

Generative Adversarial Networks (GANs) for the generation of realistic architecture models

Setting:

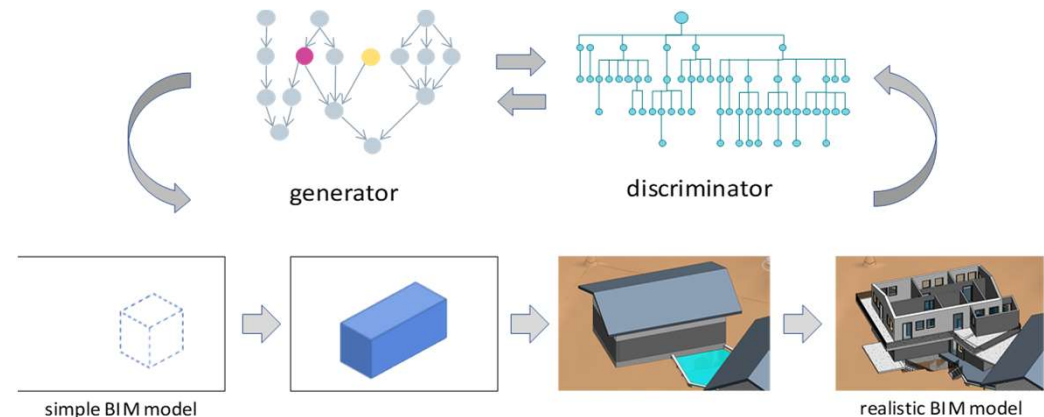
Generative Adversarial Networks (GAN) are a new approach to machine learning, which combines two different neural networks: (1) a generator network and (2) a discriminator network. The generator produces instances of objects, which follow certain principles (e.g. mounting a portrait of a person into an existing photograph or video).

The results are presented to the discriminator network, which was trained by real data. It gives feedback, whether the presented data is considered as being close to the training set or not. The generator tries to minimize the difference between its output and the training set and therefore improves over time.

Within the scope of this project, the networks should produce BIM IFC models, which are realistic with respect to certain specifications (IFC compliant, descriptive grammar, examples). The models will be taken as input to verify applications and simulations for building services (like fire detector placement, pedestrian stream simulation, energy simulation).

Project Characteristics

Modeling: ★★★★★
Mathematics: ★★★☆☆
Programming: ★★★★★
Science: ★★★★★



Tasks:

- Find suitable networks and combine them in the framework of GANs
- Generate simplified data and train the algorithm based on a criterion
- Extend the algorithm to produce IFC compliant models

This project will be supervised in cooperation with Corporate Technology of the Siemens AG.

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