

Installation

NB: This software requires [Rhinceros](#) and [Grasshopper](#)

1. Clone or download the repository
2. Copy all the files from the components folder
3. Paste the files into the Grasshopper User Objects Folder (optionally create a subfolder for the files)

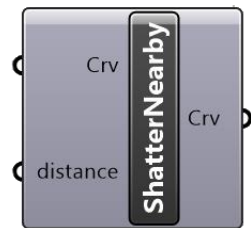
Documentation



Shatter Nearby Curves

Preparation > [ShatterNearby](#)

Shatters each curve at every point on the curve that is nearest to the endpoints of other curves that are within the specified distance



Inputs

Name	Description	Type
Crv	Curves to split and also the curves whose endpoints split them with.	curve
distance	Maximum distance from endpoint to curve that is shattered.	number

Outputs

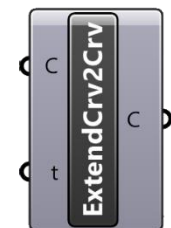
Name	Description	Type
Crv	All shattered curves	curve



Extend Curve to Nearest Curve

Preparation > [ExtendCrv2Crv](#)

Extends curves until they hit another curve if there is one within the distance threshold



Inputs

Name	Description	Type
C	Curves to extend. They will all be extended to each other if possible.	curve
t	Distance threshold.	number

Outputs

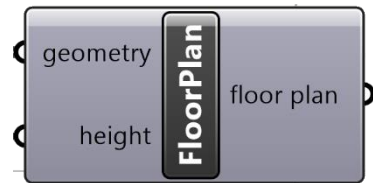
Name	Description	Type
C	Wall Curves	curve



Floor Plan

Preparation > [FloorPlan](#)

Creates a 2D Floor Plan using the input geometry. If the input is a brep or mesh, the input height is used to create the contour in the given height. If it is a curve, it is simply projected onto world XY-plane and outputted as a floor plan (curves).



Inputs

Name	Description	Type
geometry	Curves, meshes or breps, representing a building	mesh/brep/surface/curve
height	The desired height for a floor plan	number

Outputs

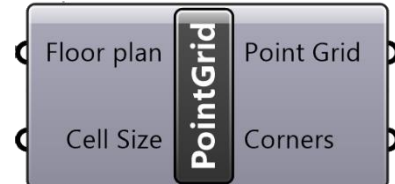
Name	Description	Type
floor plan	2D floor plan of the input geometry composed of curves.	curve



Point Grid

Preparation > [PointGrid](#)

Creates a 2D point grid of a given cell size, covering all the given curves (floor plan). An extra row of points is added in all directions, to make sure the grids corner points is not inside the building geometry.



Inputs

Name	Description	Type
floor plan	Curves representing a buildings geometry in a given height	curve
cell size	The distance between each point in the grid	number

Outputs

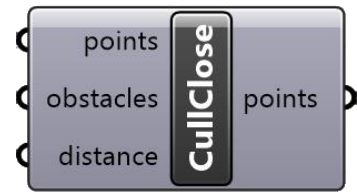
Name	Description	Type
point grid	A set of points covering the entire floor plan	point
corners	The 4 corner points of the grid	point



Cull Close Points

Registration > [CullClose](#)

Removes all points that are within the given distance of obstacle curves.



Inputs

Name	Description	Type
points	Collection of points to cull	point
obstacles	Curves for which nearby points are culled	curve
distance	Maximum distance between obstacle and point for a point to be culled.	number

Outputs

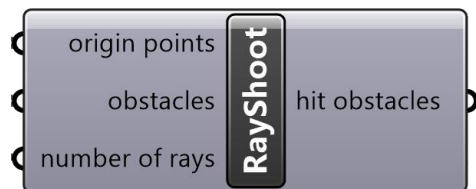
Name	Description	Type
points	Collection of points with the points that are too close removed.	point



Identify Visible Objects Using Ray Casting

Registration > [RayShoot](#)

Identifies the room bounding objects by shooting rays from every origin point in a given number of directions equally spaced around each point. The objects that are hit are returned in sets belonging to each origin point (for later set union). Outside origin points are culled as they collectively have rays that does not collide with anything.



Inputs

Name	Description	Type
origin points	A collection of origin points for the rays	point
obstacles	All curves that should be considered for collisions with the rays.	curve
number of rays	Number of rays to calculate for each origin (distributed equally around the point in a circle)	number

Outputs

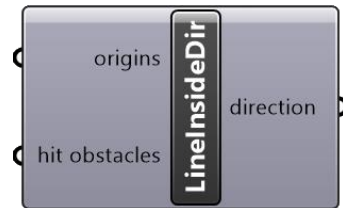
Name	Description	Type
hit obstacles	The curves for which the rays collided.	curve



“Inside” Direction of Line

Registration > [LineInsideDir](#)

Finds the direction pointing inward towards the room, perpendicular to the input line. It does this by finding the direction of the origin point that the line was identified with. It therefore needs these points (in the same order).



Inputs

Name	Description	Type
origins	Origin points of the previous rays that identified the obstacles.	point
hit obstacles	Room bounding lines identified by rays.	curve

Outputs

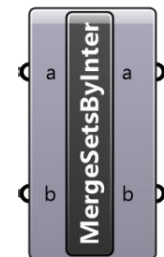
Name	Description	Type
directions	Direction vector pointing inward towards the room perpendicular to the corresponding curve.	vector



Merge Sets by Intersections

Registration > [MergeSetByInter](#)

Merges sets of objects if they overlap by a minimum of all their objects except one. By object is meant a tuple consisting of an object from both a and b as the objects are paired on a one-to-one basis between sets a and b. A merge will only happen if it pairs objects from list a and list b on a



Inputs

Name	Description	Type
a	Object set collection a	curve
b	Object set collection b	vector

Outputs

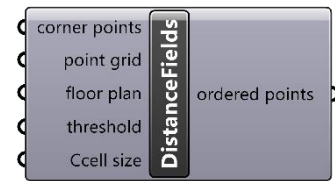
Name	Description	Type
a	Merged object set collection a	curve
b	Merged object set collection b	vector



Distance Fields

Registration > [DistanceFields](#)

Removes all points that are closer than the given threshold to any curve in the floor plan. Also groups resulting points based on internal distance, and thereby creates sets of distance fields/ordered points.



Inputs

Name	Description	Type
corner pt	The four corner points from the point grid	point
point grid	The set of points covering the entire floor plan	point
floor plan	The input geometries contour	curve
threshold	The maximum allowed distance, to any wall e.g. half of the thickest wall from the input floor plan	number
cell size	The distance between voxels	number

Outputs

Name	Description	Type
ordered points	Sets of distance fields	point



Surface from Point Trail

Reconstruction > [PntSrf](#)

Creates a surface by creating a closed polyline through the points in order.



Inputs

Name	Description	Type
points	Points for surface boundary in order (!)	point

Outputs

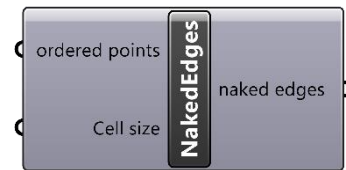
Name	Description	Type
surfaces	Resulting boundary surface	surface



Naked Edges of Point Collection

Reconstruction > [NakedEdges](#)

Extracts the boundary edges of the point collection by Delaunay triangulation of the ordered points, and filtering edges that are above the diagonal of the cell size.



Inputs

Name	Description	Type
ordered points	Points ordered around the boundary	point
cell size	The distance between voxels	number

Outputs

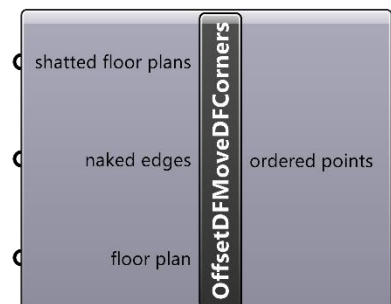
Name	Description	Type
naked edges	The boundary of each point set	curve



Offset by distance fields + move corners

Reconstruction > [OffsetDFMoveDFCorners](#)

Offsets each vertex in the room bounding curve with its distance to the existing floor plan curves. Identifies corners of the room bounding curve, based on internal angles between the points, and moves them to the closest end point of the floor plan curves (If any two corner points are moved to the same end point, only the closest point is moved).



Inputs

Name	Description	Type
shattered floor plans	Floor plan shattered by "Shatter Nearby Curves"	curve
naked edges	The boundary curve of each point set	curve
Floor plan	The input geometries contour	curve

Outputs

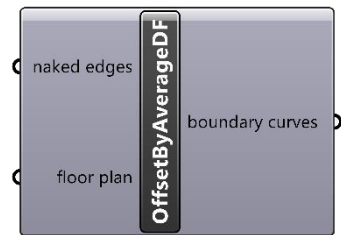
Name	Description	Type
ordered points	"Manipulated" distance fields boundary points, in the correct order	point



Offset by the Average Distance Field

Reconstruction > [OffsetByAverageDF](#)

Offset closed boundary curves (Naked edges) with the average of the distance field for each set of points



Inputs

Name	Description	Type
naked edges	The boundary curve of each point set	curve
floor plan	The input geometries contour	curve

Outputs

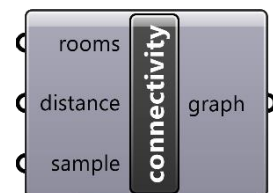
Name	Description	Type
boundary curves	"Manipulated" boundary curve	curve



Room Connectivity Graph

Postprocessing > [connectivity](#)

Find the adjacent rooms for each room. The returned adjacency graph will contain a list for each room containing the indices of the rooms that are adjacent to it.



Inputs

Name	Description	Type
rooms	Surfaces of the rooms to analyze	brep
distance	Distance from the room to check for other rooms	number
sample	Distance between sample points (lower = more points)	number

Outputs

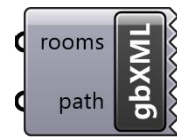
Name	Description	Type
graph	Adjacency graph representation of room connectivity	list



Export Solids to gbXML

Postprocessing > [gbXML](#)

Exports solids to gbXML by iterating through their faces and vertices



Inputs

Name	Description	Type
rooms	Solid of the rooms to export	brep
path	Place to save the gbXML file	string