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KÜNSTLICHE INTELLIGENZ IN DER BAUWIRTSCHAFT

Simulation & Anwendung mit BIM

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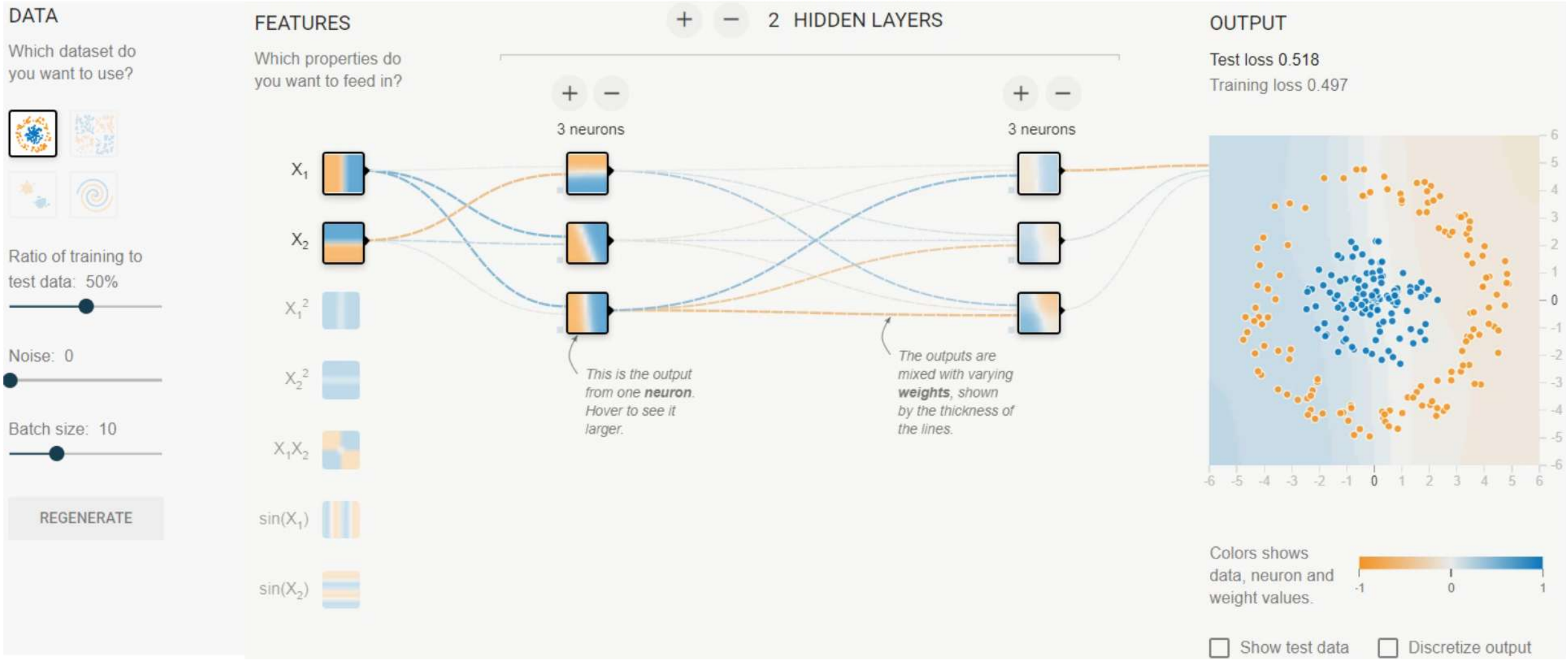
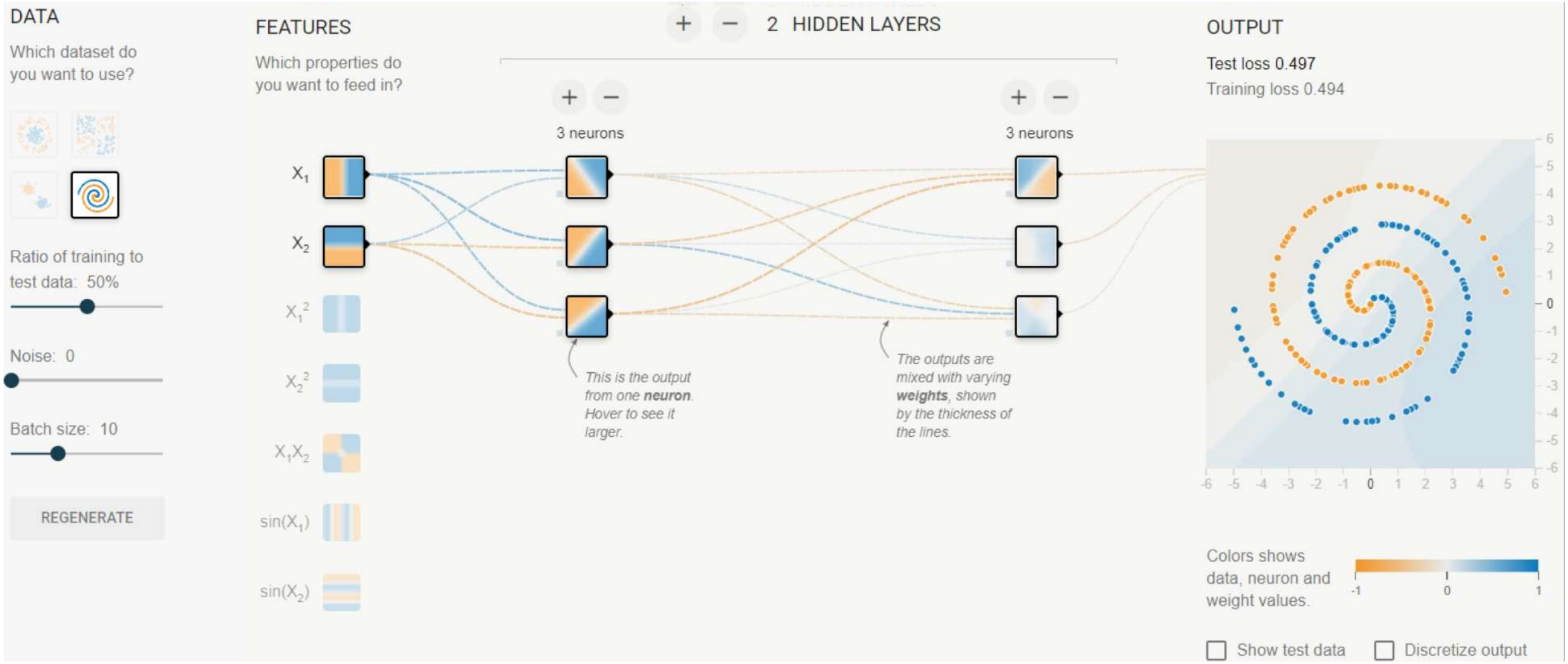
HOW AI WORKS



https://playground.tensorflow.org



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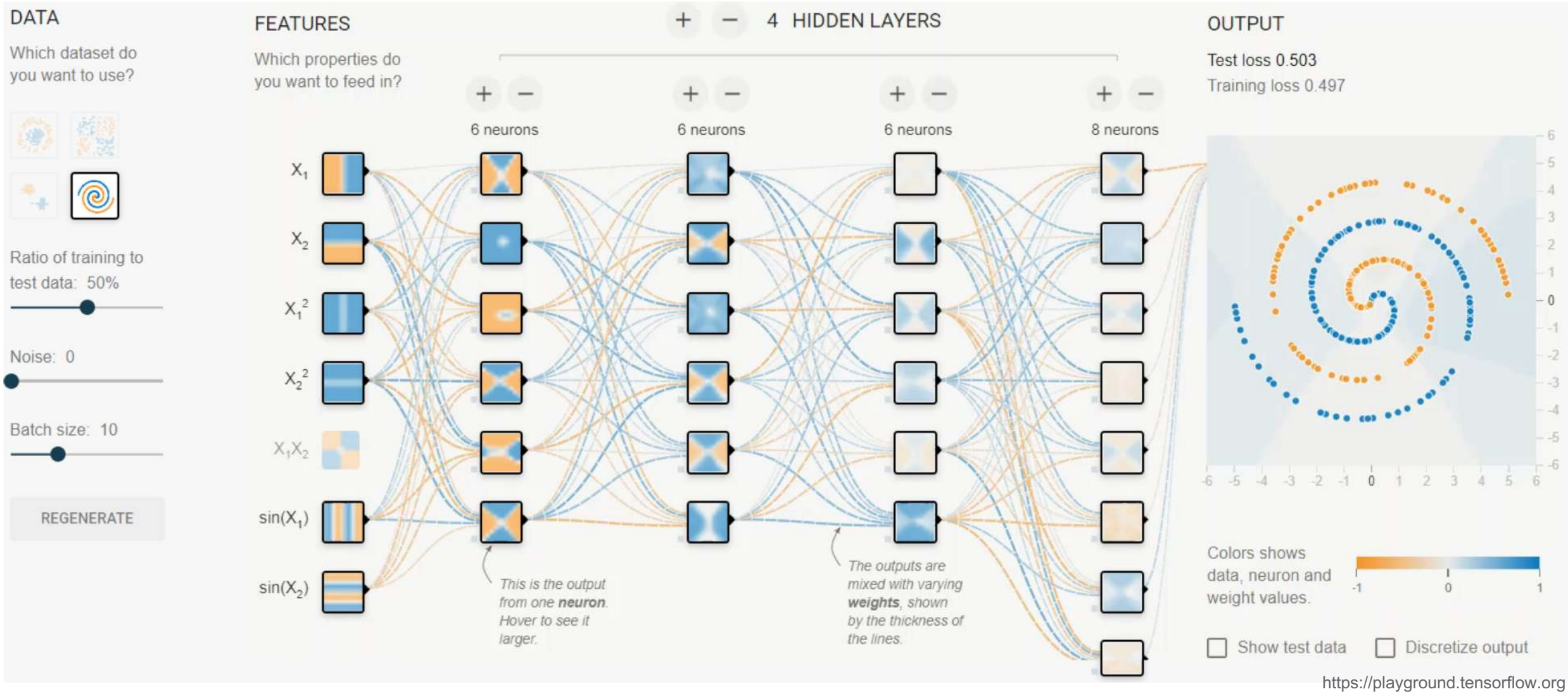
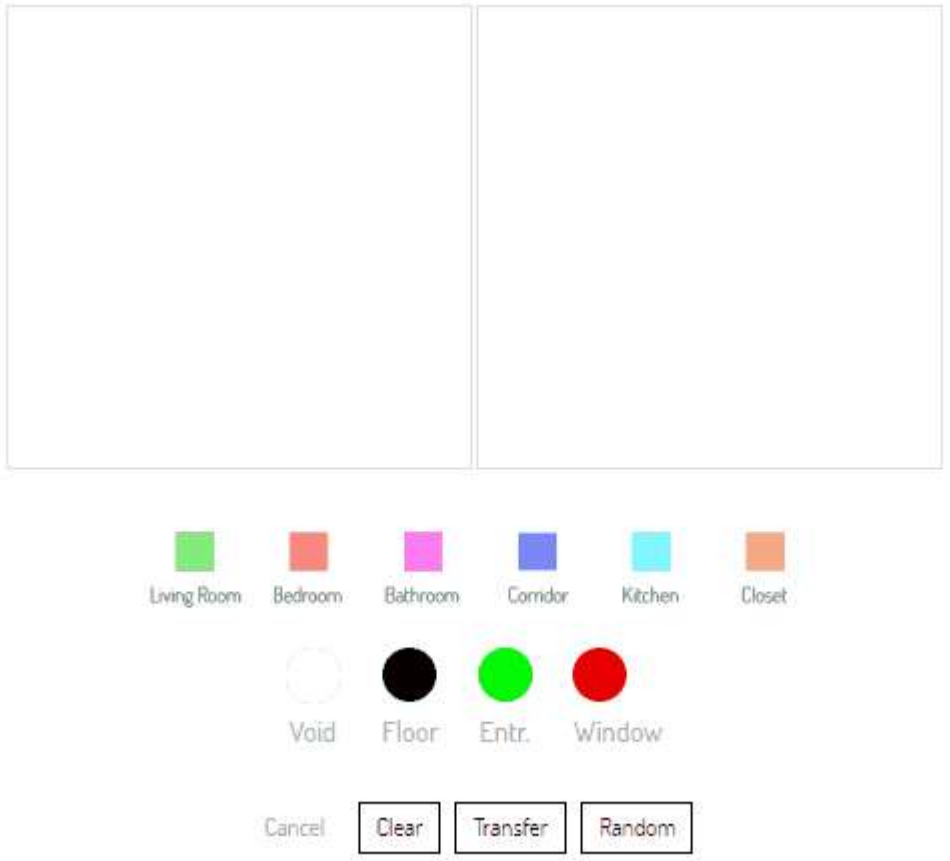


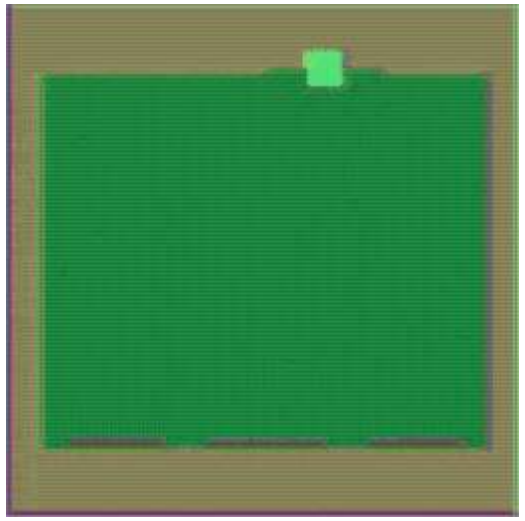
https://playground.tensorflow.org

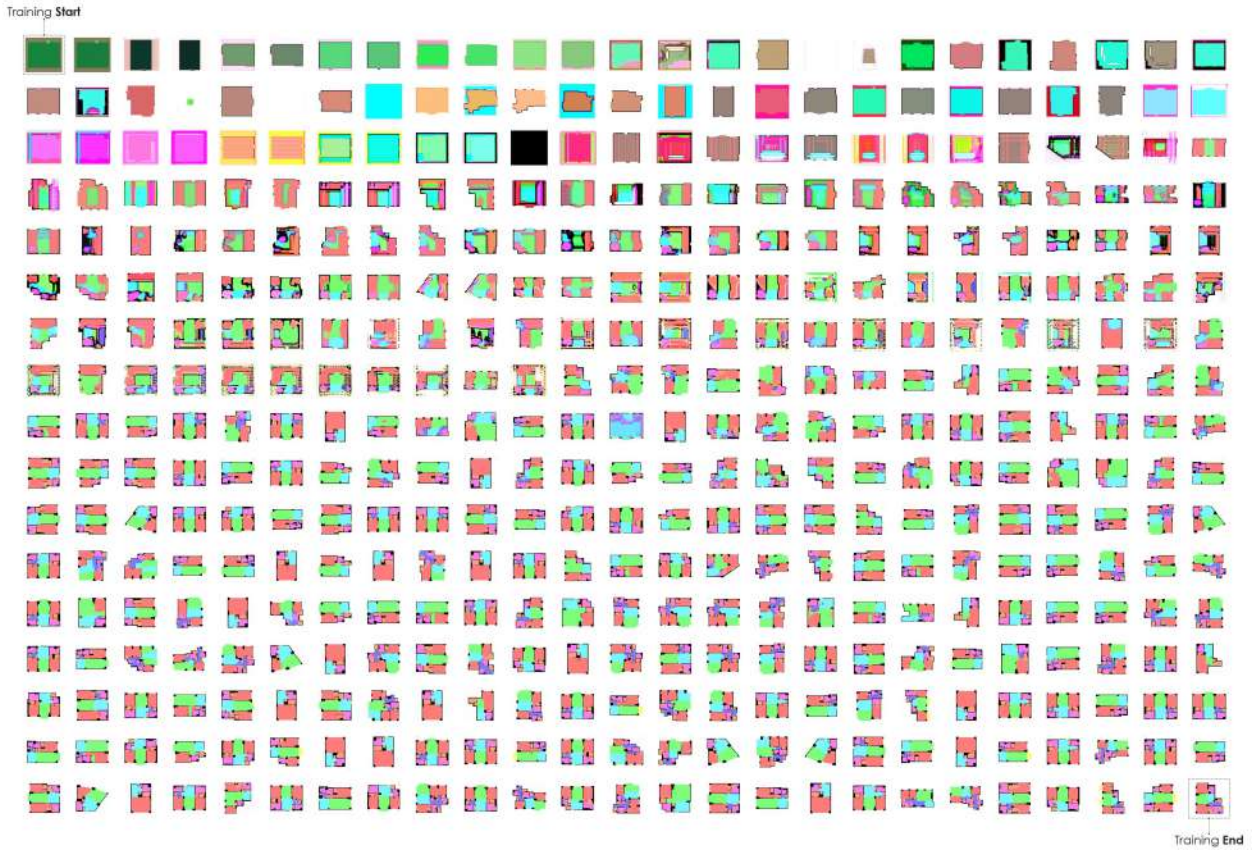
FLOOR DESIGN UI



Stanislas Chaillou, Harvard Graduate School of Design | June 2nd, 2019 stanislaschaillou.com/thesis/GAN/unit_program/

GENERATIVE DESIGN OF A FLOORPLAN





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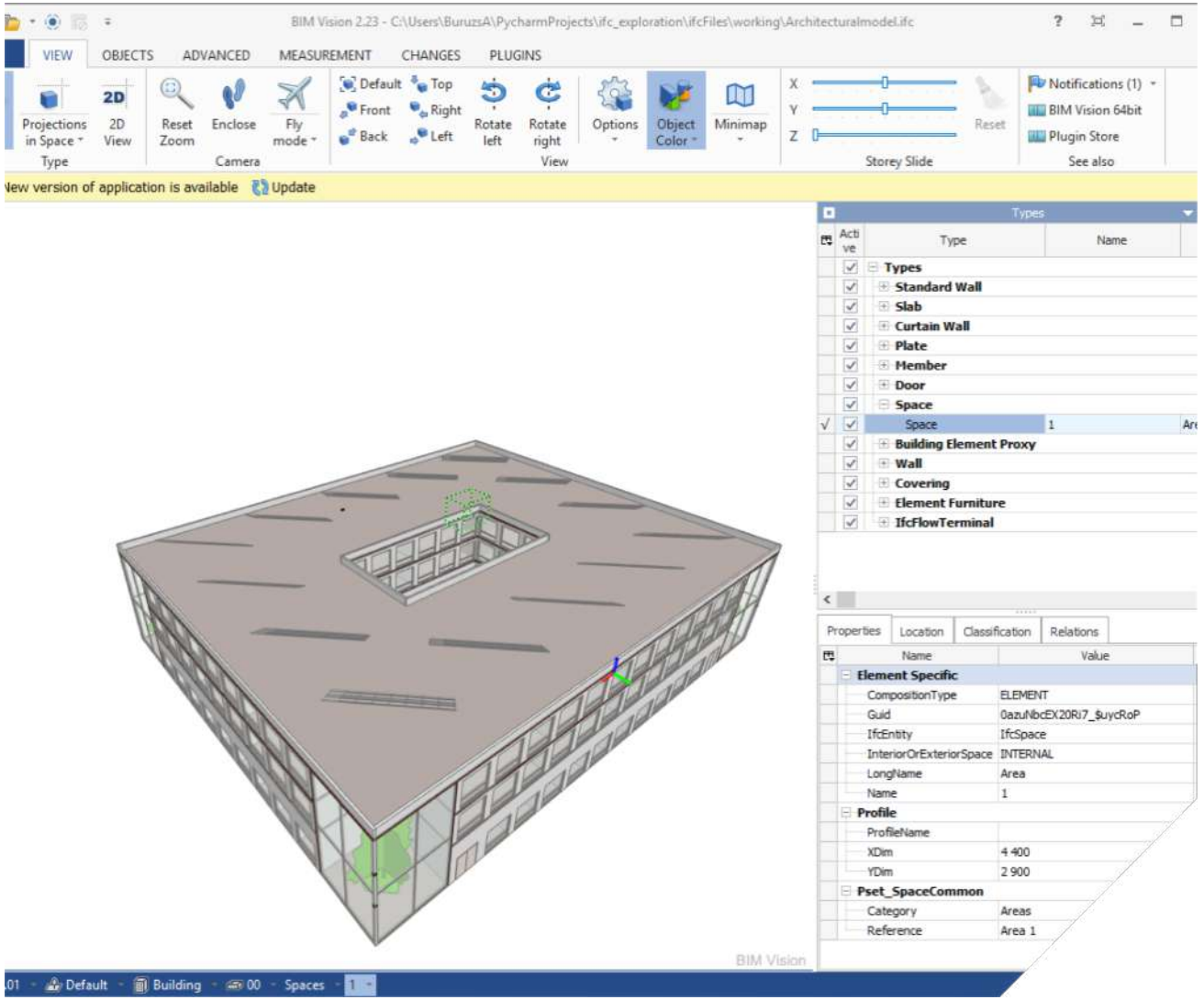
FIXING BIM MODELS

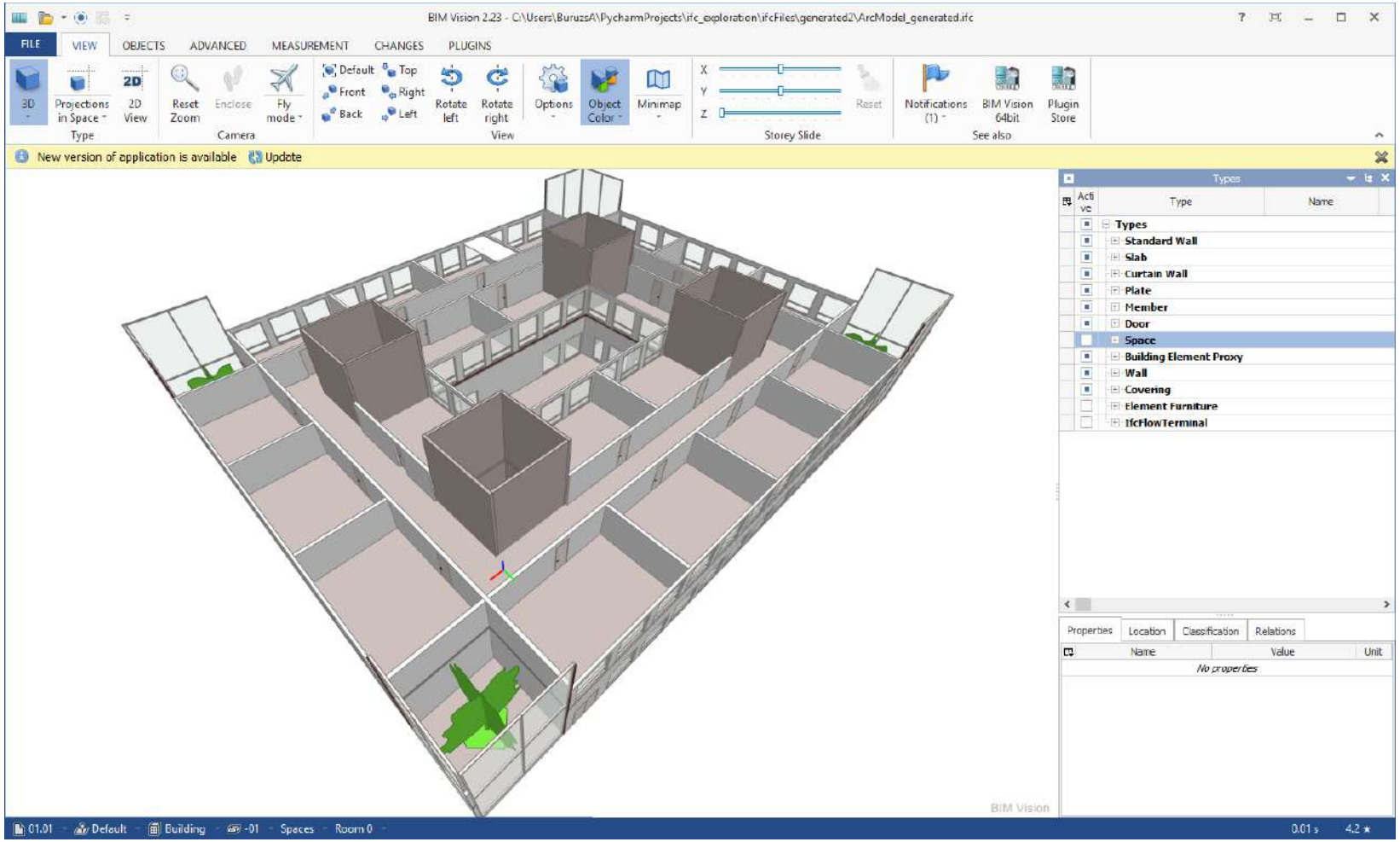
MISSING SPACES

- BIM Model missing ifcSpaces



MISSING IFCSPACES

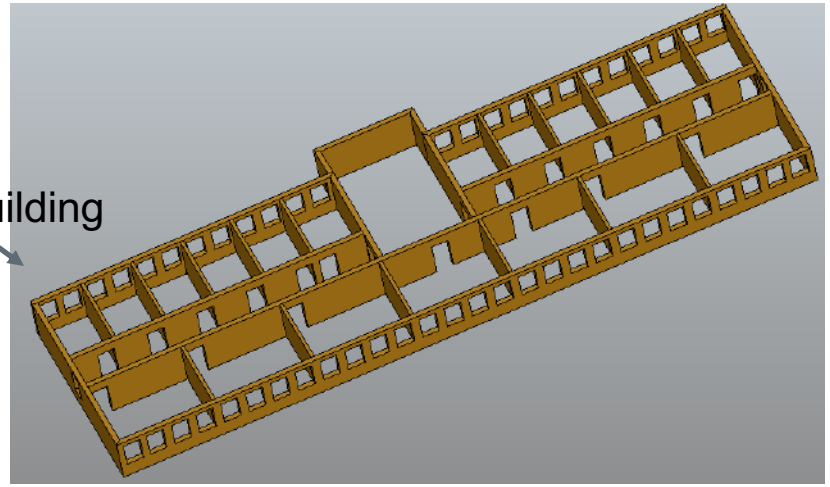
- BIM Model missing ifcSpaces



IFC SPACE COMPLETION

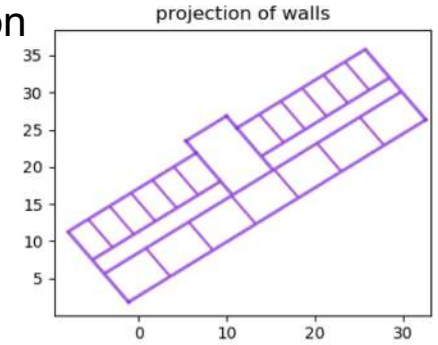
- IFC Space is often missing
- Needed: definition of the spaces based on the geometry of other elements (Walls)

IFC BIM Model

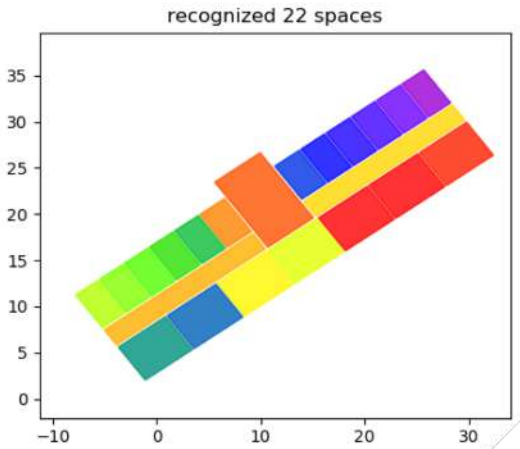


Select Building storey

2D projection



Geometric algorithm



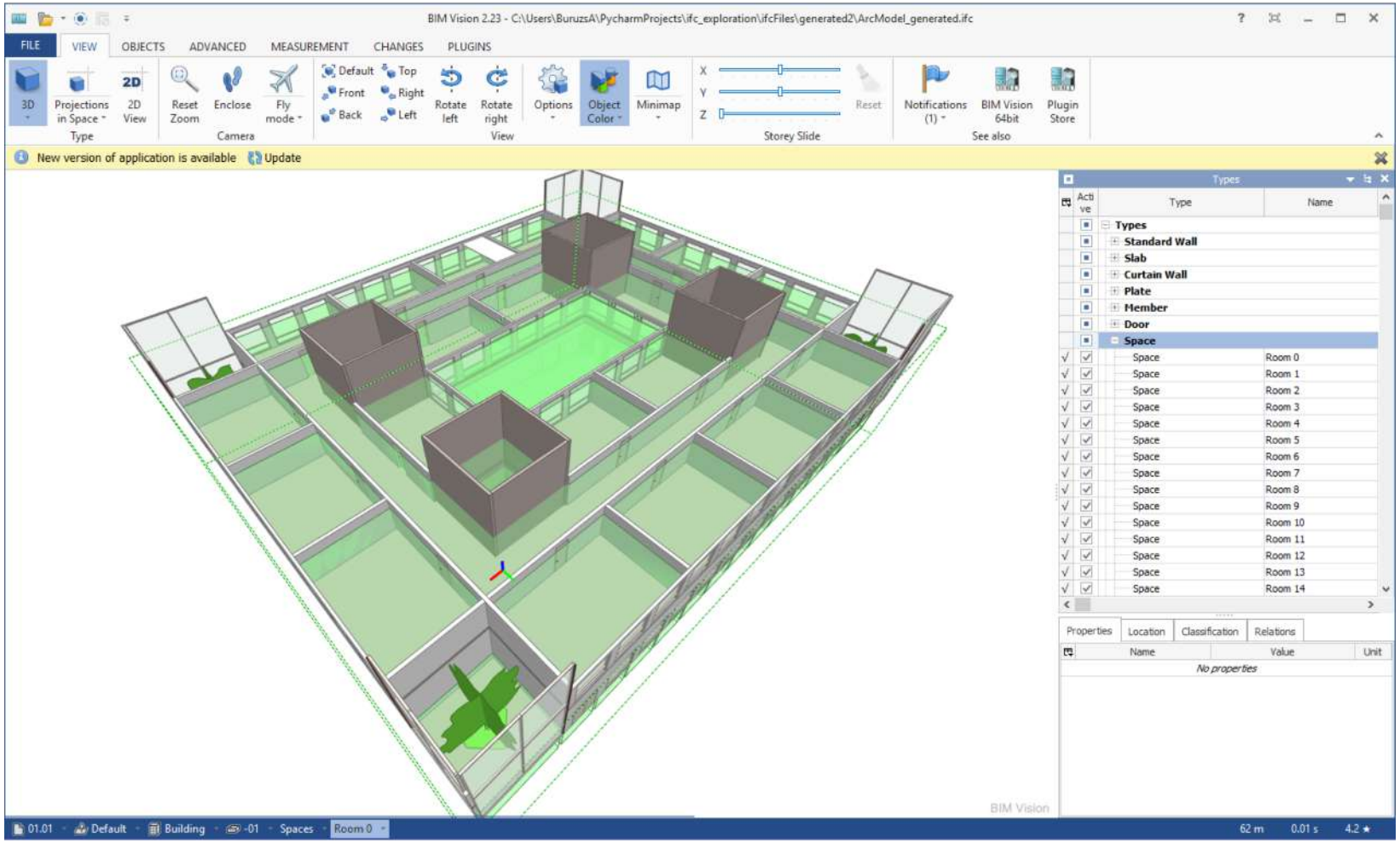
Extracting Floor height

3D geometry of the spaces (Swept solid from polygons)

Inject IfcSpaces with Aggregate Relations Back to the IFC object

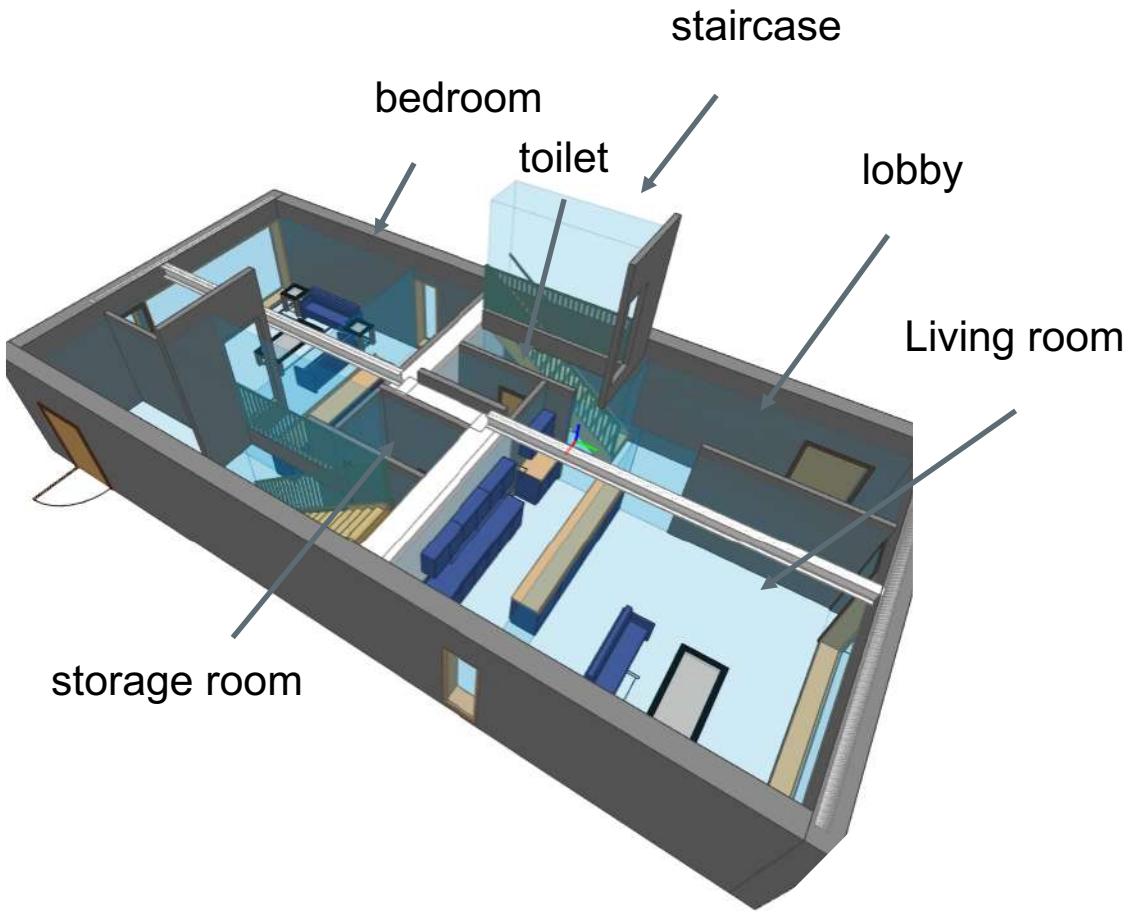
Improved IFC file

THE RECOGNIZED ROOMS ARE WRITTEN TO THE IFC FILE



IFC SPACE TAGGING

- Classification of Rooms/Spaces:
- Geometric features from the BIM Model.
- Needed: Labelled Training dataset with Ground Truth
- Machine Learning training for multiclass classification task




InFraReD
Intelligent Framework for Resilient Design

AI CHECKLIST

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Data

- Is your task data-driven?
- Do you have enough data?
- Do you have good data?
- Problems have to be mapped (manually) to a feature vector

Application

- Focus on tasks that are repeated often
- Focus on small parts, not the whole process
- Low cost of mistakes – recommender instead of decider

Operation

- AI is not „fit and forget“, it needs adjustments during operation
- Interaction between model output and your experts
  - Build feedback loops, make it easy to use

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THANK YOU!

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