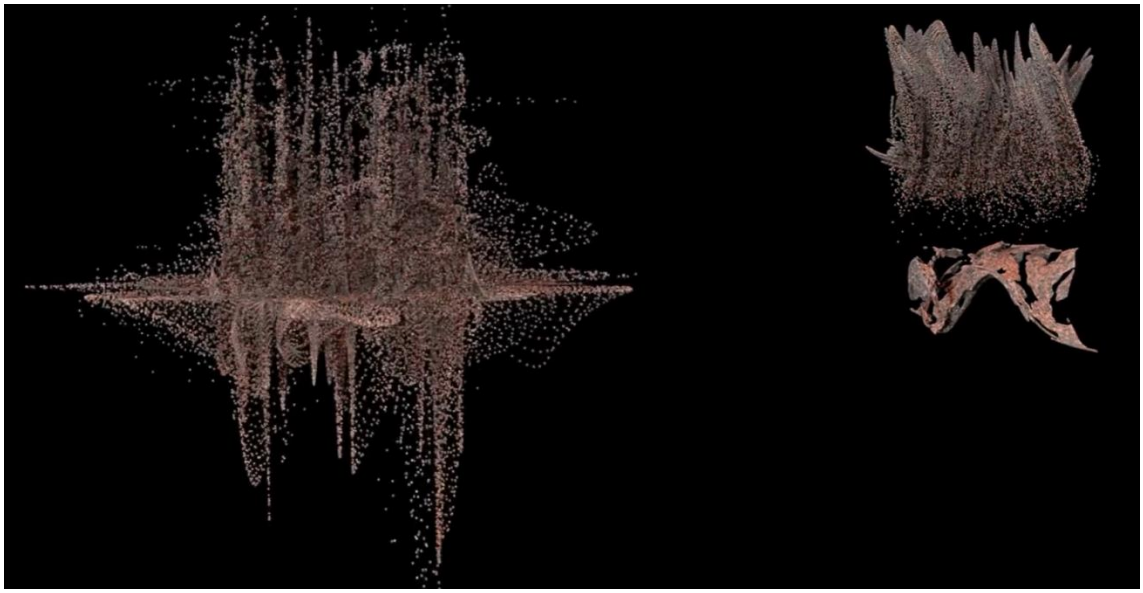
Work Title: Parametric Point Clouds: An Exploration into Computational Architectural Visuals

An aesthetically affecting project that explores the generation of generative architecture forms utilising TouchDesigner's point cloud algorithms, motivated by architect Zaha Hadid's organic and parametric approach.

(https://vimeo.com/manage/videos/940828672/privacy)

Using generative visuals, Parametric Point Clouds is a look into the field of computational architecture. This project attempts to create immersive experiences that cross the boundaries between art and technology, taking inspiration from Zaha Hadid's innovative architectural designs. The project aims to produce visualisations that not only attract viewers but also generate a sense of architectural marvelry through the use of TouchDesigner's point cloud technique.

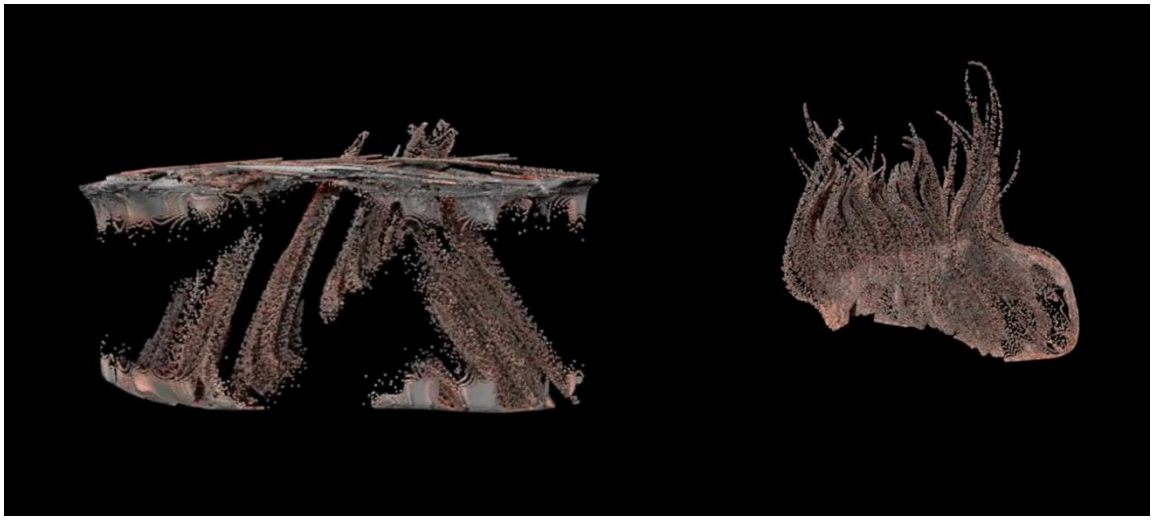
Idea and Background Study: The idea for parametric point clouds was inspired by the goal of fusing computational design principles with the visual appeal of architecture. Because of its parametric character, future viewpoint, and organic forms, Zaha Hadid's work is a major source of inspiration. Hadid frequently uses intricate geometry and flowing forms in her architecture, which challenges preconceived ideas about form and space. The project aims to replicate the intricate details of her designs by examining her design philosophy and investigating the possibilities of computational technologies in producing visually arresting architectural compositions.



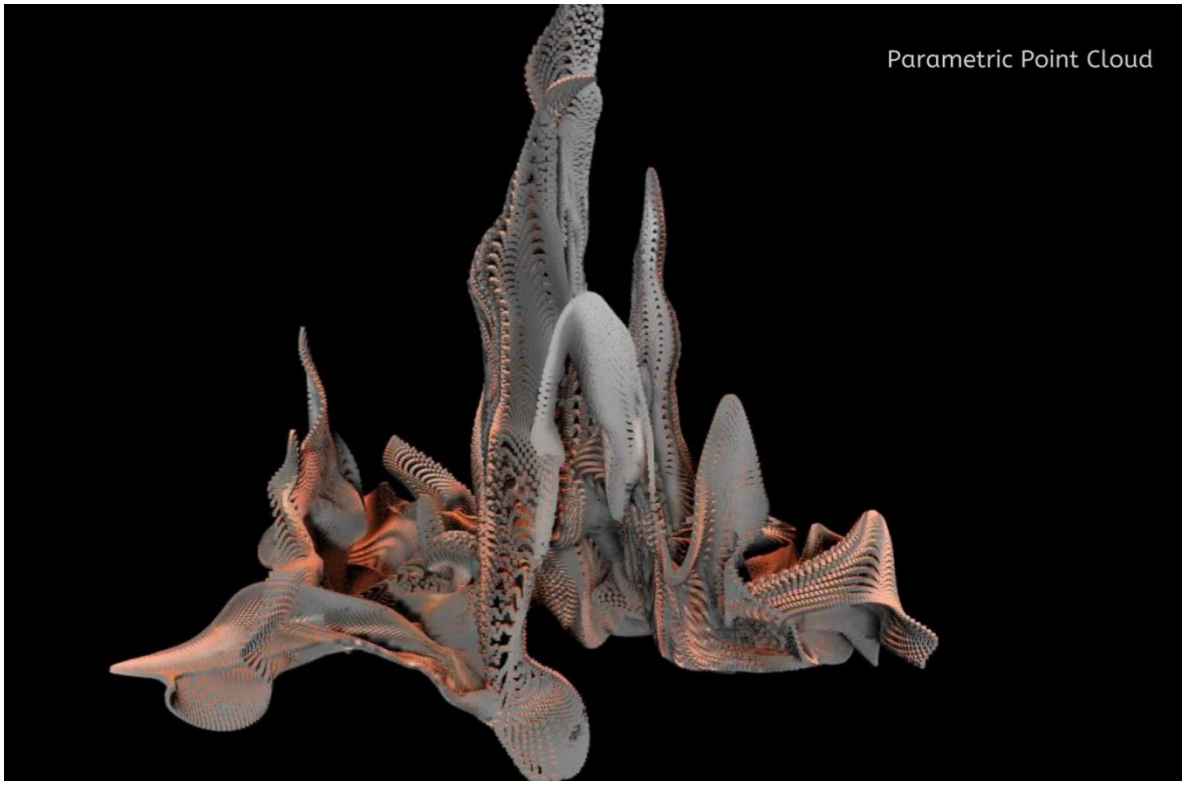
Iterations process images – Point cloud

Technical Implementation: To create dynamic visualisations and modify point cloud data, TouchDesigner's features are utilised in the technical implementation of parametric point clouds.

The project turns abstract data points into concrete architectural forms using a number of unique scripts and textures, giving the viewer an immersive experience. The created designs' visual impact can be further enhanced by applying textures and lighting effects, which are made possible through the usage of simulators.



Iterations process images – Point cloud
Video Link: https://vimeo.com/manage/videos/940828672/privacy



Final Output – Final iteration
Video Link : https://vimeo.com/manage/videos/940828672/privacy

Thoughts and Future Directions: The creation of parametric point clouds has shed light on the relationship between architecture, technology, and the arts. The project effectively illustrates how computational techniques may be used to realise intricate design concepts and expand the realm of creativity. In order to provide even more dynamic and engrossing images, subsequent iterations of the project might investigate sophisticated procedural generation and real-time rendering approaches. Additionally, working with designers and architects may result in the use of actual architectural data, giving the created designs a more realistic feel.

Citations:

Zaha Hadid. "Parametricism: A New Global Style for Architecture and Urban Design." 2009, vol. 79, no. 4, Architecture Design, pp. 14–23.
Please visit https://docs.derivative.ca/TouchDesigner for TouchDesigner documentation.
ArchDaily, January 16, 2019, www.archdaily.com/909359/generative-design-form-finding-techniques-in-architecture. "Generative Design: Form-finding Techniques in Architecture."