YOUNG AE KIM
806 W. MAIN ST. VERMILLION, SD 57069
http://www.YOUNGAEKIM.com
IMAGINEYOUNG@hotmail.com
1.912.2204547{cell}

RESEARCH STATEMENT

My research interests have revolved in contributing to a deeper understanding how individual decision-making influences visualization & information receiving process in both digital and physical environment, and vice versa. Human Behavior is often influenced by numerous factors and processes information differently. I employ scientific data to sculpt visual components, develop survey tools, and analyze data sets to better understand human behavior and emotion play in visual perception and decision-making process in order to create a sustainable knowledge and a sustainable visual commutation forms and proposes brighter possibilities of whole lifestyles.

Followings are research areas that I have explored so far and brief explanations:

IMPERFECT BEAUTY: Human Visual Perception play in "Accurate/Absolute" form

In a world where people see, process and remember information differently, questions about beauty arise: What is real beauty? How do we determine what true beauty is? Can the disciplines of mathematics or physics, for example, help us arrive at a definition, and can we believe their answers? Perfect beauty has been defined in many different ways by many different academics such as physicists, psychologists and mathematicians. They analyze divergent ideas of beauty to try to find out why people perceive things to be beautiful or not. In the process they develop theories that manipulate our thinking about ideas of beauty and our viewpoints about beauty.

Many thinkers have tried to find absolute definitions. For example, they have devised ways to relate the human form and the natural form to the mathematical ideals of proportional "beauty." Alberti, a philosopher, believed that "beauty is a kind of harmony and concord of all the parts to form a whole which is constructed according to a fixed number, and a certain relation and order, as symmetry, the highest and most perfect law of nature, demands." We have since come to recognize that this kind of effort is a rather futile attempt at codifying our understanding of visual perception within the physical realm, yet it consoles us. They have been defining proportions based on mathematical principles, such as the Golden Section, the Fibonacci series, etc. It is not difficult to figure out that these numbers are not absolute numbers. "The three dots after the numbers indicate that these numbers are 'irrational,' so called because they can only be approximated, never expressed fully." (Doczi,5)

Highly educated people have tried for centuries to define beauty, but they have not been able to find an absolute definition even though they spend their whole lives analyzing it. Is it possible to perceive anything, including beauty, without preconceptions? In other words, is it possible to explain beauty in absolute terms? It is a challenge to define beauty, as we shall see. We perceive things based on our own individual past experiences, education, knowledge and judgments taught to us by teachers and society. Even philosophers have tried to find ideal beauty. Aristotle, for example, stated that beauty could be achieved in the form of a well-made artifact or artwork, whether it is a candelabra or the creation of the universe by God. However, how do we define something that is well made? Even the idea of "well-made" is relative. It is a justification given by humanity and human longing.

Using the principles of symmetry found in the study of physics (including entropy), mathematics and Gestalt theory, I investigated human perception to see how it determines the idea of beauty. I examined various measurement systems that were developed to find perfect proportions, and/or, perfect beauty. Despite varying definitions of beauty, these theorists thought that they could devise a kind of formula for creating absolute beauty; a universal definition. This thesis not only focuses on reconsidering what we believe beauty is and understanding how beauty is perceived and defined, but also understanding visual perceptions.

ASSOCIATED AREA OF STUDY
| Symmetry in Mathematics, physics, and Chaos | Universal Design | Human Memory & Perception |
| Learning Style | Cognitive Psychology | Gestalt Principles | System Design | Visual Illusion |

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DESIGN FOR TOUCH: Human Emotion play in the User-Centered Design

The Discipline of design has been undergoing dramatic changes for decades and it shows no signs of slowing. The overall landscape of design has shifted to new digital devices, and professionals rarely focus exclusively on printed material. Technology has inspired rapidly changing elements of our culture, and society is now demanding specialization in fields such as service and interactive design.

People who are fluent in the current language of design are demanding qualities that are reflective and meaningful in this evolving technological world. We have been looking for ages at design in an era of branding in a very top-down way, focusing on positioning and the brand itself with maximum use of technologies, rather than on emotional connections and involvement. It is about much more than being top of mind or focusing on benefits and core values. It's about perceived emotional values by the social and human corporate ecosystem that consists of people. J-P Clerck, digital marketing consultant, said, "Today, a human approach that goes beyond openness, personality, personalization and transparency is a must, as engagement rules and brands become dynamic, defined by their touch points, interactions and emotional connections."

We, as a designer, must realize that graphic design isn't only focused on typography anymore. In the traditional design structures, users will be expereienced irrelevant methods and techniques. In addition, scholarly design research has not been able to evolve at the pace necessary in our current culture. This change is no longer a matter of choice, due to the significant shifts occurring in communication design; critical changes need to be made in the design process.

The focus of this research is to consider how cultural shifts have led designers and educators to a point of essential change, how we are supposed to translate different media influences in design experience in order to the best meet challenges facing our world. I have exanimated how humanization of user experiences/customer experiences and interaction can be translated in personalized processes by creating design products and changing display environment with similar products.

ASSOCIATED AREA OF STUDY
| Cognitive Semiotics | Sociology | Language and Culture | Learning Style | Cognitive Psychology |
| Social Ecology | Circle of Sustainability | Structural Functionalism |

MEMORABLE DATA VISUALIZATION: Human Memory play in the era of Big Data

The era we all facing is the era of Big Data. In fact, the new availability is huge amounts of data offers a new way of understanding the world. I spend many times reading scientific papers and wonder, when I walk away from my desk, what am I going to remember? Which figures and visualization in these papers are going to stick with me?

Science is pleasurable activity that plays with ideas; they are imagining and creating new situations as well as observing and predicting of real world phenomena. Scientists use their imagination before they design their experiments and they have to communicate their findings in a number of different ways. Scientists uses metaphor in writing, scientific journals, and lectures to present the ideas more accessible. Moreover, pioneering science provides important habitat for our daily lives within public support among the highest levels of understanding importance and active participation. However, the distance between scientific findings and its communication/interpretation has been always issues. Then, what would be the best way to communicate and interpret complex information to memorize them possibly applying into our daily lives and saving people's lives?

Images engage us in ways that words cannot. Explanatory graphics can clarify or strengthen an argument by guiding us through data or concepts. Exploratory graphics draw us into the research process, allowing us to discover patterns and relationships ourselves. Visual representations have long been a significant part of any scientist's research. The research community is primarily responsible for crafting its own graphics – and yet the typical researcher's training rarely includes the development of such skills and sensibilities.

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A visualization will be instantly and overwhelmingly more memorable if it incorporates an image of a human-recognizable object—if it includes a photograph, people, cartoons, logos—any component that is not just an abstract data visualization. A graphic with one of those components, that is the most dominate thing that affects the memorability. Visualizations that were visually dense proved memorable, as did those that used many colors. Any visual information with human-centric scenes is even easier to remember.

The visualization needs specific guidelines for 1) memorability, 2) accuracy, 3) easy to comprehend, 4) aesthetically pleasing, 5) appropriate to the context. Moreover, it is important to keep asking questions "what makes a visualization engaging? What makes it comprehensible? What makes data to be accessible and attractive forms? I have been investing relationship between human memory and visualization process, and trying to find the powerful intersection defining data accessibility to utilize into our daily lives.

FUTURE WORK

I will continue to in-depth study how human behavior encourages perceiving massive data with visualization. This collaboration research with chemistry department and Human Factor laboratory is growing into partnerships with more scientists, engineers, and doctors. The future trajectory of this research is aimed at introducing the efficient way of information interpretation through online communications. My research into this area has already enhanced learning in classrooms from University in London, United Kingdom, Seoul National University, Korea.

There are also plans with my co-authors at USD Chemistry to collaborate on his future projects. One particular interests us is outreach, which we both agreed that visual communication must come in to play that area. I would like to go further and in-depth in memorable data visualization with scientific data and expanding to all essential data that open brighter possibilities in our daily lives.

My research has been inspiring me how I, as a designer, take responsibility for the products that I designed in the market, and how design shapes our future. The design is the first signal of Human Intention. We must aware to the point where the products were made and purpose of product. Hence, I will continue trying to balance in between client-based work and research, because client-based work opens the opportunities expressing/demonstrating my research results to public and continues me connecting between my design work and users everyday in order to examine my works how it has shaped our lifestyle.