

Gradients

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While gradients within the architectural discipline have been an established instrument used in conjunction with surfaces, facades, and planar geometries, it has long run its cause as a decoration tool. Some of the most valuable gradients are therefor based on volumes rather than surfaces. Gradients within the surface realm rely on variable parameters (geometry, line density, line type, line weight, line color, background color) and gradient organizations.

The effect produced on surfaces ranges from breaking up scales, organizing components distorting fields, optical illusions, to a re-reading of surface itself. Fixated on pixel, pattern and component compositions, gradients require a paradigm shift to other geometric applications.

This research project proposal will focus on the idea of typological gradient. These instances are developed as a generative design tool to shift from surface to volumetric gradients through the means of vector data. We are resuscitating the vector, which is commonly used within gradients, as a vessel for representation.

We will analyze and define gradient properties and implement these through typological studies specific tower project proposals. The work and research shown in this submission was developed by students of the Gradient Tower Studio in spring 2013.

Understanding gradients relates to the production of emergent characteristics and multiple readings, which can be defined as a transitional sequence between two or more inputs. All parameters of these inputs are interchangeable and hence result as a vast amount of gradient variations. Within this zone of gradience we encounter properties of emergence, variation, transition, reorder, relationships and synthesis. In order to study gradients as a generative design tool, we will take advantage of these emergent characteristics and focus on a shift from surface to volume in architecture.

Gradient Volume to Typology

Typological gradients start to challenge familiar archetypes (e.g. block, tower, bar) by investigating its effect on volume rather than surface. These 3-dimensional gradients are categorized as geometrical operations such as morphing (Polygon), blending, or lofting (NURBS). Within the following gradient studies we will analyze and apply these techniques to types in order to pursue new form. Within these gradient studies and included projects we will also negotiate relationships of object and field/ground. The traditional tectonic system places the object within the field with minor aspects of synthesis, composition, or informative feedback. Typological gradient operations have the potential to transition, blend, and correspond within these multi- informative components. The compositional organization implies the play between multi- directional and omni-component gradients.

Gradients offer rich and variable typological outputs for architecture with the potential to produce exceptional complexity, new territory, and opportunity.

DISCIPLINARY GRADIENTS

Gradients have long been implemented within the history of artistic disciplines. This project investigates its use in the following disciplines:

- PAINTING / Paint Gradients**
- PHOTOGRAPHY / Photo Gradients**
- SCULPTURE / Sculpture Gradients**
- GRAPHIC DESIGN / Pattern Gradients**
- ANIMATION / Motion Gradients**

In his book *Shades*, Beverly Sussman writes: "The word 'gradient' was coined by Michael J. Griffin in the early 1980s. It has a Latin root, *gradus*, meaning 'degree', namely the ability to move from one state to another gradually. The idea of 'Gradient' in painting was introduced in the Renaissance period. sfumato is one of the four classical painting techniques of the Renaissance. The other three techniques are *Chiaroscuro*, *Contrasto*, and *Uffizi* (color). The most prominent application of sfumato was Leonardo da Vinci. The painting of the Mona Lisa, for example, shows the characteristic sfumato 'without lines or borders, in the manner of smoke or beyond the focus plane'.

GRADIENT ORGANIZATION

Gradients produce emergent characteristics and can be defined on a horizontal axis between two or more inputs. A parameter of gradient values, within the area of gradient, we encounter progression of emergence, variation, transition, reversal, transformation and systems.

The systematic approach to produce emergent effects relies on three main gradient organization: *blend*, *translucent* and *compositional*.

The following techniques are studies of gradient effects produced with various parameters (geometry, line density, line loop, line weight, line color, background color) and gradient organization.

Surface vs. Topological Gradients

Surface Gradients

Topological Gradients

The use of gradients within structural surfaces is very common. We frequently observe gradient within facade walls, floors, or other static geometries. Topological gradients require more simple graphic rendering, to colour shading is connecting with the introduction of algorithmic computation within real world, these operations have been almost ad infinitum.

Topological gradients used to combine various archetypes (e.g. block, tower) but by investigating its effect on volume rather than surface. These 3-dimensional gradients are categorized as *geometrical* operations such as merging (Program), blending or tiling (Blender), where the

LOF SHOWER Archetype

L to TOWER Archetype

