

*Synesthesia* is truly a blending of the senses, both human and artificial. A tribute to the life of Wassily Kandinsky, *Synesthesia* embodies Kandinsky's philosophies on color, geometrical forms, spirituality, and the intimate connections between them. In his lifetime, Kandinsky's own experiences being able to "hear" colors and his intense study of the emotional impacts of geometric forms led him to create some of the most provocative and visually profound works of art of the early 20th century. *Synesthesia* builds on these philosophies and extends them beyond the senses and geometry that we as humans experience and blend them with the complex geometry and sensory perception of artificial intelligence.

Kandinsky's art, particularly that of his Bauhaus period, emphasizes points, lines, and their geometric relation. Kandinsky's fascination with geometric forms led to his seminal work, *Point and Line to Plane*. This thesis expounded on Kandinsky's philosophy concerning the emotive properties of points, lines and planes. In it, Kandinsky describes how each of these 2-dimensional properties could be modified in order to alter the inner state of the viewer. *Synesthesia* advances upon this theory and embeds Kandinsky's own life work into a higher-dimensional canvas and derives separation between points, lines, and hyperplanes, each representing a dimension of Kandinsky's work. To do this, *Synesthesia's* canvas is created by training a Support Vector Machine with a high-dimensional kernel. A sample of Kandinsky's work throughout his life is fed into the model, along with the period of his artistic life that each work was created in. Some of Kandinsky's most famous works, including *The Blue Rider* from his early artistic period, *Composition IV* from his *Der Blaue Reiter* phase, *Untitled 1916* from his stint in Russia, and *Composition 8, 1923* from his Bauhaus era are all embedded into a higher-dimensional representation. During the training process, the Support Vector Machine finds the optimal separating hyperplane between these periods of Kandinsky's life and learns the various transformations that mirror Kandinsky's own stylistic rebirths. This higher-dimensional representation of Kandinsky's life's work is then brought back into our visual scope as a 2-dimensional decision boundary, each point representing an embedding of Kandinsky's works into this space and the planes representing the eras in which these works were created. This is the canvas for *Synesthesia*.

Once the canvas of Kandinsky's life is prepared, we begin the process of amalgamating the human perceptual system with that of artificial intelligence. This process begins with a Neural Style Transfer model, which is a deep neural network trained to separate the stylistic components of a work with its geometric forms and to transfer those, as the name suggests, to new works of art. The necessary components of this transfer are a canvas to transfer to – which is described above – and an image to take the style of. What better work than *Transverse Lines (1923)*, painted just as Kandinsky began working on *Point and Line to Plane*? In *Transverse Lines*, Kandinsky studies the properties of intersection. Just as new forms are created upon the intersection of lines, so too are new forms created when artificial intelligence and human art intersect. The result is *Synesthesia*, a blending of senses and geometric forms formed at the confluence of humanity and artificial intelligence.

Though *Synesthesia* is generated from two abstract forms, it is difficult not to see anthropomorphic elements strewn throughout the plane. When gazed upon from different angles, hints of faces may appear, obscured by the multi-layered perspectives that shift at every glance. Despite the canvas being generated entirely from the high-dimensional representations of pixel data, *Synesthesia* retains key components of Kandinsky's work, while still being wholly different than anything Kandinsky conceived during his life. It is not difficult to imagine that a Kandinsky who lived to see the work of Pollock and Lichtenstein may have evolved his perspective to create such a work. Regardless, this work represents a true blending of humanity

and artificial intelligence, and carries forth the theoretical and artistic thesis of the father of abstractions, Wassily Kandinsky.