

# Segmentation of Synthetic point clouds by implementing IFC Models

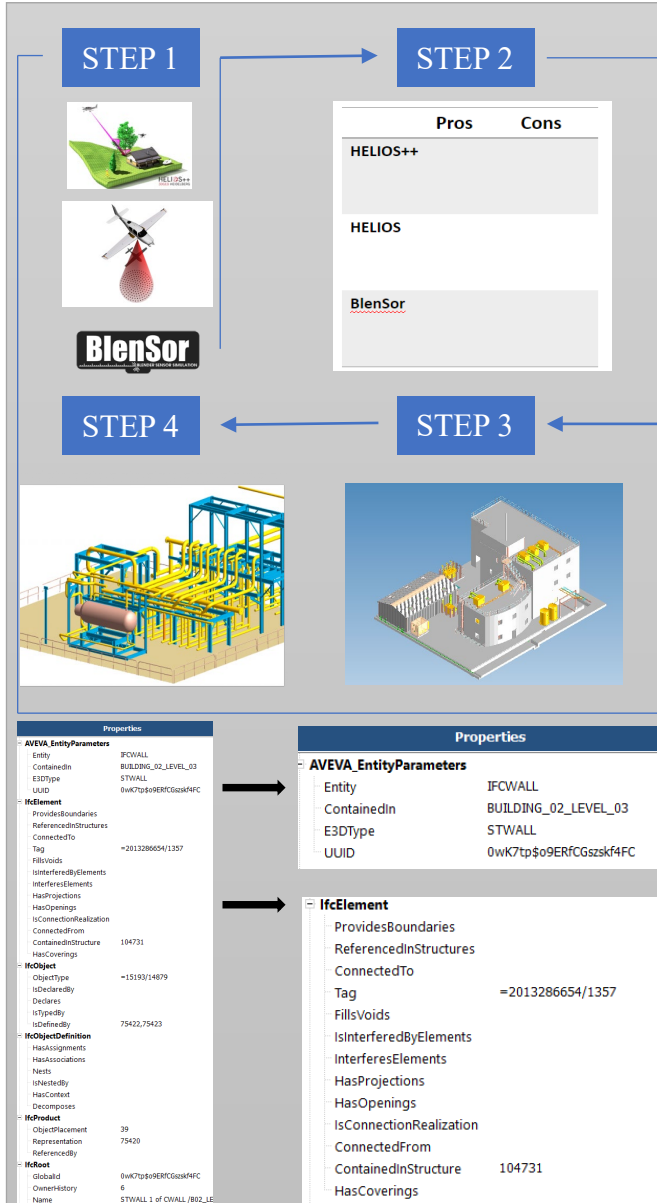
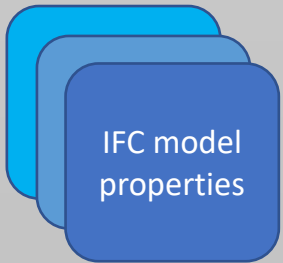
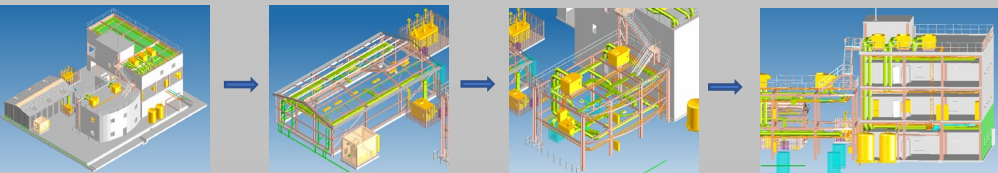
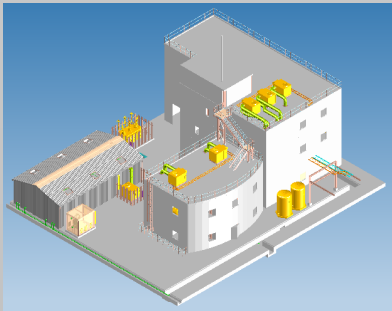
## IFC MODEL

- ❖ IFC models as input to the virtual 3D laser scanner
- ❖ Lower the cost of manual industrial point cloud labeling.

Object Class	IFCDUCTFITTING
COUPLING	
BEND	
ELBOW	
TEE	
CAP	
FLANGE	
REDUCER	

Object Class	IFCPIPEFITTING
COUPLING	
ELBOW	
TEE	
CAP	
FLANGE	
REDUCER	

## Open IFC Viewer



Properties	
- AVEVA_EntityParameters	
Entity	IFCWALL
ContainedIn	BUILDING_02_LEVEL_03
E3DType	STWALL
UUID	0wK7tp\$09ERfCGszskf4FC
- IfcElement	
ProvidesBoundaries	
ReferencedInStructures	
ConnectedTo	
Tag	=2013286654/1357
FillsVoids	
IsInterferedByElements	
InterferesElements	
HasProjections	
HasOpenings	
IsConnectionRealization	
ConnectedFrom	
ContainedInStructure	104731
HasCoverings	
- IfcObject	
ObjectType	=15193/14879
IsDeclaredBy	
Declares	
IsTypeOf	
IsDefinedBy	75422,75423
- IfcObjectDefinition	
HasAssignments	
HasAssociations	
Nests	
IsNestOf	
HasContext	
Decomposes	
- IfcProduct	
ObjectPlacement	3D
Representation	75420
ReferenceBy	
- IfcRoot	
GlobalId	0wK7tp\$09ERfCGszskf4FC
OwnerHistory	6
Name	STWALL_1 of CFWALL_#B02_LE

Properties	
- AVEVA_EntityParameters	
Entity	IFCWALL
ContainedIn	BUILDING_02_LEVEL_03
E3DType	STWALL
UUID	0wK7tp\$09ERfCGszskf4FC

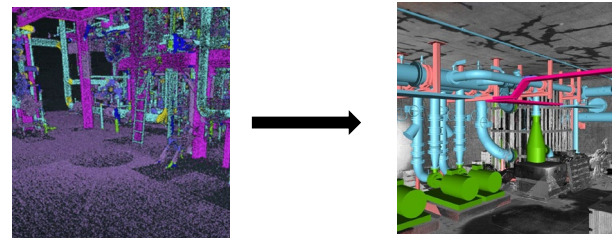
IfcElement	
ProvidesBoundaries	
ReferencedInStructures	
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Tag	=2013286654/1357
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ConnectedFrom	
ContainedInStructure	104731
HasCoverings	

## Background

- ❖ The 3D modelling of existing industrial facilities plays a pivotal role in cost, and it is a labor-intensive process (Agapaki et al.,2019).
- ❖ Geometric digital twinning (Agapaki, 2020) deep learning methods have reached a plateau in performance.
- ❖ Annotated datasets can be easily augmented with synthetic data.

## Research Gap

- ❖ There is **no thorough investigation** of virtual laser scanners applicable for industrial data.



## Objectives

- ❖ Extend knowledge of synthetic point clouds generation to **improve segmentation** of industrial facilities by using virtual 3D lasers.
- ❖ Recommendation of **most suitable virtual laser scanner** platform for use in industrial segmentation.
- ❖ Minimizing the data conversion for a more efficient generation of virtual scanned point clouds.