Definitions of Functions within Distorted Grid

(Grasshopper)

Base Surface Setup

- PlaneSrf: Generates a planar surface from a base plane (XZ plane here) with the given Y Size slider controlling one dimension.

- Divide Domain / Isotrim (SubSrf): Subdivides the surface into smaller panels or UV domains, based on your V Count slider (number of divisions).

Purpose: Creates a grid of smaller surfaces that you'll later use as reference units.

Surface Evaluation & Point Generation

- EvalSrf: Evaluates a surface at specific UV parameters. The Graph Mapper above is connected to provide varying UV coordinates — this allows parametric control over where on the surface points are sampled.

- Vec2Pt: Likely converts evaluation outputs into point coordinates.

Purpose: Finds a control point on each sub-surface using a UV relationship (defined by the Graph Mapper).

Geometry Centering & Distance Mapping

- Area: Finds the centroid of each subdivided surface.

- Pull: Projects or "pulls" points (from EvalSrf or another source) onto the subdivided surfaces or reference geometry.

- Bnd (Bounds) + Remap + Dom: Standard setup to normalize distances (mapping a set of distances into a new domain, usually 0–1 or a custom range).

Purpose: Measures and normalizes spatial relationships (distance from a reference point, area center, or attractor).

Transformation & Movement

- Amp (Amplitude): Scales a vector to control the movement distance.

- Move: Moves points along that vector direction (probably the surface normal or vector from area centroid).

- pDecon: Deconstructs points into X, Y, Z values — possibly for visual debugging or remapping components later.

- Pt: Reconstructs points after the manipulation.

Purpose: Moves points vertically or along a normal based on a mapped value (often tied to an attractor logic).

Parameter Sliders

- Domain Start, Value, Factor, etc., act as control parameters:

  - Factor influences scaling strength.

  - Domain Start defines remapping input.

  - Value and Neg work together to control direction or inversion of movement.

Purpose: Provide flexible numeric control over surface behavior and deformation.

Point Structuring and Curve Creation

Pt → Partition → Flip → Nurbs

- Pt: These are the points generated earlier (likely from your subdivided or moved surface grid).

- Partition: Groups points into sets (usually corresponding to rows or columns of your subdivided grid). This ensures the curve creation happens row-by-row or

column-by-column.

- Flip Matrix: Reorients or transposes the data tree — swapping U/V direction if needed (so curves flow correctly along the intended direction).

- Nurbs Curve (Nurbs): Creates smooth NURBS curves through the grouped points. The Degree slider controls curve smoothness (higher = smoother, more flexible).

Purpose: Generates smooth, continuous curves across your grid of points, forming the structural skeleton of your design.

Curve Refinement and Offset Operations

Rebuild (ReB)

- Rebuild Curve refines the NURBS curve by resampling it with a set number of control points (controlled by the Count slider).

  - This cleans up data and ensures all curves have consistent complexity.

  - Useful for downstream lofting or surface operations.

Flatten → Offset → Graft → Loft

- Flatten: Flattens the data structure so all curves are treated as one list (avoiding nesting issues).

- Offset: Offsets curves by a specified Distance (slider) — likely creating an inner and outer boundary.

- Graft: Splits each curve into its own branch again (for proper pairing in the next step).

- Loft: Creates a lofted surface between the original and offset curves.

Purpose: Builds surface panels or skins by offsetting and lofting curves, controlling their spacing with the Distance slider.

Extrusion and Thickness Control

Extrude (Extr)

- The lofted surface is extruded using a vector input (Y) multiplied by a Factor slider.

- The extrude direction determines the 3D thickness or height of your generated geometry.

- You have a second extrusion chain (bottom right) that appears to extrude in the opposite direction — possibly to create a double-layered or solidified form.

Purpose: Gives 3D volume to the lofted surfaces, transforming them into panels, ribs, or shells.

Secondary Geometry Movement (Bottom Chain)

Move + Extrude

- The Move component shifts geometry (probably the lofted or offset surfaces) by a controlled distance.

- The second Extrude with its own Factor slider might generate additional depth, layering, or base offset.

Purpose: Adds an additional layer of control — moving or thickening geometry for fabrication or visual

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Rebuild Section

- The "Rebuild" (ReB) component resamples a NURBS curve with a defined number of control points.

- A Count slider (set around 150) determines how many control points are used.

- This makes the curve smoother and more uniform, preparing it for downstream operations.

Merge and Split Chains

- The rebuilt curve (ReB) output is merged with other geometry or curve data using a Merge component.

- The merged curves are passed to a Split and Area analysis chain.

    - The Area component measures the area and centroid of shapes.

    - The results (area centers) are used downstream to control transformations such as offsets or movements.

Offset (Red Component)

- This is where the curves are offset inward/outward using a value from a slider (Value or Distance).

- There's also a Neg (Negative) component, flipping the sign of the offset distance, likely to control whether the offset goes inward or outward dynamically.

Secondary Geometric Movement

- This labeled cluster adds "an additional layer of control."

- It includes:

    - A multiplication (*) factor.

    - An Extrude (Extr) and Move operation.

- The factor sliders (0.8, 1.0) modulate the amount of extrusion/movement, giving finer control over the geometry's secondary deformation.

Boundary (Orange Component)

- The Boundary component takes curves (after offsetting) and creates boundary surfaces from closed planar curves.

- These boundaries feed into a Split and Extrude pipeline to generate 3D forms.

Loft and Extrude

- Another set of curves are offset, grafted, and lofted together to form continuous surfaces.

- The resulting loft is extruded using a conditional factor (>, Extr).

- This adds a vertical or thickness dimension, likely to build a second surface layer.

Final Outputs

- Multiple extrusions and surfaces are merged and split to produce a composite geometry.

- This layered setup gives the designer control over both primary (main NURBS curve) and secondary (offset + extrusion) manipulations.