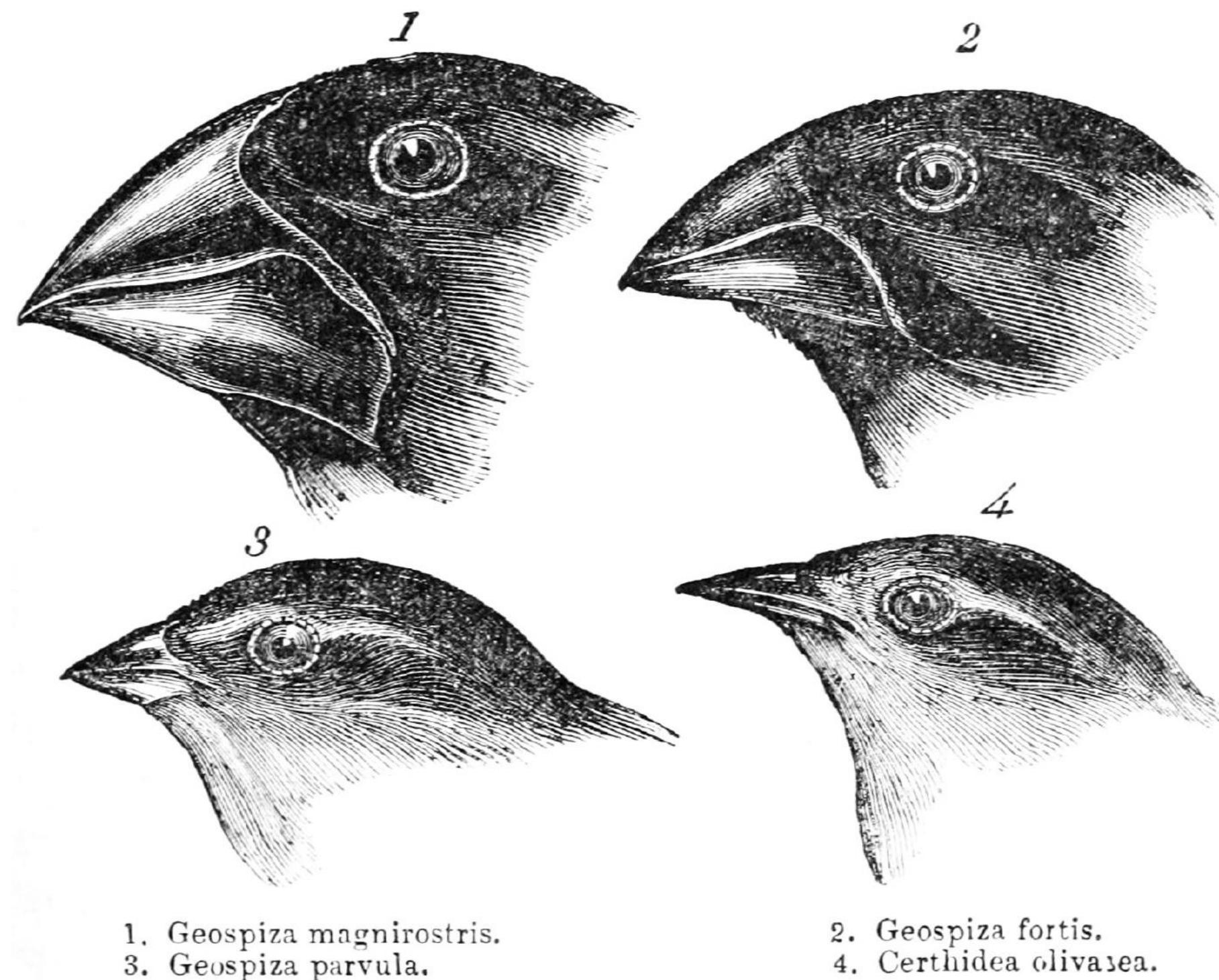
Technical Specialist BIM



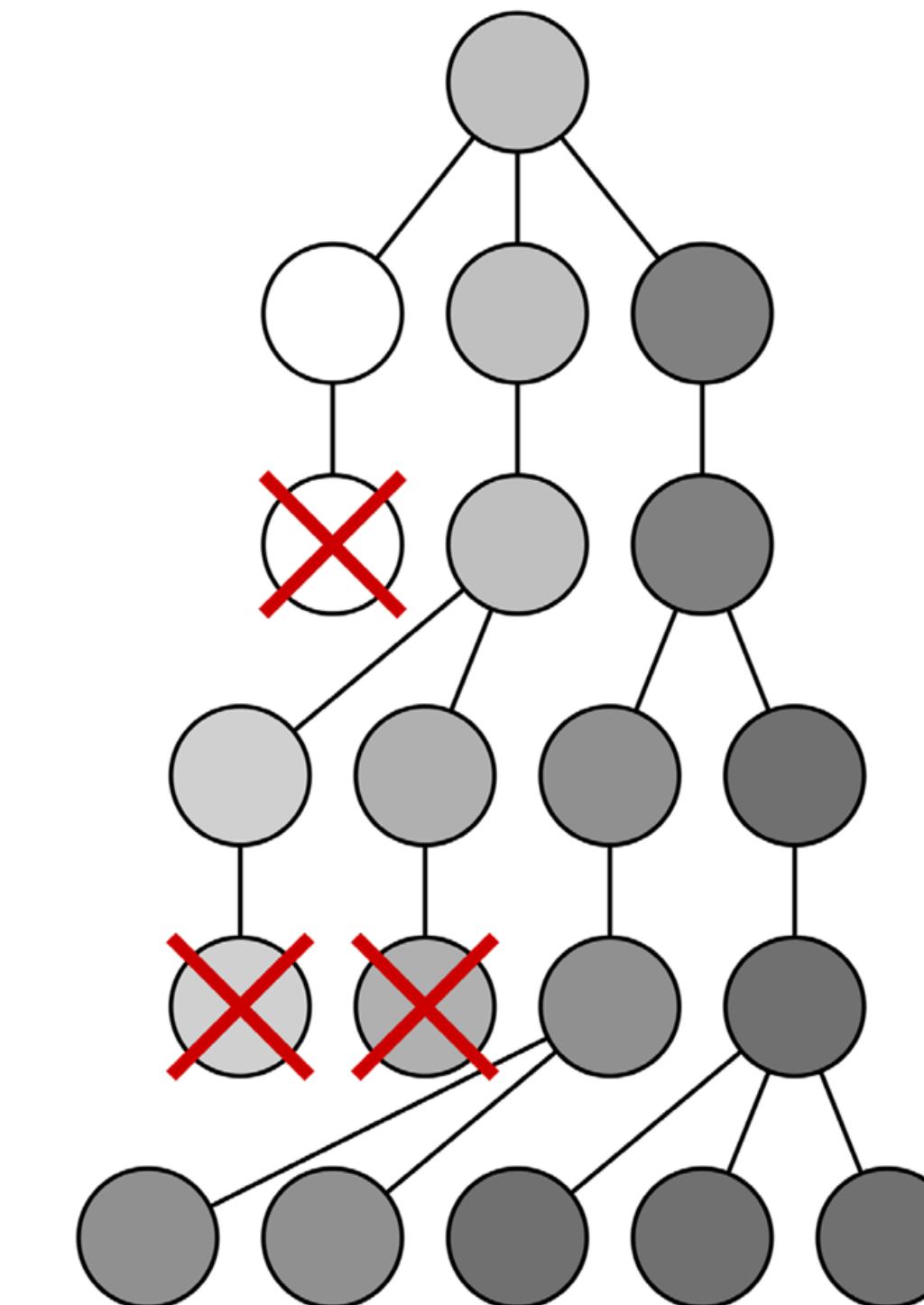
Lejla Secerbegovic

- | | |
|-------------|--|
| 2006 | Architekturdiplom an der TU WIEN |
| 2006 - 2012 | Mitarbeit in diversen Architekturbüros in Wien, Köln und Aachen, alle LPh
Start des Blogs https://BIM-me-up.com |
| 2012 – 2015 | BIM und Revit Spezialistin bei Max Bögl |
| Seit 2015 | Technical Specialist bei Autodesk
Schwerpunkte: Revit, Dynamo, openBIM |

Was ist Generative Design?



Natürliche Evolution



Generative Design Algorithmus

Mutation resultiert
in Variation

Exemplare werden nach best.
Kriterien aussortiert

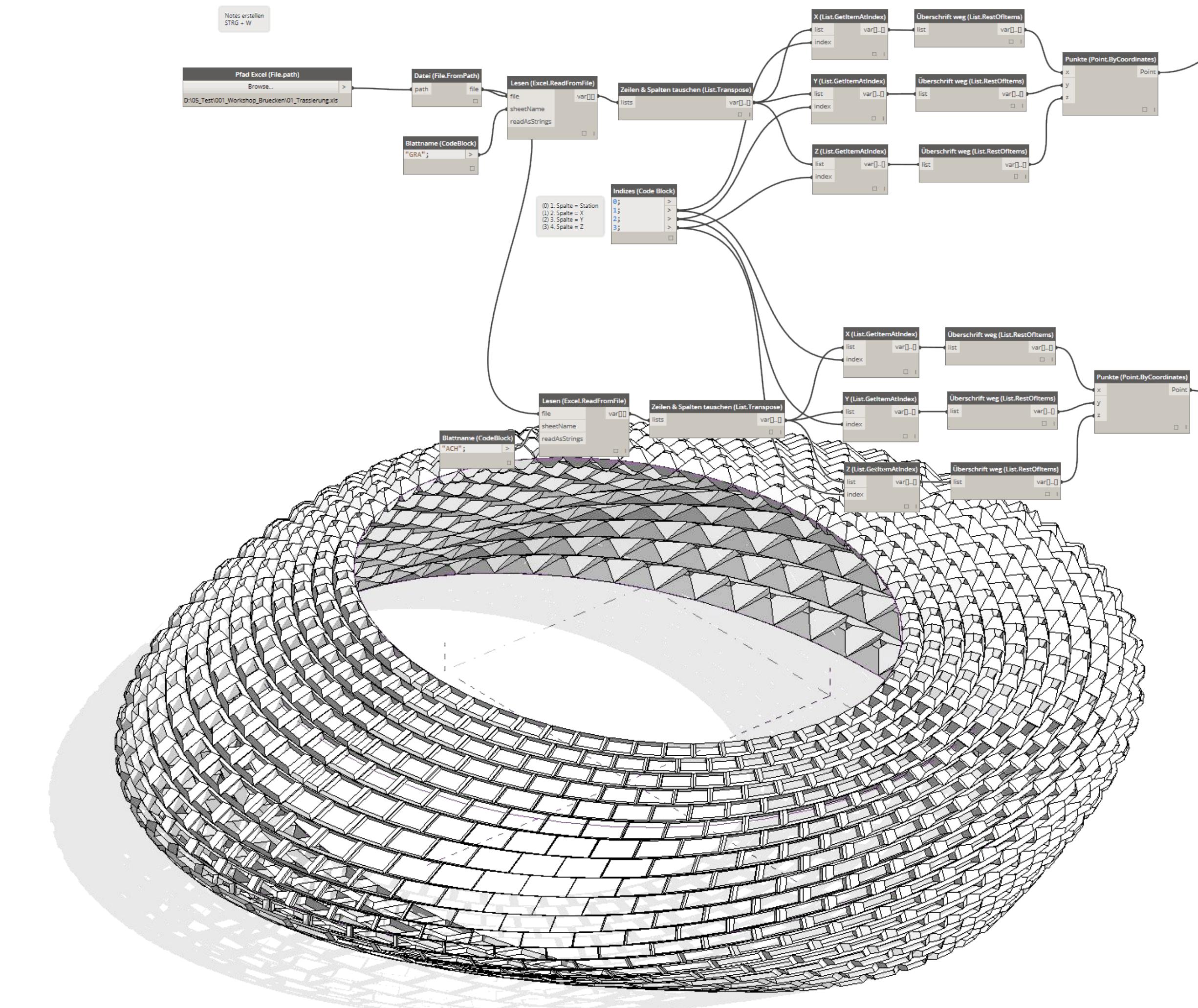
Weitere Fortpflanzung
und Mutation

Erneute Aussortierung

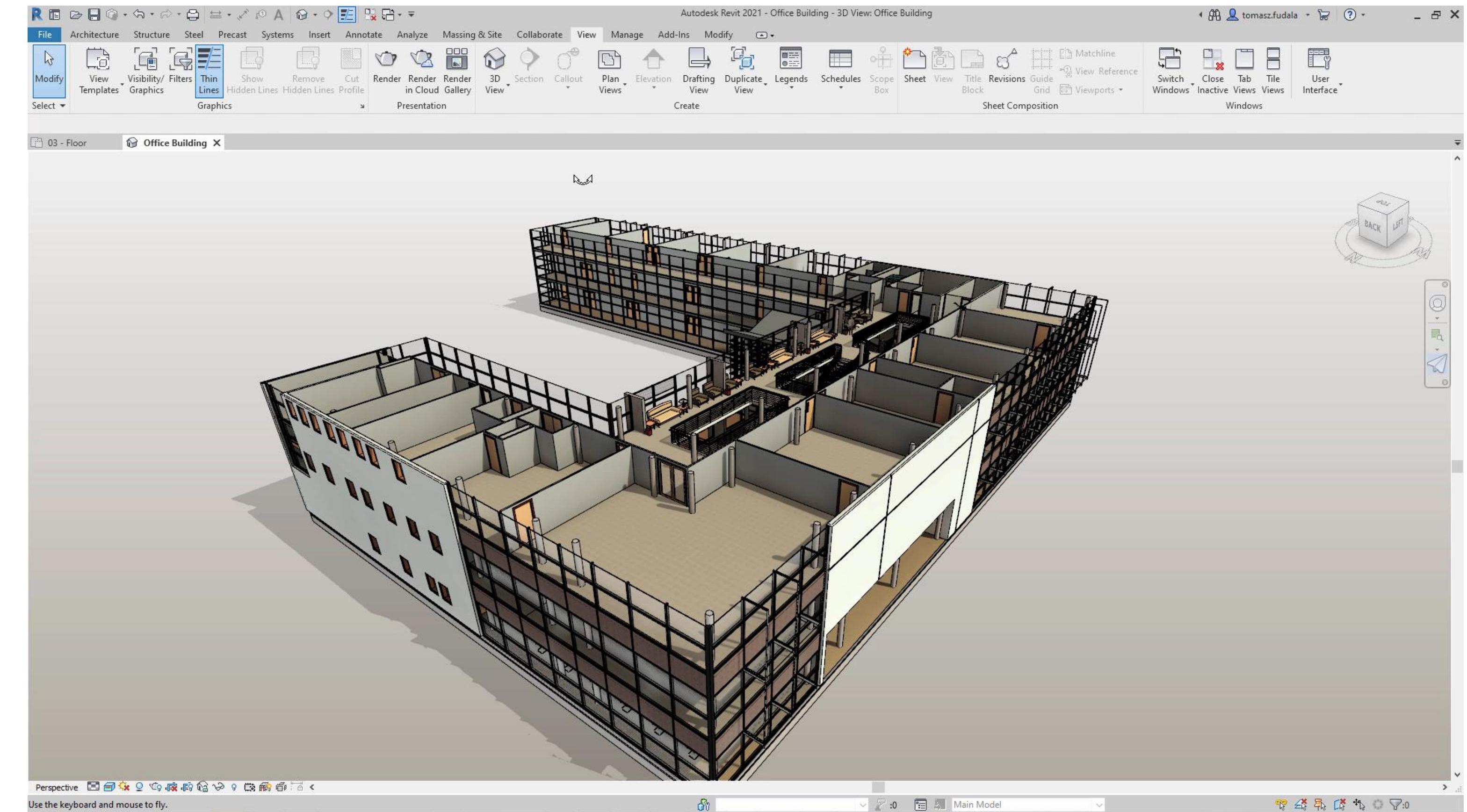
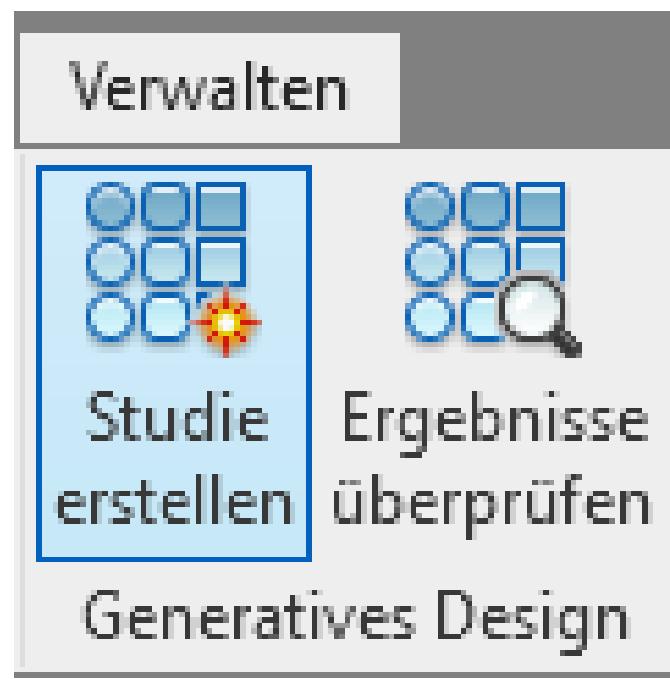
.usw

Dynamo als Basis für Generative Design in Revit

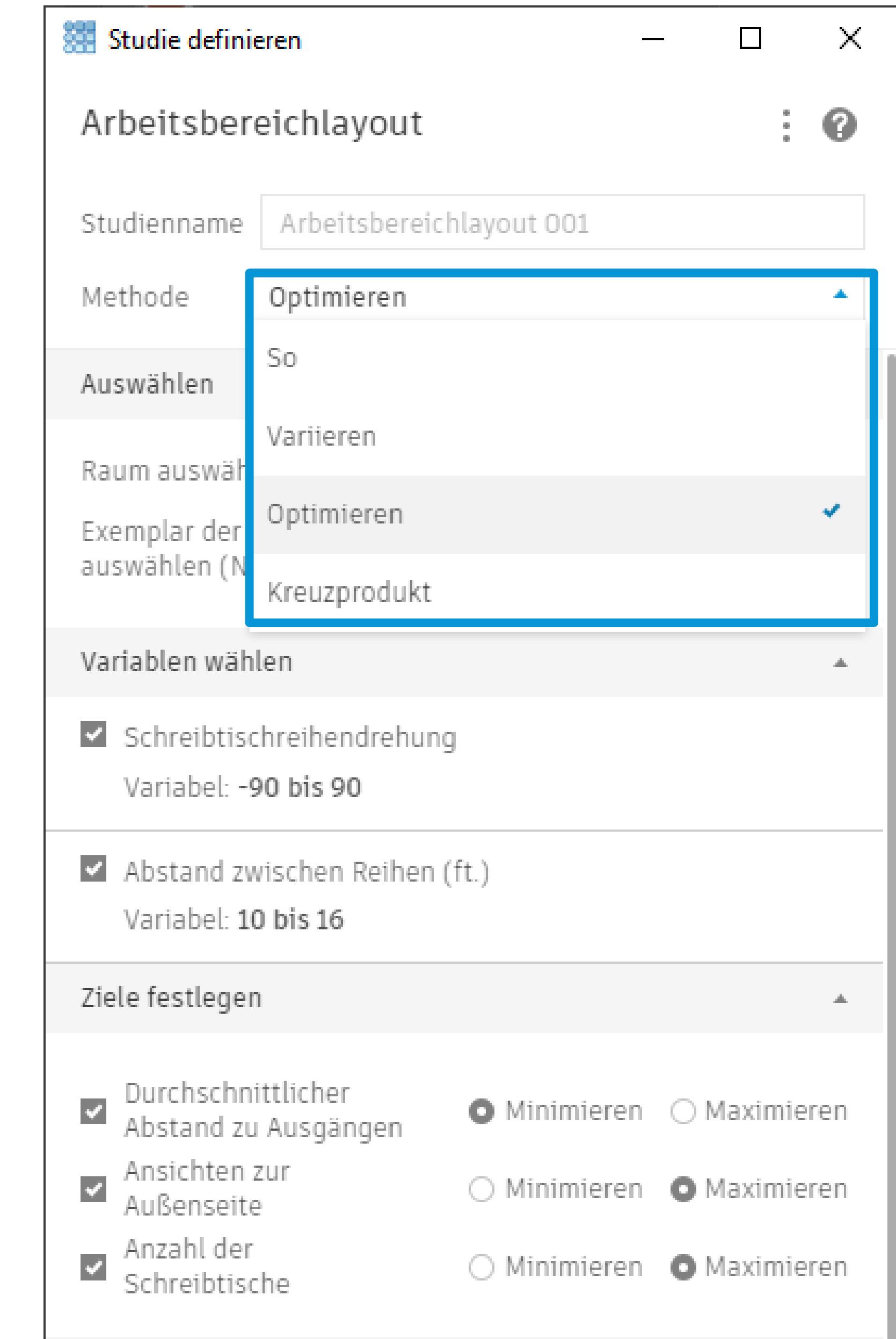
- Computerbasiertes Entwerfen mit direkter Anbindung an Revit
- Zugriff auf alle Daten in Revit, inklusive Import/Export Möglichkeiten
- Automatisierung durch Zugriff auf die Revit Programmierschnittstelle
- Basis für Generative Design in Revit



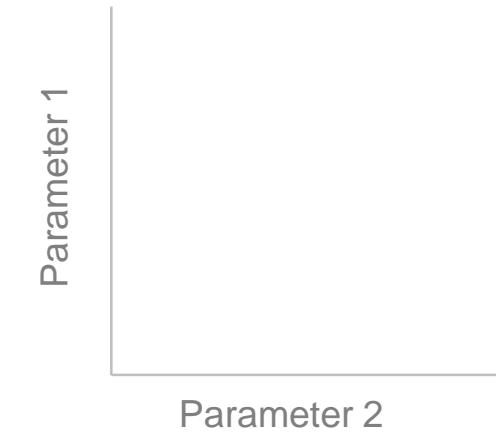
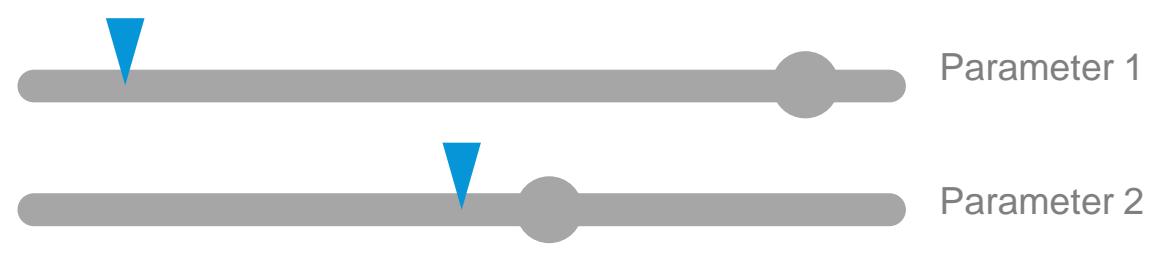
Beispielstudien in Revit 2021



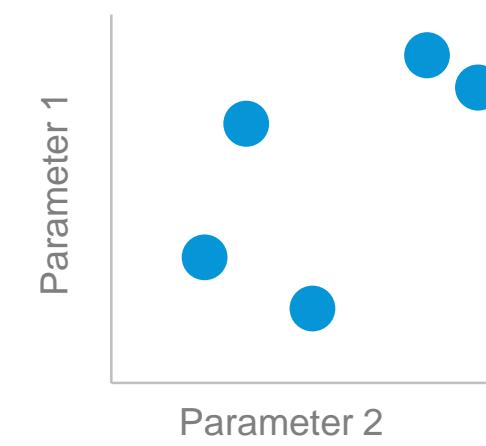
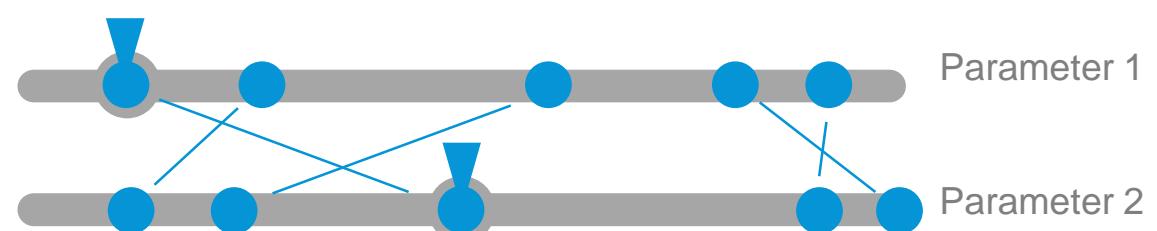
Methoden



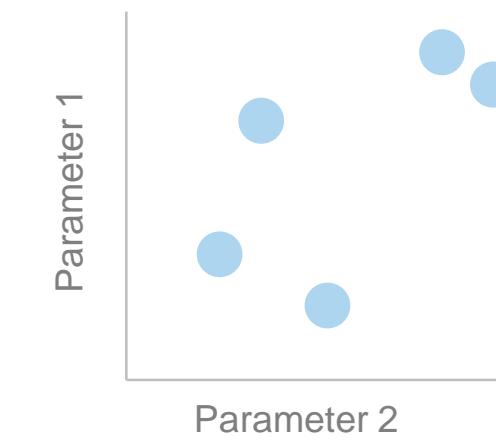
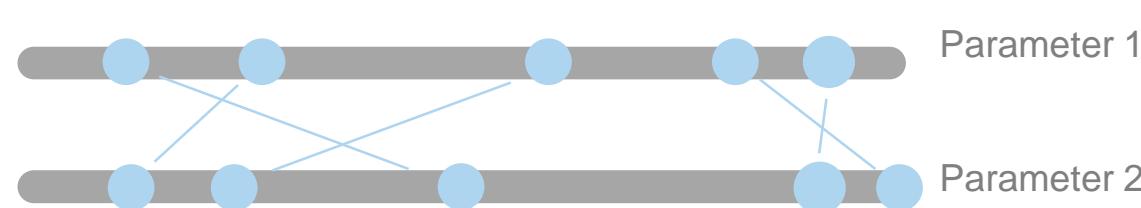
VARIEREN (RANDOMIZE)



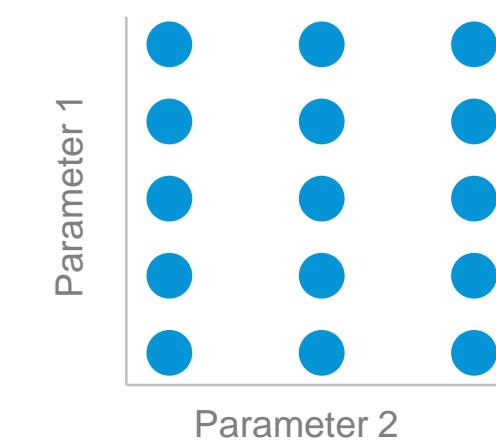
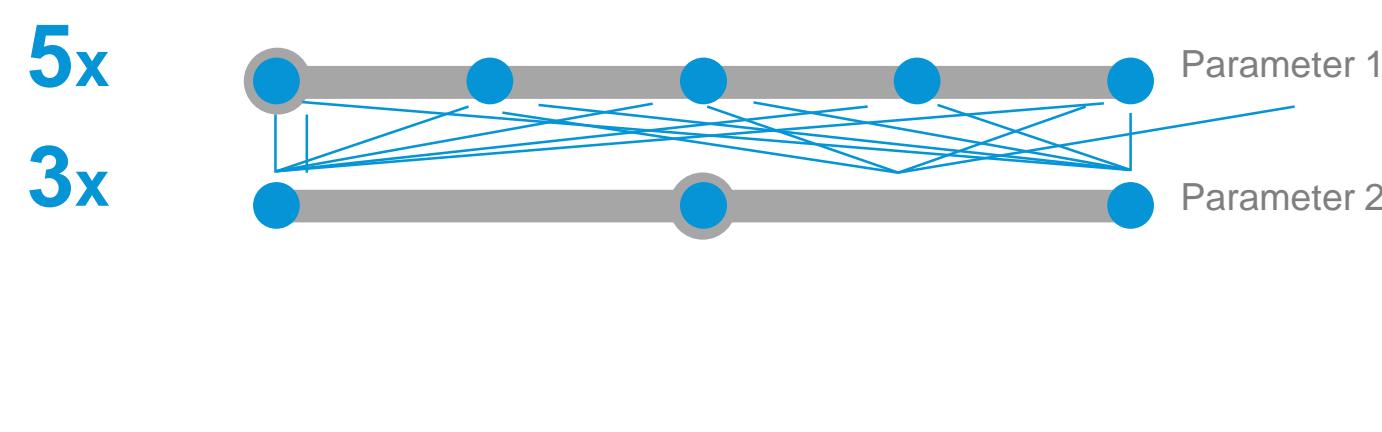
VARIEREN (RANDOMIZE)



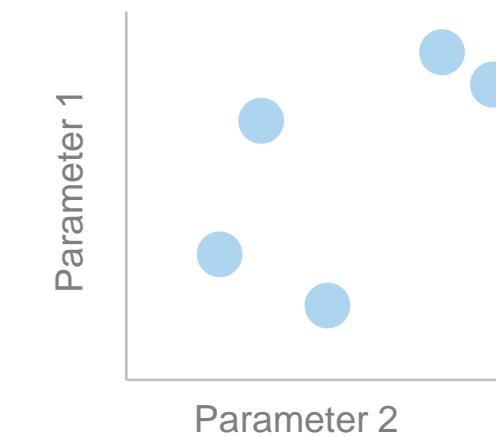
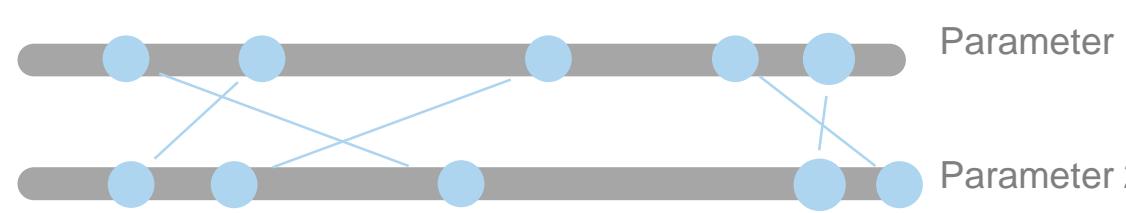
VARIIEREN (RANDOMIZE)



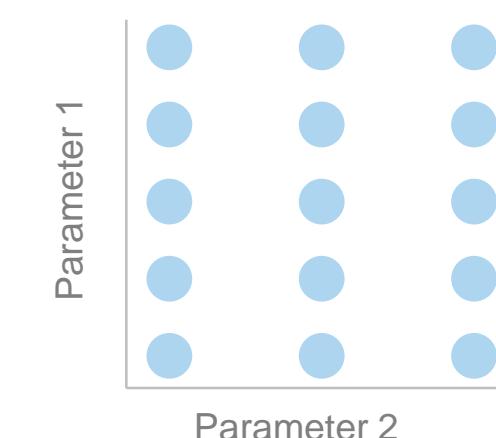
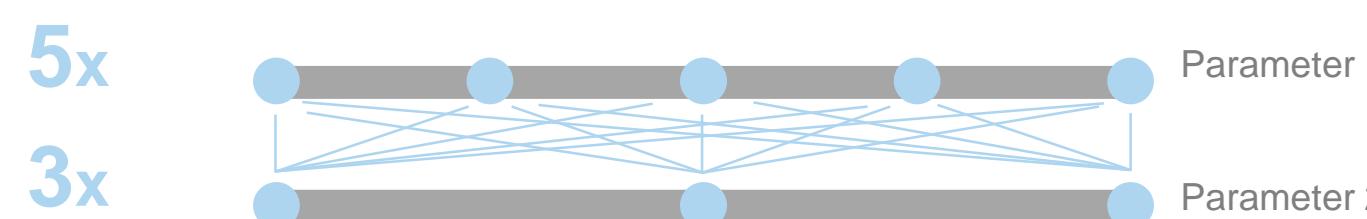
KREUZPRODUKT (CROSS PRODUCT)



VARIIEREN (RANDOMIZE)

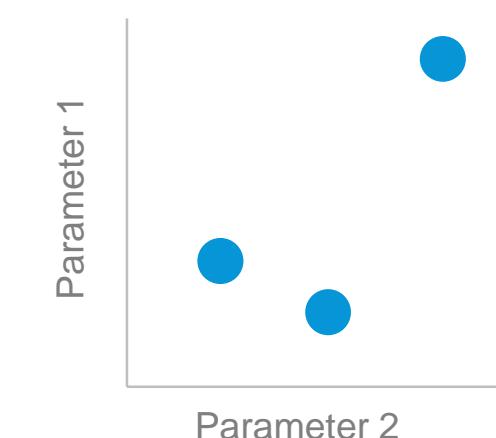
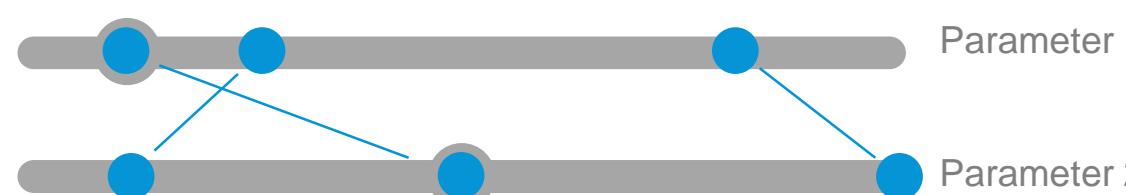


KREUZPRODUKT (CROSS PRODUCT)

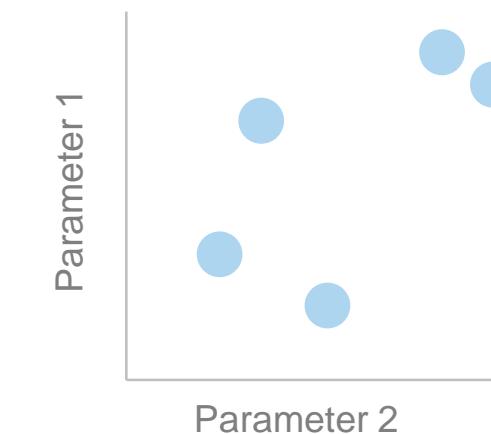
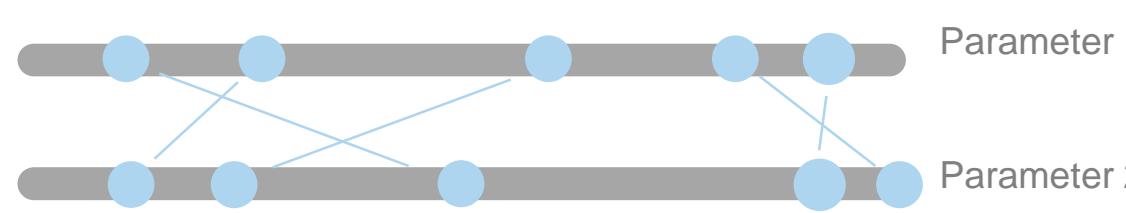


OPTIMIEREN (OPTIMIZE)

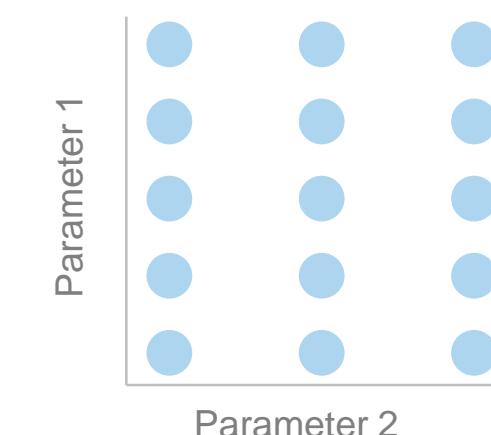
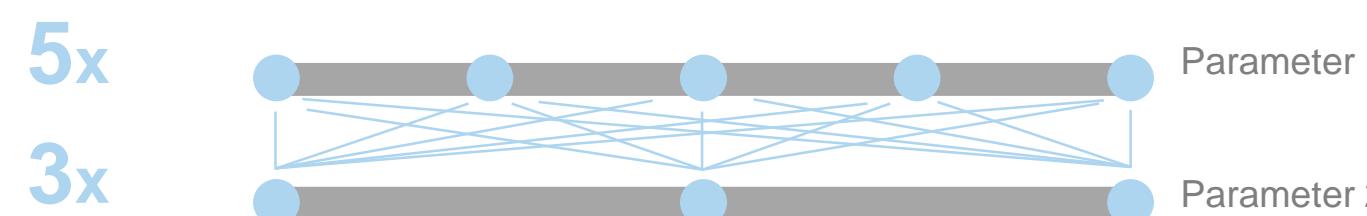
generation 1 population of 3



VARIIEREN (RANDOMIZE)

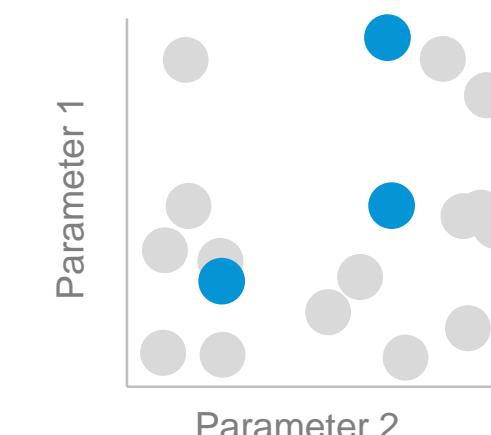
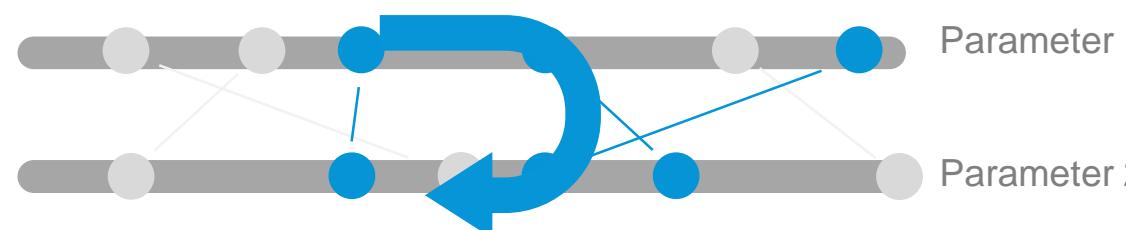


KREUZPRODUKT (CROSS PRODUCT)

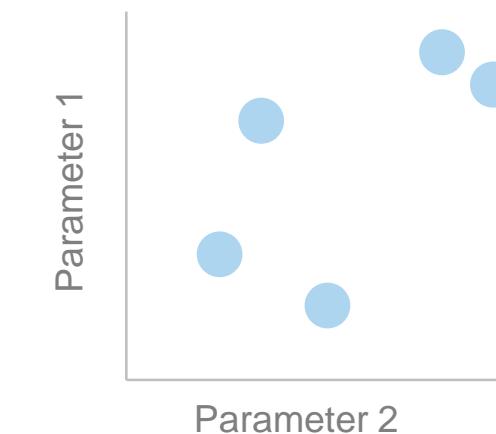
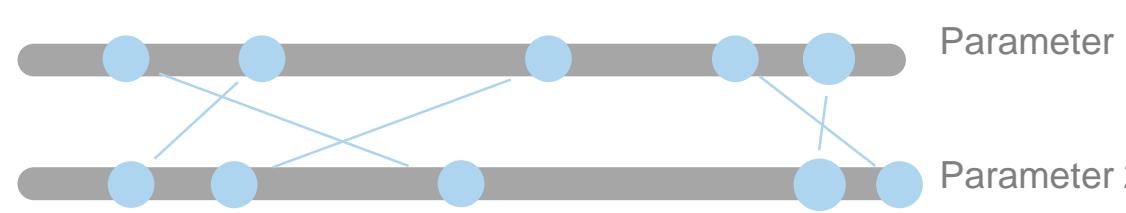


OPTIMIEREN (OPTIMIZE)

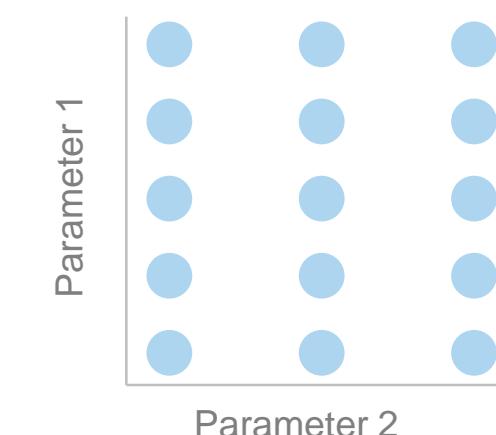
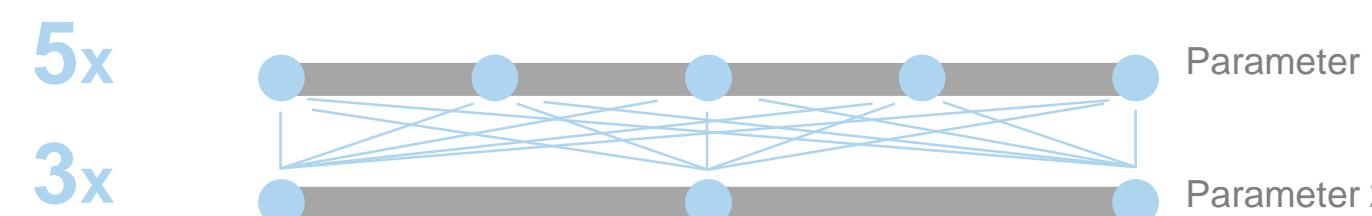
generation 1 population of 3
generation 2 population of 3
...
generation 6 population of 3



VARIIEREN (RANDOMIZE)

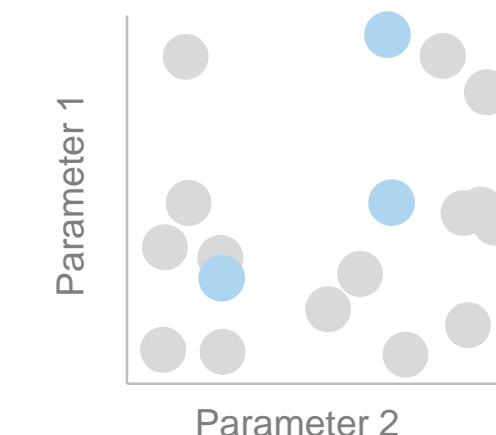
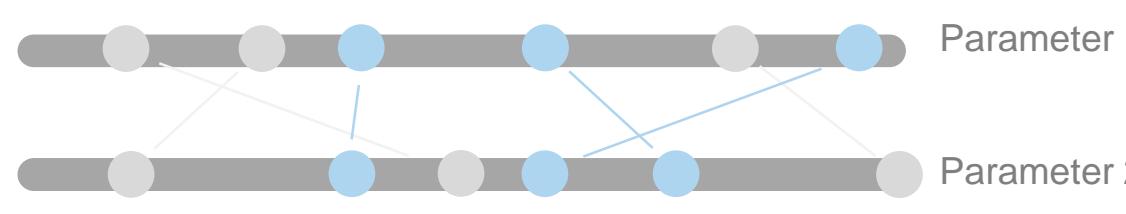


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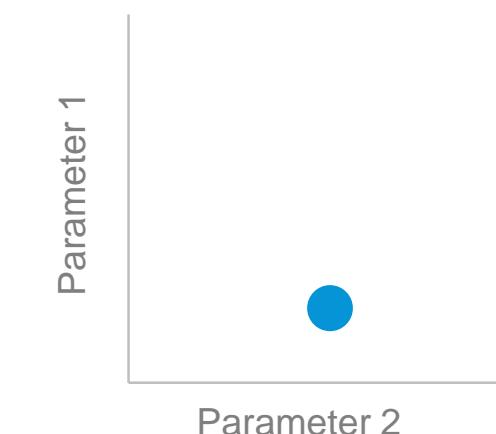
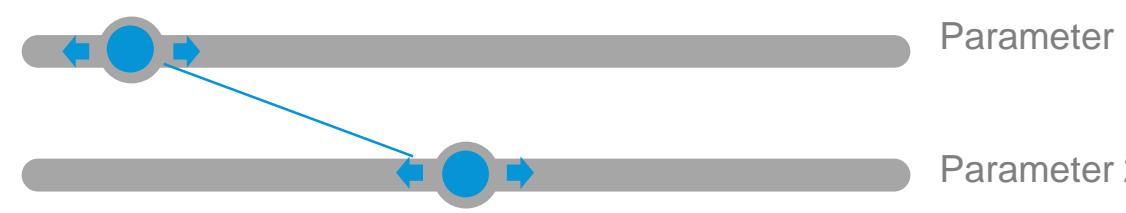


OPTIMIEREN (OPTIMIZE)

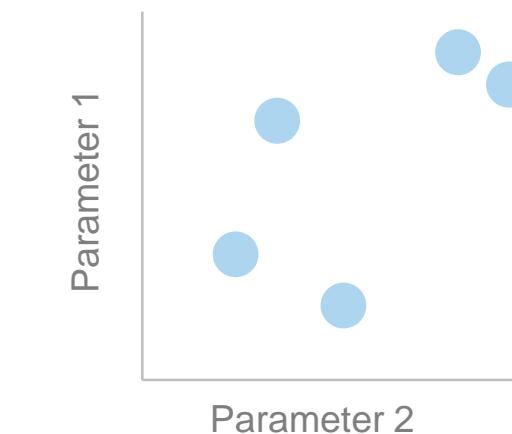
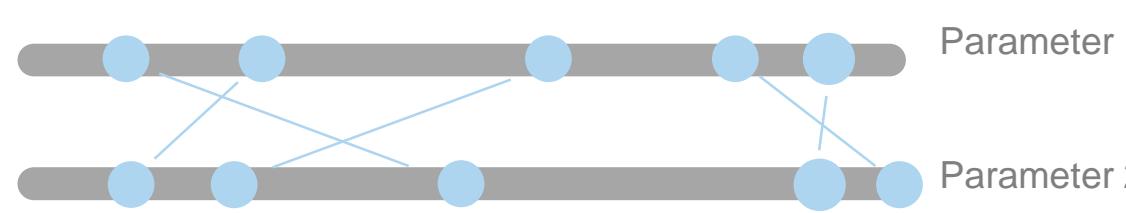
generation 1 population of 3
generation 2 population of 3
...
generation 6 population of 3



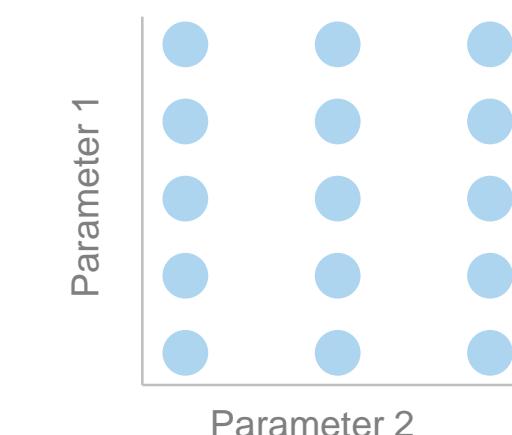
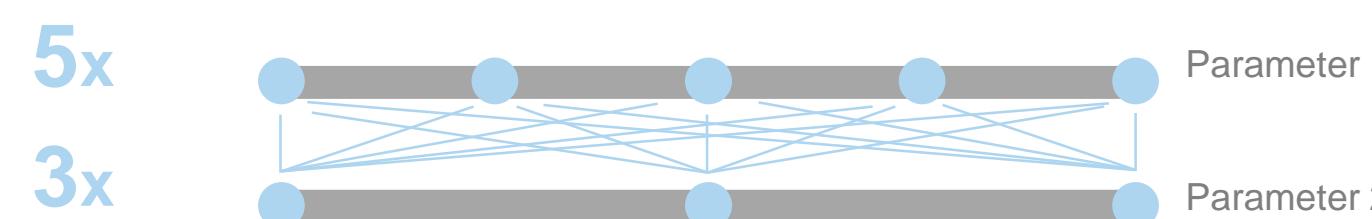
SO (LIKE THIS)



VARIIEREN (RANDOMIZE)

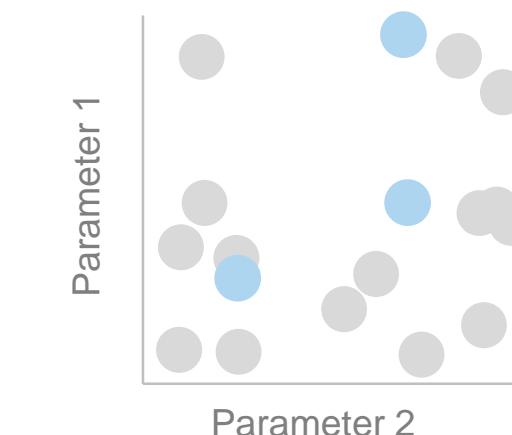
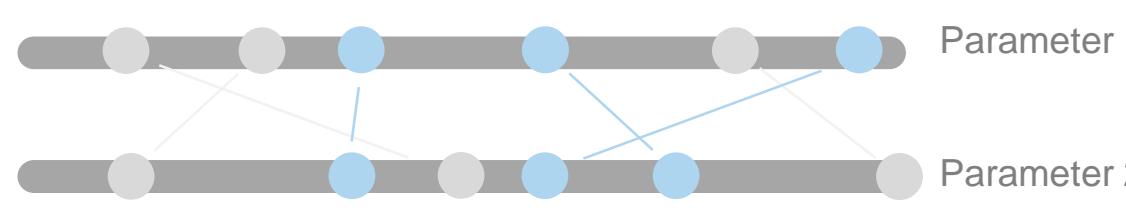


KREUZPRODUKT (CROSS PRODUCT)

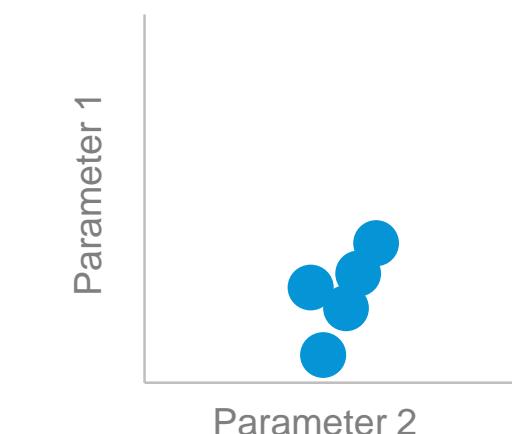
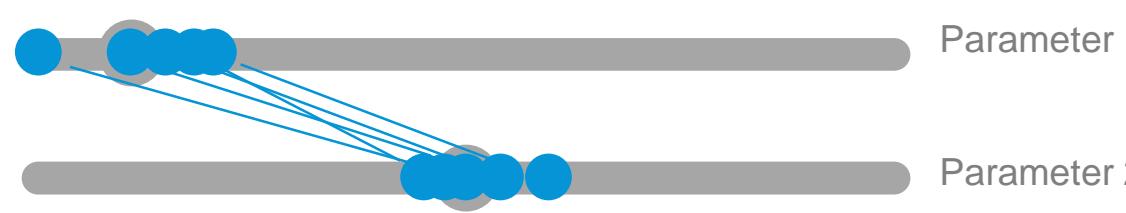


OPTIMIEREN (OPTIMIZE)

generation 1 population of 3
generation 2 population of 3
...
generation 6 population of 3



SO (LIKE THIS)





Search this class

Overview

Video
44 min 47 sec

Presentation
42 slides

Downloads
1 file

Generative Design für AEC

Lejla Secerbegovic

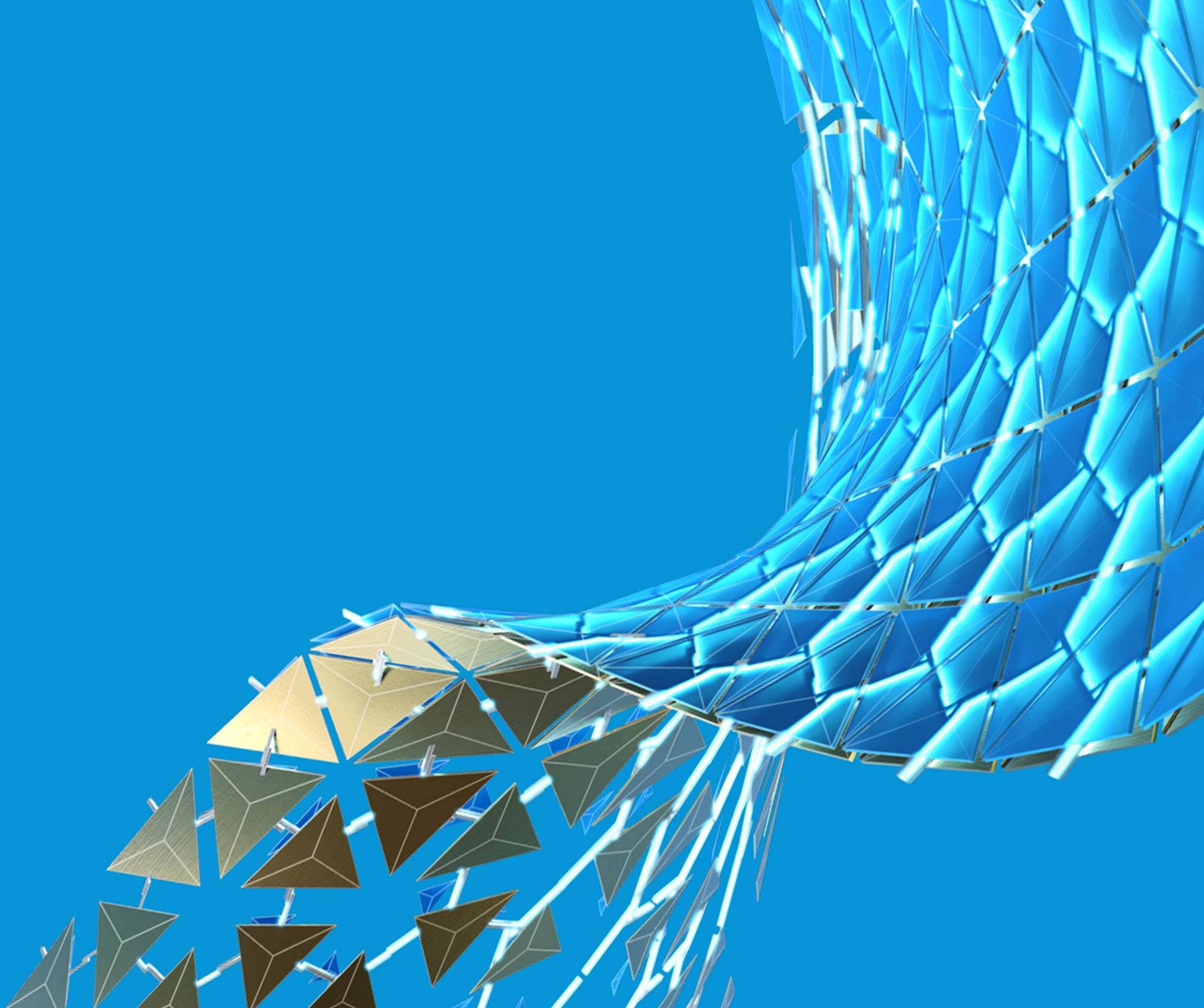
Autodesk

Vortrag Autodesk University 2019

Grundlagen und Beispiele:

<https://www.autodesk.com/autodesk-university/class/Generative-Design-fuer-AEC-2019>

2020



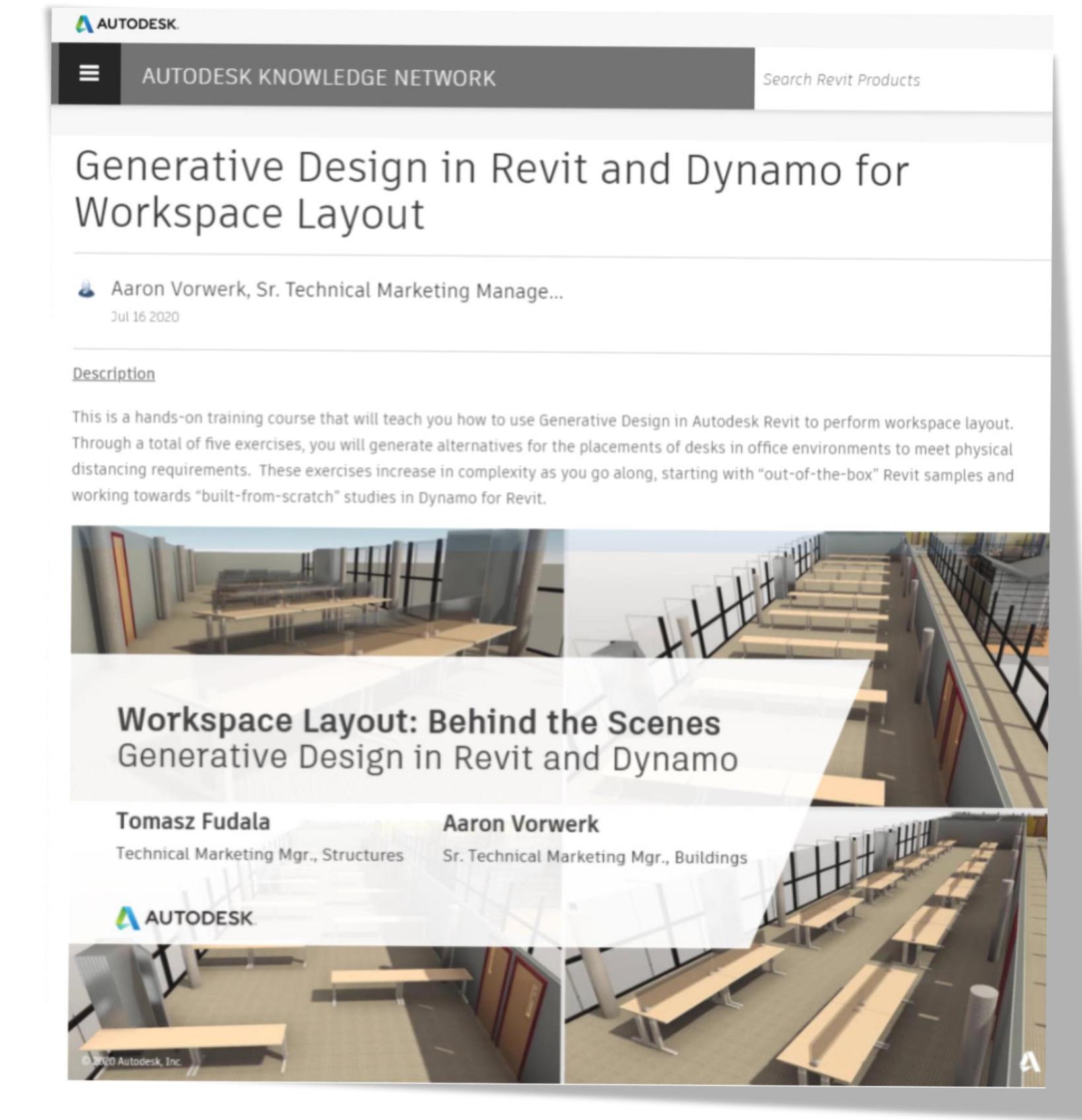
Generative Design als Reaktion auf COVID-19



The screenshot shows a landing page for Autodesk's campaign on returning to the workplace during COVID-19. The main headline reads: "Wir müssen jetzt alle Innovatoren sein. Denn COVID-19 zwingt uns bei Architektur und Bauplanung zum Nachdenken." Below this, a quote from Aaron Vorwerk, Sr. Technical Marketing Manager, discusses the challenges of returning to the office and the role of generative design in meeting physical distancing requirements. The page features several 3D renderings of office layouts with desks and chairs, and a video thumbnail titled "Erleichtern Sie Ihren Kunden die Rückkehr in den Arbeitsalltag".

Designstudie für Büroplanung unter Einhaltung der empfohlenen Mindestabstände

<https://www.autodesk.de/campaigns/aec-return-to-workplace>



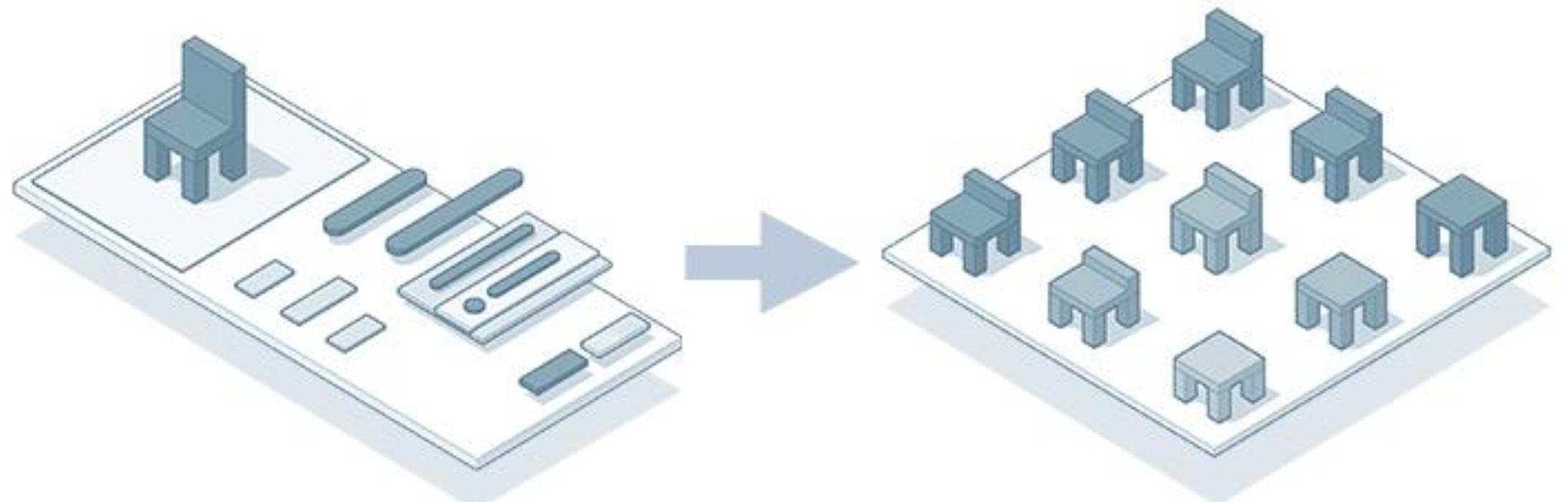
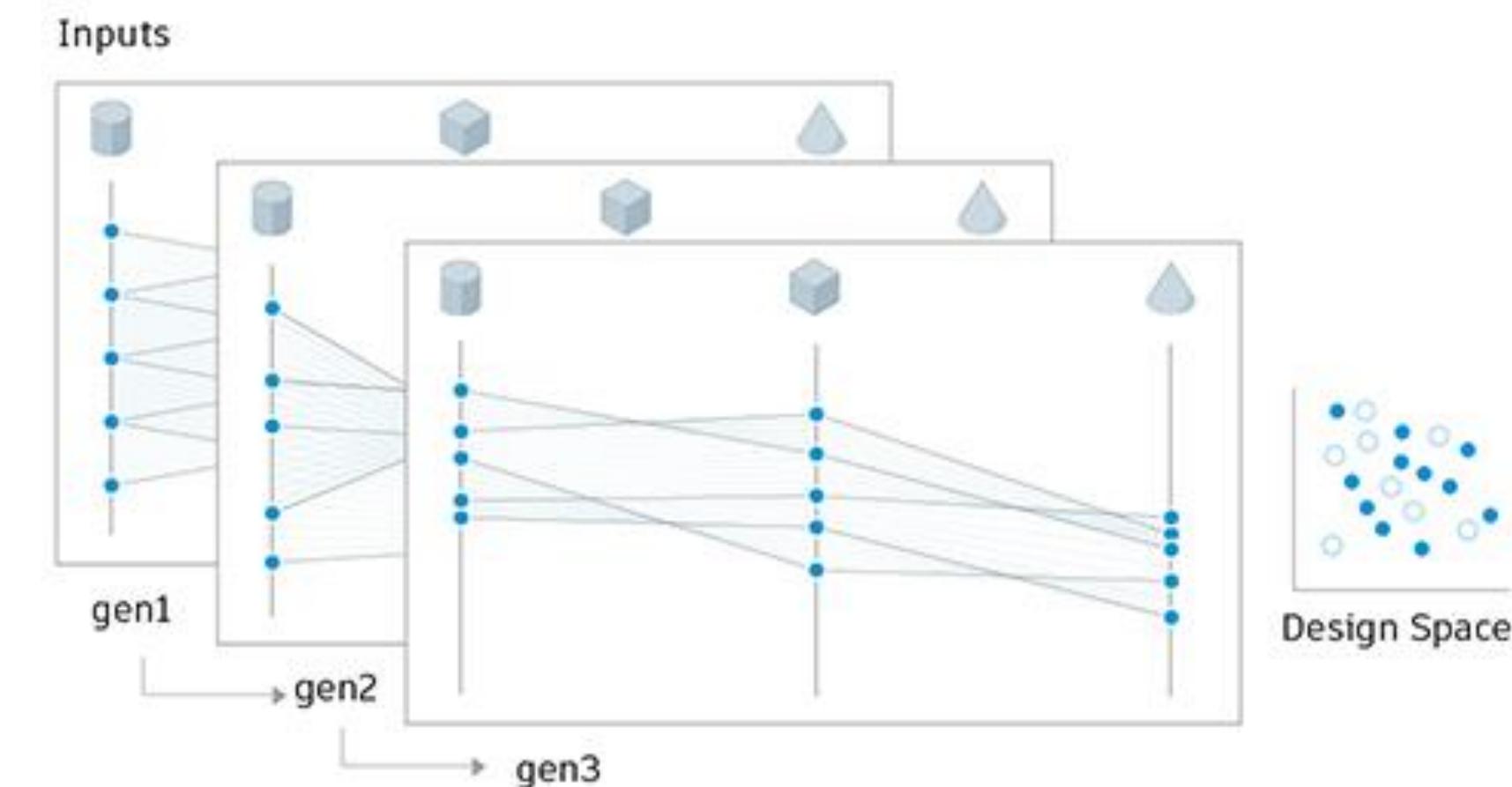
The screenshot shows an article titled "Generative Design in Revit and Dynamo for Workspace Layout" from the Autodesk Knowledge Network. The article is authored by Aaron Vorwerk and published on July 16, 2020. It describes a hands-on training course using Autodesk Revit and Dynamo to perform workspace layout. The page includes a 3D rendering of an office layout with desks and chairs, and a section titled "Workspace Layout: Behind the Scenes Generative Design in Revit and Dynamo". It also lists the authors' names and titles: Tomasz Fudala (Technical Marketing Mgr., Structures) and Aaron Vorwerk (Sr. Technical Marketing Mgr., Buildings).

Ausführliche Trainingsunterlagen (PDF Tutorial und Datensätze, in Englisch)

<https://autode.sk/workspace-layout>

Generative Design in Revit 2021

- Untersucht verschiedene **Entwurfsvarianten**
- Unterstützt bei der **Lösung** komplexer Problemstellungen
- Ermöglicht die **Vorgabe** von Zielen, Konstanten und Variablen
- Verschiedene Ergebnisse inkl. Bewertungskriterien als **Entscheidungshilfe**
- Basierend auf **Dynamo**, unabhängig nutzbar im Rahmen der AEC Collection Lizenz



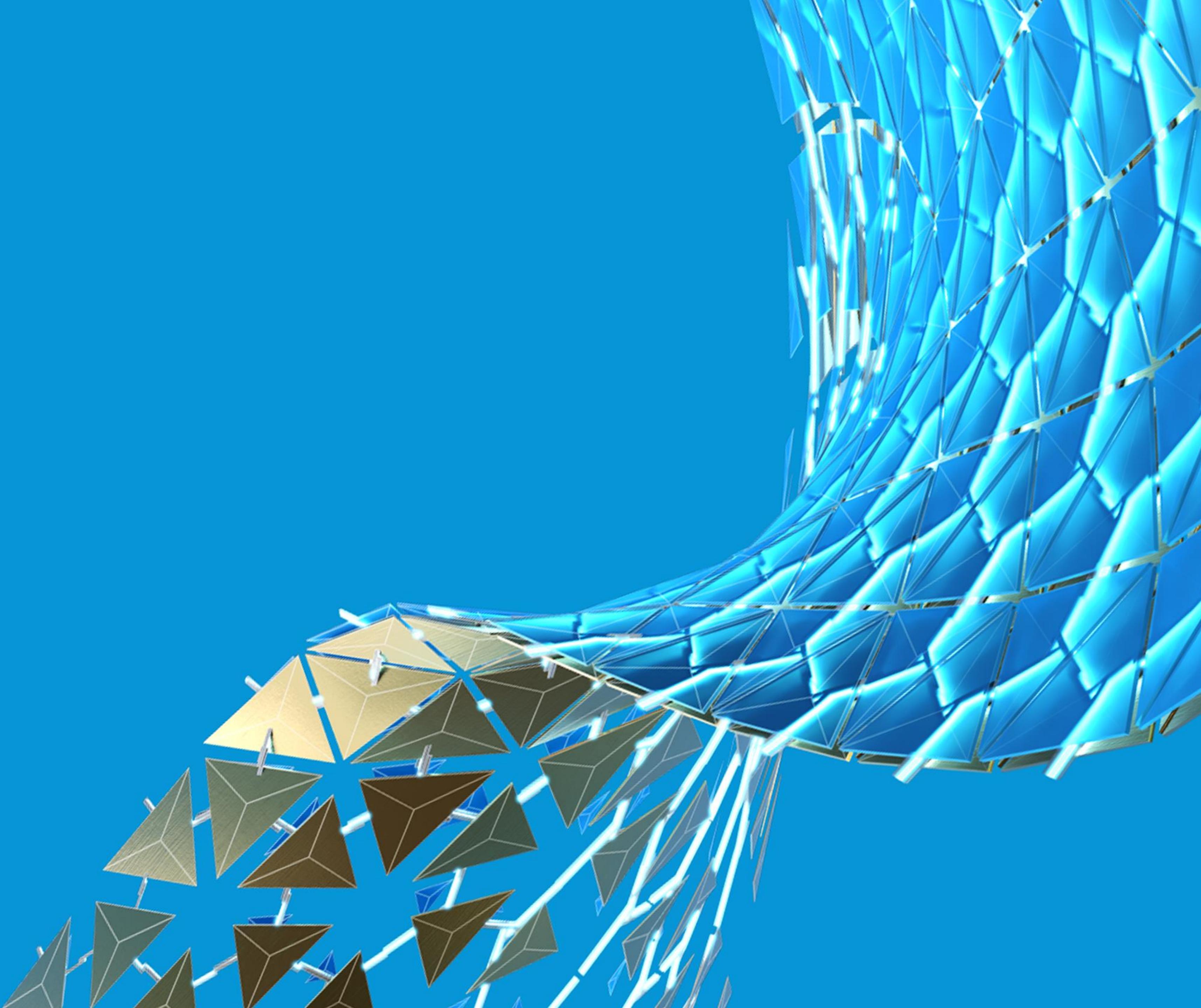
Generative Design Funktionalitäten für ältere Revit Versionen erhalten Sie über Project Refinery:

<https://www.autodesk.com/campaigns/refinery-beta>



AUTODESK® REVIT® 2021

DEMO



Übung 1

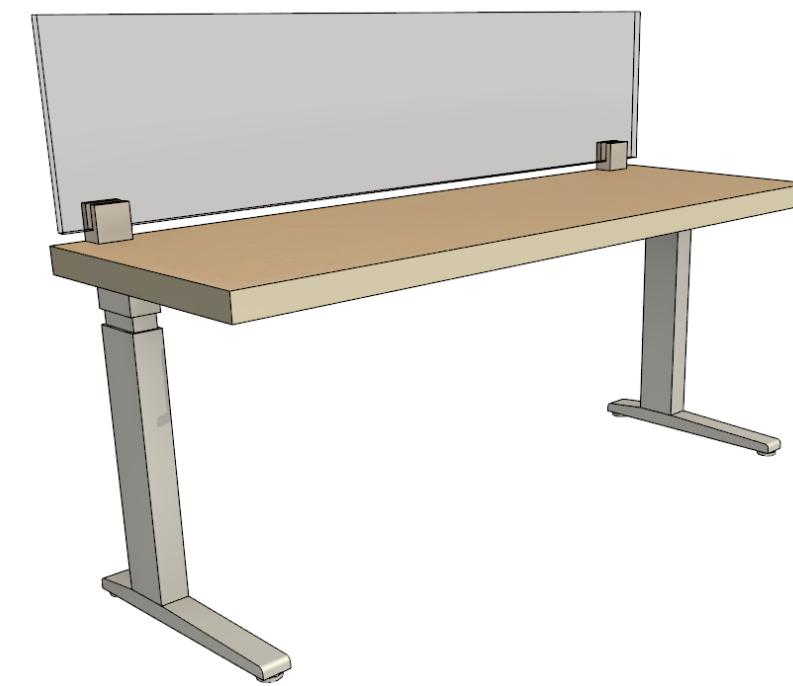
Studie *Arbeitsbereichlayout*

Vorgaben:

- Durchschnittlichen Abstand zu Ausgängen minimieren
- Ansichten zur Außenseite maximieren (berücksichtigt die Sichtbeziehungen)
- Anzahl der Schreibtische maximieren

Übung 2a

Stehschreibtische



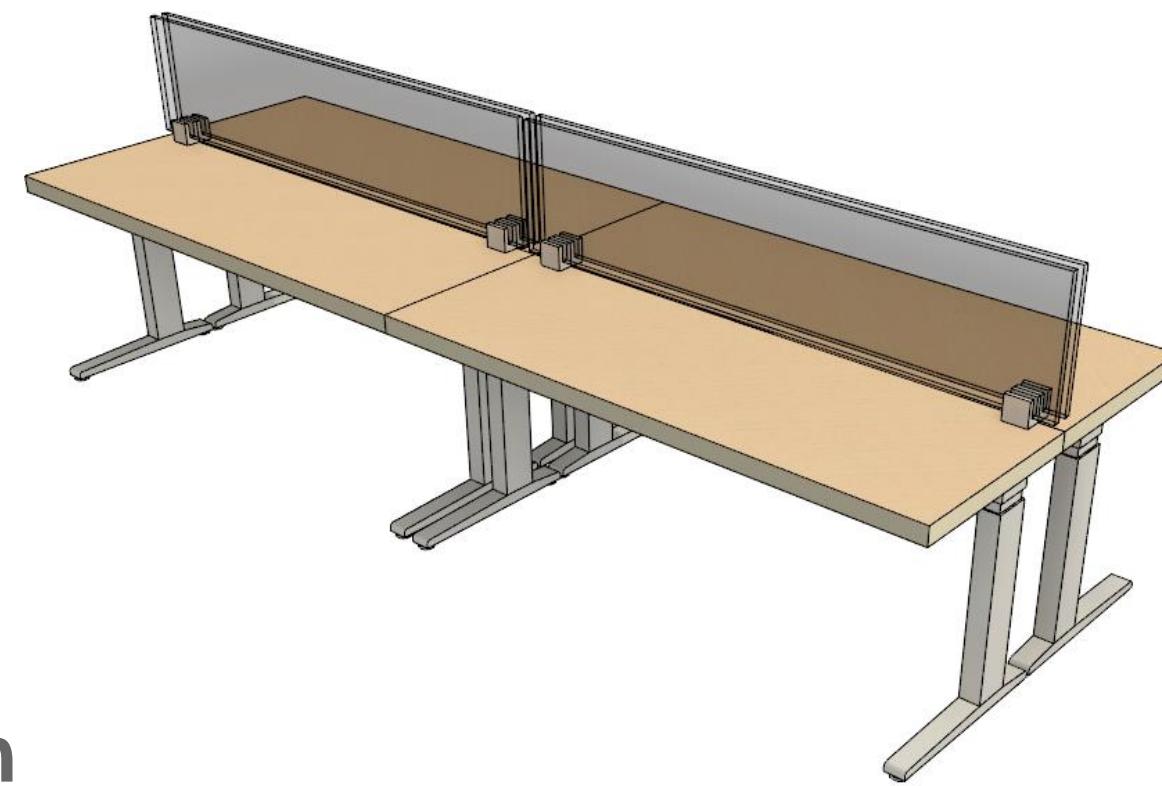
Anforderungen:

- 32 Steharbeitsplätze
- Glaspaneele können genutzt werden, um eine vis-a-vis Platzierung zu ermöglichen
- Idealerweise sollten die zwei existierenden mobilen Trennwände nutzbar bleiben



Übung 2b

Stehschreibtische



Anforderungen:

Stehschreibtische in 4er Gruppen
senkrecht zur Fensterfront

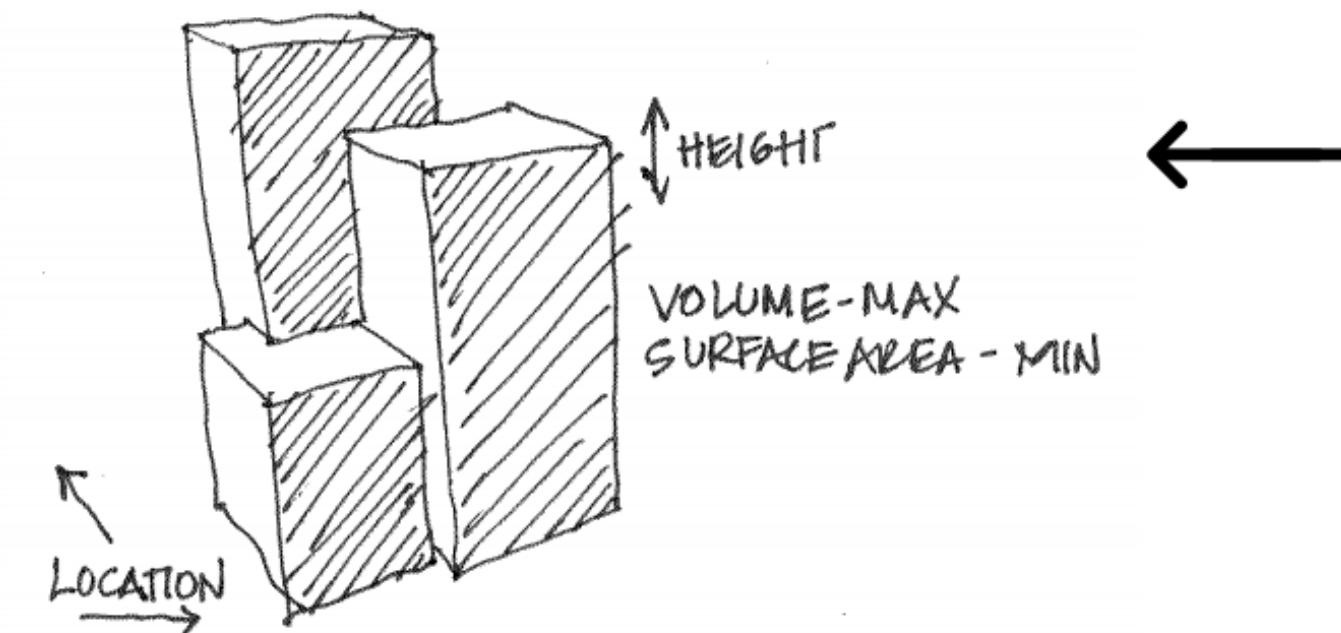


Übung 2c – Eigene Studie

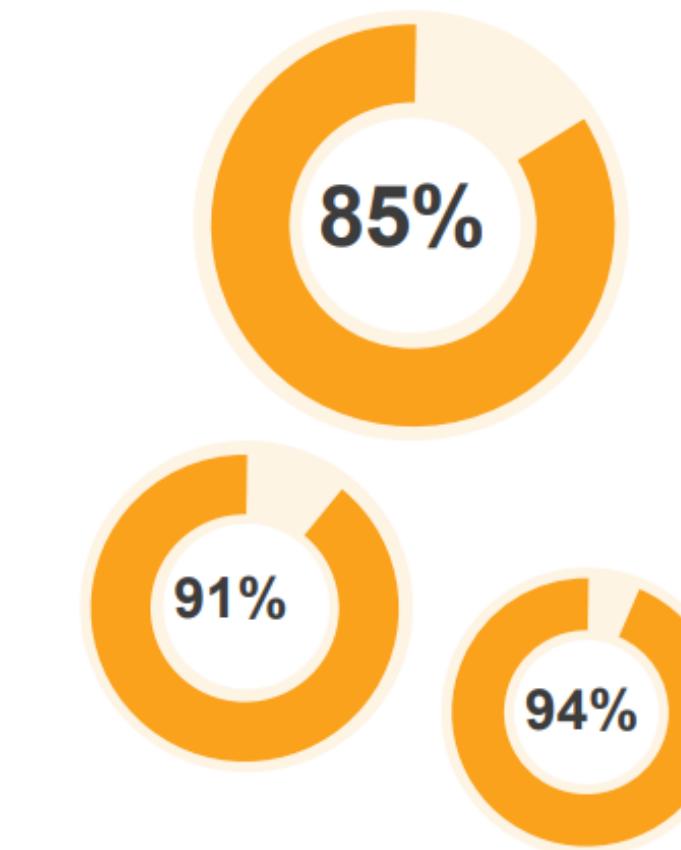
Sichtbare Parameter / Eingaben



Berechnungen



Ziele / Messwerte



- Entfernung von Tischen zur Wand in X Richtung
- Entfernung von Tischen zur Wand in Y Richtung
- Entfernung zwischen Tischen in X Richtung
- Entfernung zwischen Tischen in Y Richtung

- Anzahl von Tischen
- Abstand X Richtung
- Abstand Y Richtung

Weitere online Dokumentation



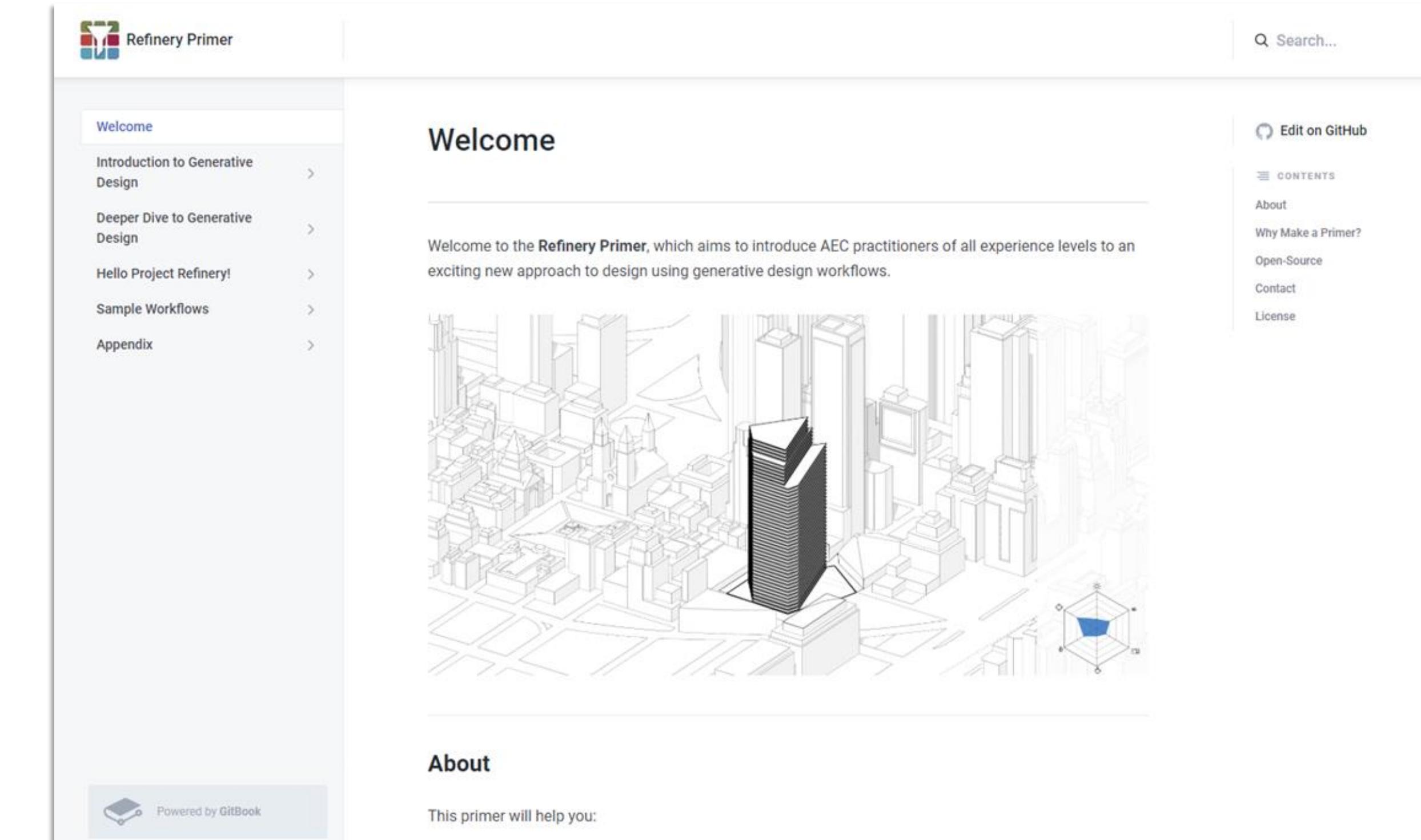
Verbindung zu Revit

Dynamo for Revit ergänzt die Gebäudemodellierung (Building Information Modelling) um die Daten- und Logikumgebung eines grafischen Algorithmeneditors. Die Flexibilität dieser Umgebung eröffnet zusammen mit einer robusten Revit-Datenbank neue Perspektiven für BIM.

Dieses Kapitel behandelt die Dynamo-Arbeitsabläufe für BIM. Die einzelnen Abschnitte enthalten im Wesentlichen Übungen, da sich ein grafischer Algorithmeneditor für BIM am besten anhand konkreter Projekte vorstellen lässt. Zunächst erhalten Sie hier jedoch eine Einführung in die Ursprünge dieses Programms.

#

- 5.3. Points
- 5.4. Kurven
- 5.5. DGMs
- 5.6. Festkörper
- 5.7. Netze
- 5.8. Importieren von Geometrie
- 6. Entwerfen mit Listen
 - 6.1. Was ist eine Liste?
 - 6.2. Arbeiten mit Listen
 - 6.3. Listen von Listen
 - 6.4. n-dimensionale Listen
- 7. Codeblöcke und DesignScript
 - 7.1. Was ist ein Codeblock?
 - 7.2. DesignScript-Syntax
 - 7.3. Kurzschreibweisen
- 7.4. Funktionen
- 8. Dynamo for Revit
 - 8.1. Verbindung zu Revit
 - 8.2. Auswählen
 - 8.3. Bearbeiten
 - 8.4. Erstellen
 - 8.5. Anpassen
 - 8.6. Dokumentation
- 9. Wörterbücher in Dynamo



Welcome

Welcome to the **Refinery Primer**, which aims to introduce AEC practitioners of all experience levels to an exciting new approach to design using generative design workflows.

Powered by GitBook

- Introduction to Generative Design
- Deeper Dive to Generative Design
- Hello Project Refinery!
- Sample Workflows
- Appendix

CONTENTS

Edit on GitHub

About

Why Make a Primer?

Open-Source

Contact

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<https://primer.dynamobim.org/de/>

<https://www.generativeDesign.org/>



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