In 2006, Frank Gehry completed his first building constructed entirely of glass. The Interactive Corporation Building in New York, or IAC as it is known, broke new ground in terms of the degree to which mass-customization of building components drove the design and construction process in a time when visual programming was limited. Additionally, the baked on ceramic white dots, or fritted glass, cover each of those glass panels; attesting to the complexity of its coordination with regard to each individually composed pattern piece on glass. Reflecting on the exactitude of the design (Brandt 2012), fabrication and coordination for IAC prompted this investigation into methodologies for capturing digital serendipity or “glitches” and turning them into “formal” aspects of a digital design process.

Like Gehry’s rigorous model-making design process (Friedman 2002), the same held true for the execution of the frit pattern. The pattern had to conform to several constraints such as the height of the office desks, the necessity to see out without graphic obstruction and the exterior visual suppression of the spandrel panel or horizontal banding by a use of a gradient pattern. Most importantly, the white silkscreen pattern had to achieve overall fifty percent opacity across the building for the basic reason of reducing the HVAC tonnage.
The use of raster data was ruled out due to the limitations for customization of the pattern and the size of the panels at the resolution required. AutoCAD was chosen as the platform as it was the easiest to write a custom pattern generator for at the time. A serendipitous “Bleed Test” aligned the circumference of each dot to the bleed of the silkscreen fabrication, making the dot size smaller in its production than in its final output. Several parameters were also established in this process to allow variation in the percentage of dot density and unique levels of gradation for each panel.

Maintaining the data in vector form for design production was extremely processor-intensive and resulted in very long pattern generation times and very slow resultant files. So much so, unexpected, alternative patterns (glitches) started appearing (Figure 1) from the plotter. In retrospect, these (re)configurations constitute a more complex and nuanced outcome worth redressing for its irregularity, greater three-dimensionality and mapping of uncontrolled data.

The IAC case study above is an example of what the research constitutes a “found distortion filter” in architectural design. In this case, a bug in the internal RIP of the Oce plotter “incorrectly” processed the incoming vector data into a result that bears no resemblance to the original but is remarkable for its depth and complexity and could not have been generated by the authors using conventional means.

This can be contrasted with the idea of a “constructed distortion filter” which would be a process step (hardware or software) designed to introduce visual distortion (ted.com/speakers/reggie_watts).

Further investigation is underway into methodologies for generating frit through constructed distortion and turning these patterns into “formal” aspects of the digital design process. As such, point cloud data harvesting provides a mechanism for serendipity in the generation and/or hosting of frit patterns and distortion filters with CAD and BIM platforms (Figure 4).

The research demonstrates a classic example of benign “hacking” or “repurposing of something physical or digital in a way not foreseen (benign hacking)—or explicitly against (cracking)—the original intentions of its designer. To address the claim that parametricism today falls short of its potential to correlate multivalent processes or typological transformations, parallel meanings, complex functional requirements, site specific problems or collaborative networks (Meredith 2008) this research intends to develop parametricism to control environmental data inputs at the truly granular scale.

WORKS CITED
http://www.ted.com/speakers/reggie_watts.html

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