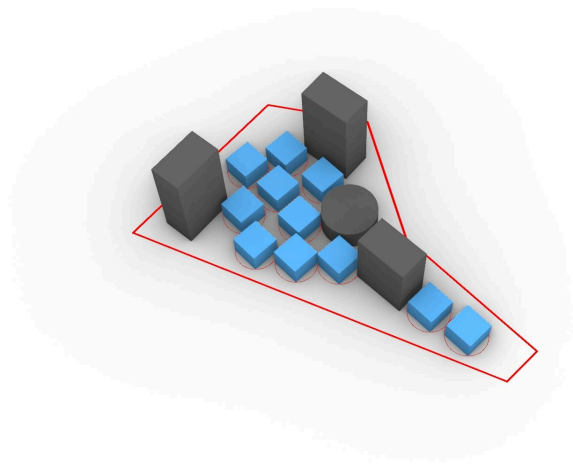
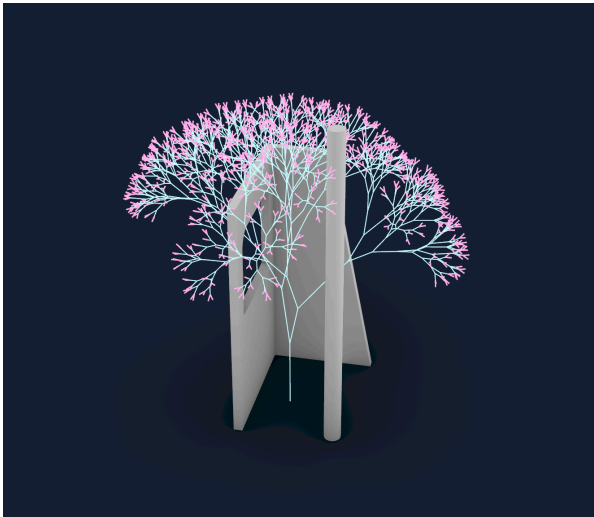
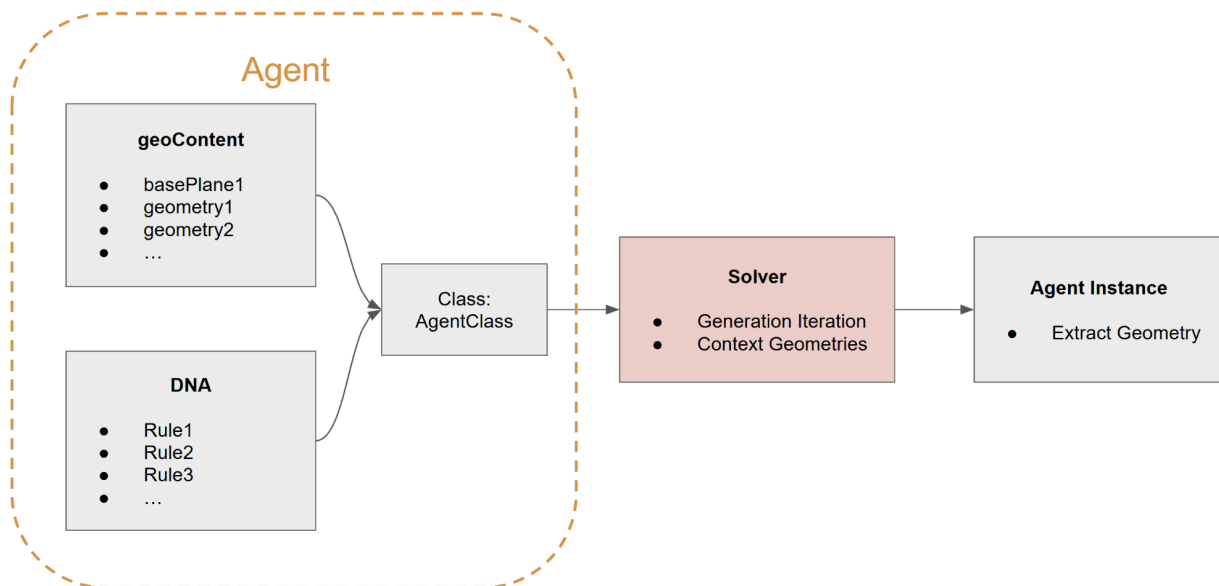


Agent Packer - Coral | v0.1.2-alpha release 260624



Hi community, this is a brief introduction to AgentPacker. The concept of this plugin is to provide an easier platform to set up a multi-agent algorithm in Grasshopper.

The spirit of AgentPacker lies in the definition of agents. An agent can be thought of as a simple entity that contains **groups of geometry (geoContent)** and has a **sequence to DNA** to detect and react to its neighbours and the context.



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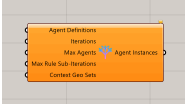
The best way to understand or try out AgentPacker is to start with sample scripts. The following are sample scripts and the functionality they used.

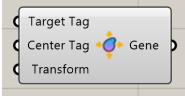
Sample Scripts	Descript and key components used
Demo1_Fracto	Intro to the workflow of AgentPacker - Coral, start here! • Define Agent • DNA Assembly • Iteration Solver
Demo2_multipleExpansion	Deeper dive on how to populate new agents, with conditional control • Rule Expansion • Conditional Trigger (See p.5 for details)
Demo3_removeDupPt	Intro on detection-action DNA sequence • Multiple types of agents • Rule Detect collision proxy • Rule Kill
Demo4_Relaxation	3D Relaxation with detection-action DNA sequence • Using sub-iteration in the iteration solver for detection • Rule Escape
Demo5_contextReaction	Taking static context geometry into collision detection • Define contextGeoSet • 2 sets of detection-action
Demo6_TreeGrowth	Using most of the rules to create a context-aware tree generation

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While thorough documentation is not established yet, the following are explanations of some of the components

Iteration Solver		
	Input	Notes
	Agent Definition	The user can input 1 or more agent types
	Iterations	The number of loops the solver will perform
	Max Agents	A safeguard on the number of agents, to avoid freezing grasshoppers
	Max Rule Sub Iteration	If agents are having a collision-action DNA sequence, sub-iterations will be run within each iteration for a smoother reaction
	Context GeoSet	The user can input 1 or more context GeoSets

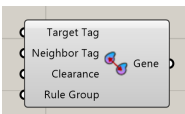
Rule Transform		
	Input	Notes
	Target Tag	If provided, the solver will only transform the geoltem that matches the tag
	Center Tag	If provided, the transform will be based on the CPlane represented by the center Tag
	Transform	Grasshopper transform

Rule Expansion		
	Input	Notes
	Center Tag	Imagine this as the base plane for the orientation of the children agents
	Expansion Plane Tag	Imagine this as the target plane for the orientation of the parent agent; more than one plane can be referenced by this tag
	Spawn Count	Number of child agents to be generated, this number should represent the list length of transform
	Child Transform	Grasshopppter transform applied to children agents

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Rule Detection Collision Proxy can only be run on **points/curves** of agents; this rule is specifically used to do **agent-agent collision check**; the core logic is calculating the minimum distance and checking if the distance is within clearance.

Rule Detection Collision		
	Input	Notes
	Target Tag	Leave empty to check all the points and curves within agents. If provided, a minimum distance check will be performed on this geoltem group in the current agent
	Neighbor Tag	Leave empty to check all the points and curves within agents. If provided, a minimum distance check will be performed on this geoltem group in the neighbour agent
	Clearance	Numeric value to set the minimum distance check threshold
	Rule Group	Compulsory Rule Group key to be used by Rule Escape or Rule Kill

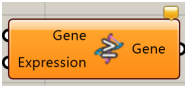
Rule Detection Context Collision Proxy can only be run on **points/curves** of agents compared to **point/curve/surface/brep/mesh of context GeoSet**; this rule is specifically used to do **agent-context collision check**; the core logic is calculating the minimum distance and checking if the distance is within clearance.

Rule Detection Context Collision		
	Input	Notes
	Target Tag	Leave empty to check all the points and curves within agents. If provided, a minimum distance check will be performed on this geoltem group in the current agent
	Context Key	The user can use the key to specify which context geoSet to check
	Context Tag	Leave empty to check all the geometries within the context. If provided, a minimum distance check will be performed on this geoltem group in context
	Clearance	Numeric value to set the minimum distance check threshold
	Condition Mode	0 treats mesh/brep as surface, 1 treats them as solid
	Rule Group	Compulsory Rule Group key to be used by Rule Escape or Rule Kill

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User can use a conditional trigger to bypass a rule in the DNA sequence, based on n (current iteration count in solver)

Conditional Trigger		
	Input	Notes
	Gene	Rules, the conditional trigger component shall be used between the rule and the Assembly DNA
	Expression	Logical expression against n (current iteration count in solver)

Here are examples of expression user can input

Expression	Meaning
true	Always run
false	Never run
*empty	Always run
$n == 0$	run only at iteration 0
$n != 4$	Skip iteration 4
$n < 5$	Run before iteration 5
$n \geq 3$	Run from iteration 3 onward

Expression	Meaning
$n \bmod 2 == 0$	Run on even iterations
$n \% 2 == 1$	Run on odd iterations
$n < 1 \parallel n > 5$	Run before iteration 1 and after iteration 5

Get Geo by Tag vs. Filter Geo Tag

Get Geo by Tag takes geoContent as input and extracts geoltems with the same tag.

Filter Geo Tag takes a list of geoltems as input, and filters out geoltems with the same tag.