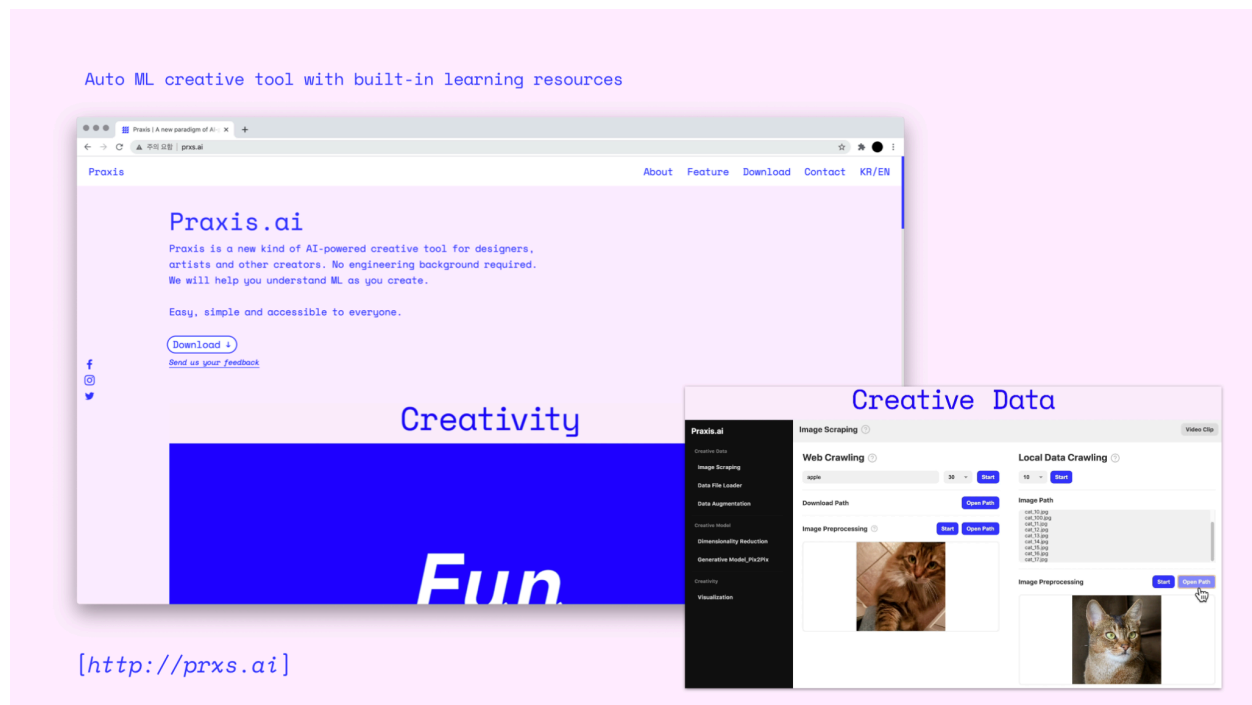


Sey Min

Media artist Sey Min explores data realism and the shifting dynamics of AI-dependent perception through digital data, starting with data visualization, Machine Intelligence visualization, and generative AI-based data visualization to understand ourselves and society. Her work has been featured in collaborations with numerous domestic and international companies including SKT, Intel USA, VICE, and Google. She has been showcased at TED 2011, TED Global 2012, Lift Asia, CNN Asia, the MOMA blog, and China's Artworld, among others. She has lectured at Sogang University, University of Seoul, Korea National University of Arts, Yonsei University, and Seoul National University's Graduate School of Convergence Science and Technology. Sey Min earned her M.F.A in Interactive Media from Pratt Institute and subsequently worked as an Urban Information Design researcher at MIT's Senseable City Lab. She was selected as a TED Fellow (2011) and Senior Fellow (2012, 2013). Her work has been exhibited at the National Museum of Modern and Contemporary Art ("Matrix", 2014), Media City Seoul Biennale ("Everyone's Artificial Intelligence", 2018), NeurIPS Machine Learning for Creativity and Design (2017, 2018), ZKM ("Mobile Traffic Data Visualization", 2019), and Google Art & Culture ("Climate Change Impact Filter", 2021). She served as an industry professor at Sogang University's Art & Technology Department for three years and was the artistic director of Seoul Light 2019, where she showcased AI-generated visual content through media façade. She also had launched Praxis.ai, an AI-based creative tool (2021). After serving as the 10th President of Gyeonggi Content Agency until 2023, she currently teaches AI Immersive Content at Hongik University and Cultural Content Planning at Kookmin University.



prxs.ai

Linktree : <https://linktr.ee/seymin>
Portfolio old site : www.ttoky.com
studio site : www.randomwalks.org (temporary closed)

selected talks :

[EN] <https://www.youtube.com/watch?v=n6qu4Xe9mWU>

[EN] <https://www.youtube.com/watch?v=oYzG-g9mYbk>

[EN] <https://www.youtube.com/watch?v=dHZQCCrm8iM>

selected writings :

[EN]

https://www.moma.org/explore/inside_out/2015/12/10/data-visualization-design-and-the-art-of-depicting-reality/

Publications:

[KR]

"AI and creators", <https://m.yes24.com/Goods/Detail/134229642>

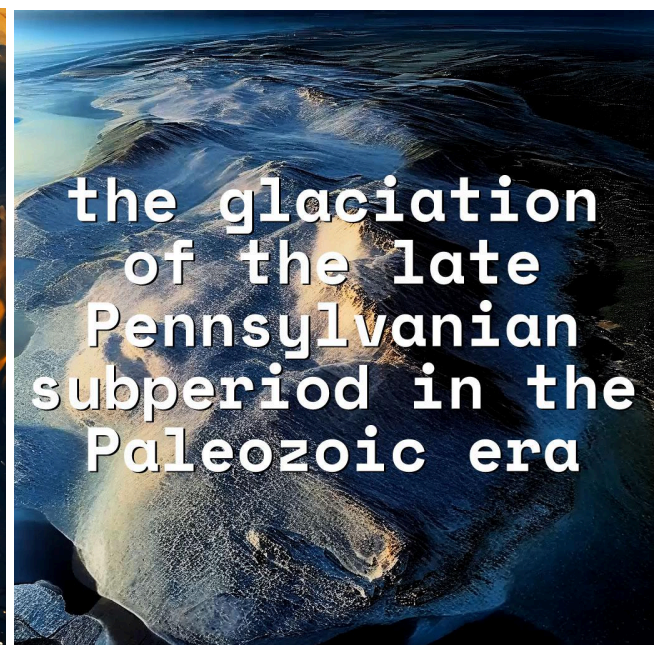
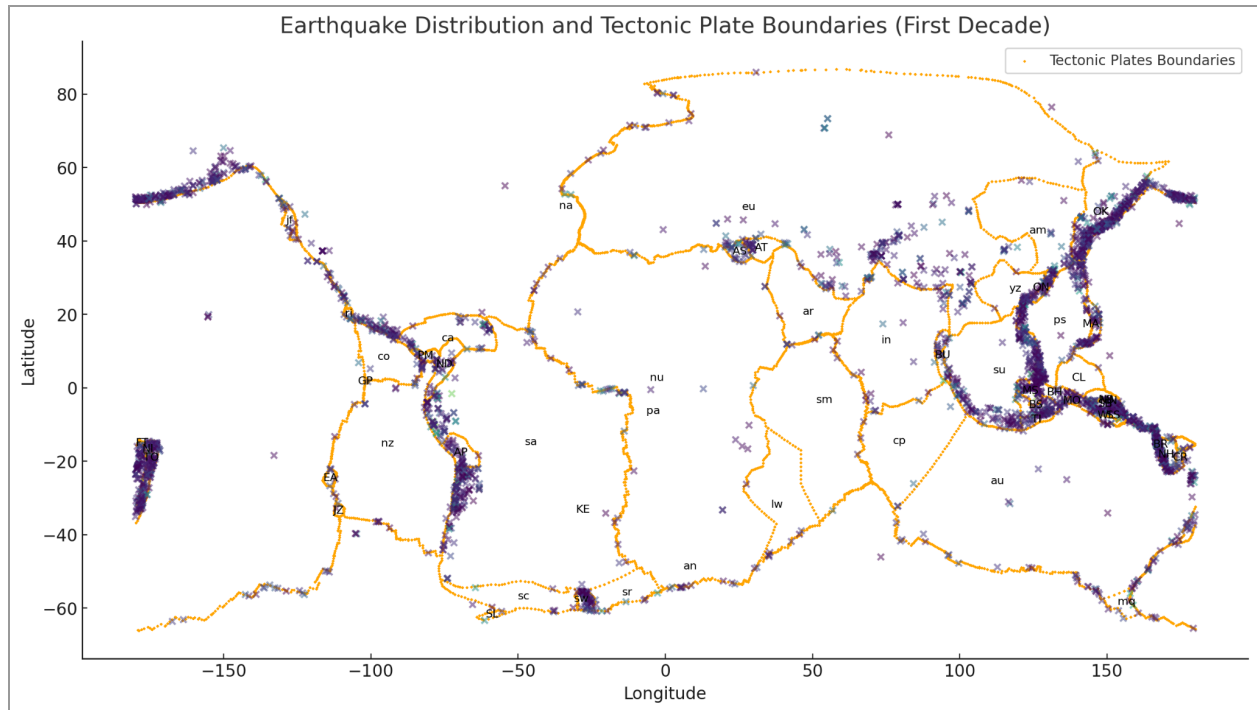
"RE:Spect", <https://m.yes24.com/Goods/Detail/140835422>

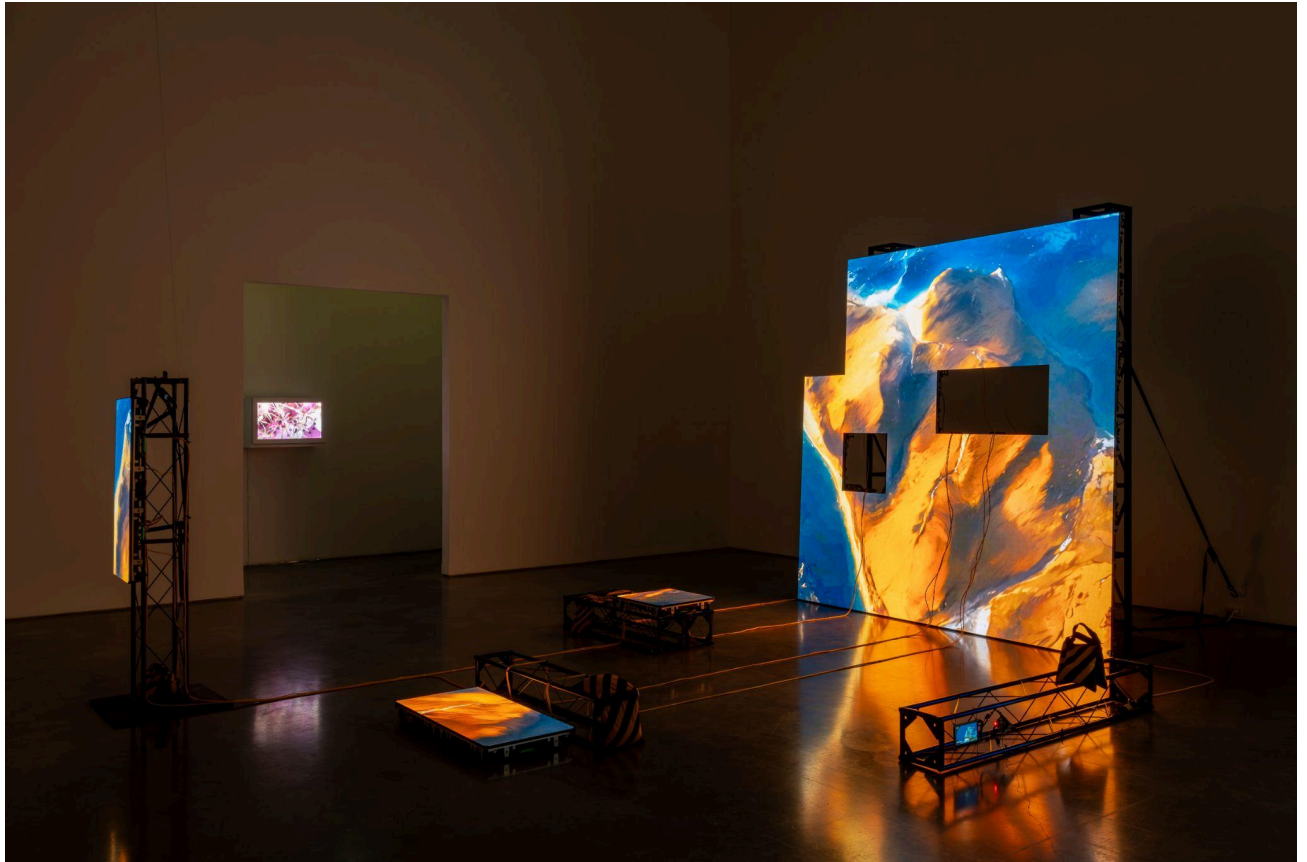
Selected work # 10 <tectonic movements(2024)>

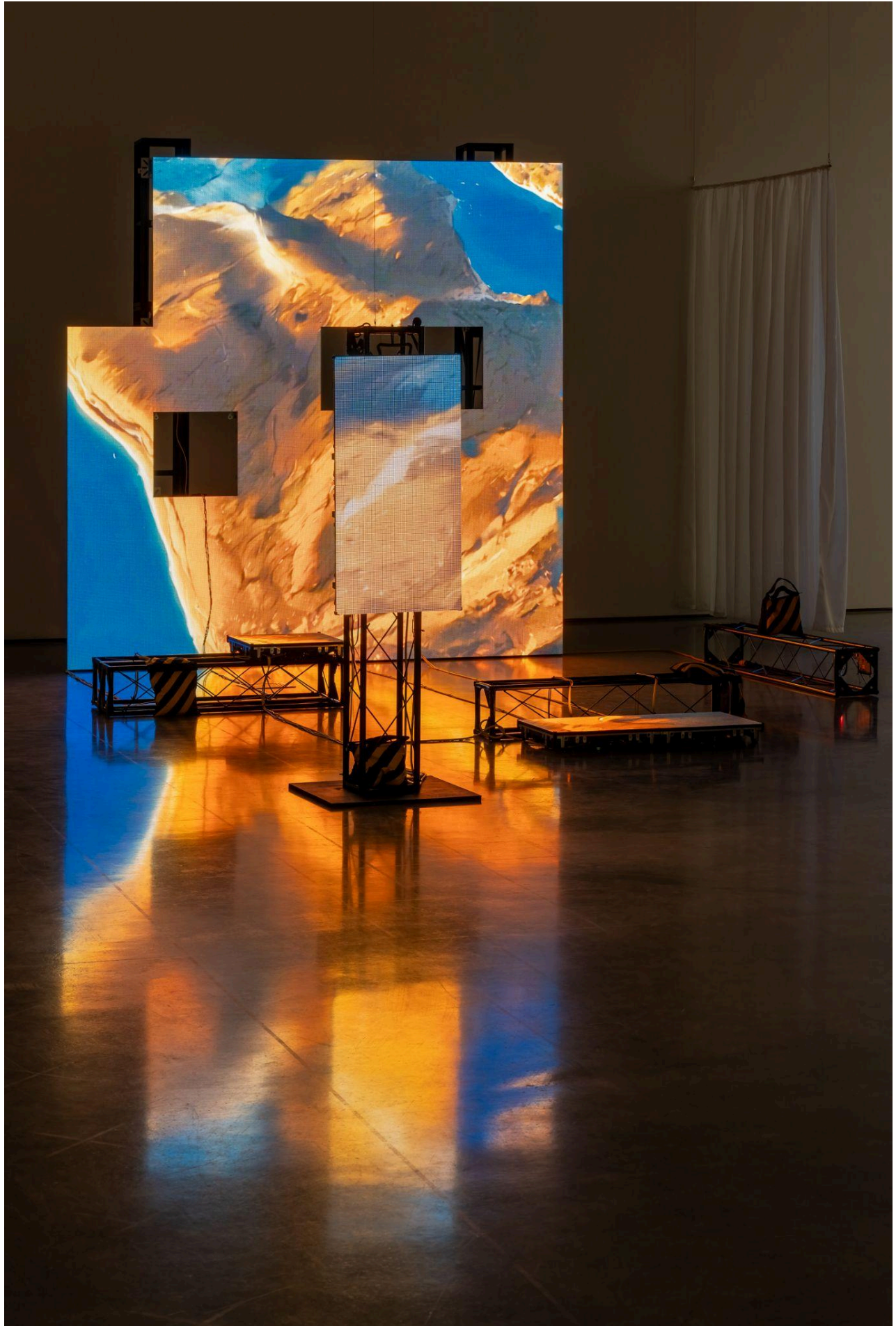
"Tectonic Movements (2024)" explores how AI accelerates the visualization of compressed geological time, allowing us to see Earth from both micro and macro perspectives. This artwork creates a new visual narrative by using generative artificial intelligence to visually reconstruct, reproduce, and distort geological facts, ranging from

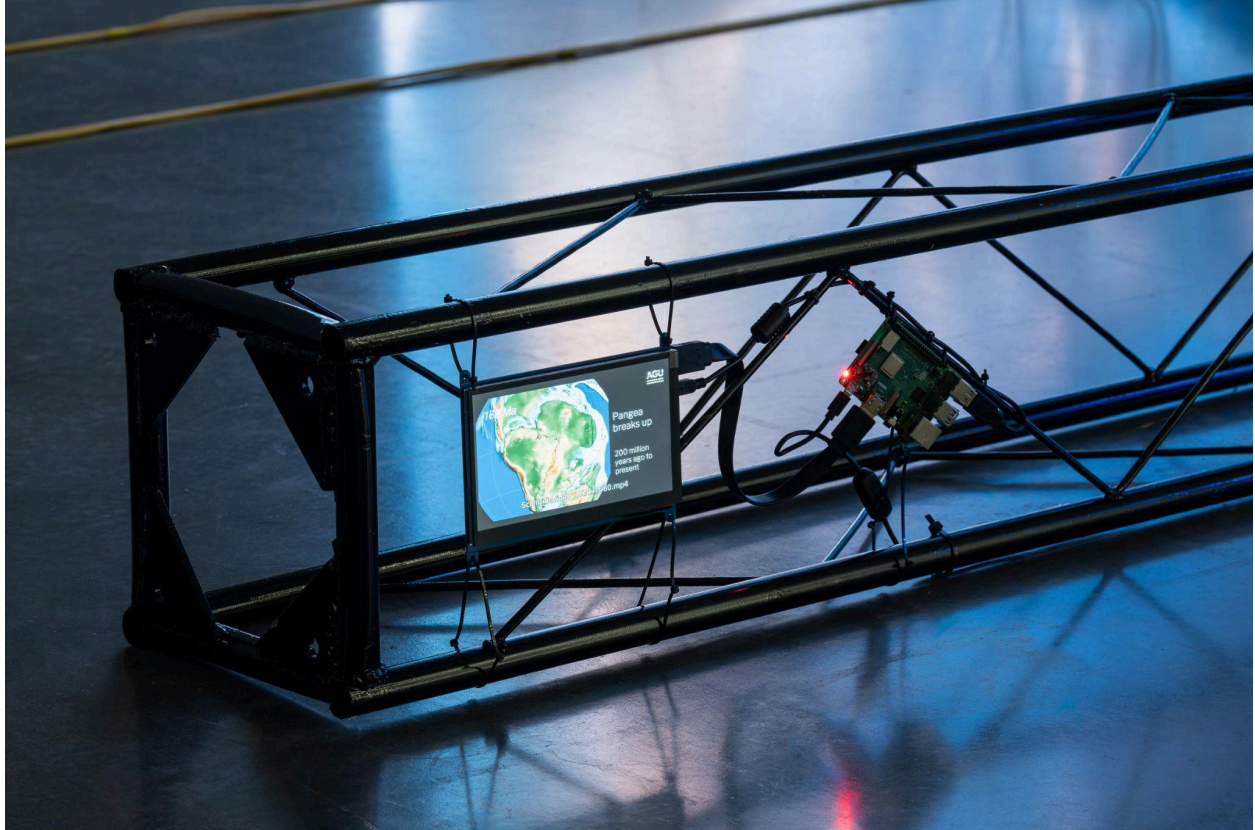
- 1) Pangea Breakup in the Jurassic period of the Mesozoic era.
- 2) the glaciation of the late Pennsylvanian subperiod in the Paleozoic era.

As part of the "NonFictioningFiction" series, this work demonstrates how scientific data and facts can evolve into artistic expressions through AI technology, blurring the boundaries between the objectivity of information and artistic imagination. In doing so, it poses a thought-provoking question to the audience: "Are we seeing facts, or are we experiencing creative distortion?"









Generation that Generates : as above, so below, Libby Leshgold Gallery, 2024

Selected work # 09 <Data Inference>

Data visualization transforms often-invisible facts into clear visual representations. While this method illuminates these truths, it also aims to minimize bias and ensure a more balanced perspective. In the 'Data Inference, *NonFictioningFiction*' project, visuals are not just direct translations of data. Instead, they are crafted through a machine inferencing system, blurring the lines between raw facts and their interpretations. This raises a compelling question: In the realm of machine-inferred visuals, where do we draw the line between fiction and non-fiction?

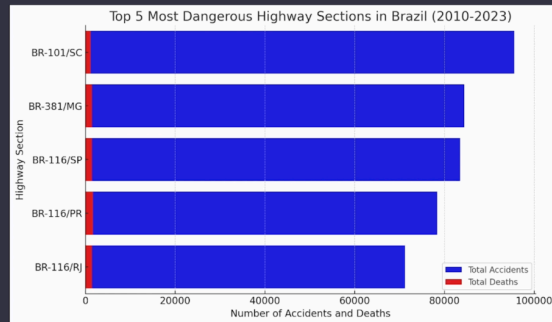
non- *Fiction* *ing*-데이터 추론, 사실과 왜곡의 경계 Fiction

Chapter 01. Brazil Total highway crashes 2010 - 2020

2010년 ~ 2023년 까지 브라질 고속도로 교통사고 데이터 분석

BR-101/SC는 가장 위험한 것으로 분석된 상위 5개 고속도로 구간 중 하나입니다. 이 그래프는 각 구간에서 발생한 총 사고 수와 총 사망자 수를 시각적으로 비교할 수 있게 해줄 것입니다.

그래프를 생성하겠습니다.



위 그래프는 2010년부터 2023년까지 브라질에서 가장 위험한 것으로 분석된 상위 5개 고속도로 구간의 사고 발생 빈도와 사망자 수를 보여줍니다. 각 구간에서의 사고 수(파란색 막대)와 사망자 수(빨간색 막대)를 비교할 수 있습니다.

이 그래프를 통해 특정 고속도로 구간에서의 사고 발생 빈도와 사망자 수 간의 관계를 시각적으로 이해할 수 있습니다. 추가로 필요한 분석이나 정보가 있으면 알려주세요. [?]

BR 101/ SC는 어떤 지역인가요?

ChatGPT can make mistakes. Consider checking important information.

BR 101/ Santa Catarina 구간

브라질 도로 사고 데이터에 따르면, **Santa Catarina**의 **BR-101** 고속도로는 심각한 부상과 사망자 수가 75 백분위수를 초과하는 고영향 사고의 중심지입니다. 이러한 사고는 후미 충돌부터 미끄럼과 넘어짐에 이르기까지 다양한 형태로 발생하며, 하루 중 또는 연중 어느 때나 발생할 수 있습니다. **BR-101**의 인적 영향의 중요성은 높은 교통량, 다양한 지리적 풍경, 그리고 주요 교통 동맥으로서의 경제적 중요성에서 비롯됩니다. 이 고속도로에서의 사고는 인간의 교통을 초래할 뿐만 아니라 더 넓은 사회적, 경제적 영향을 미치기 때문에, 도로 안전을 개선하기 위한 중요한 개입 및 개선 영역입니다.

BR-101/SC



BR-101/SC는 브라질의 산타카타리나 주를 가로지르는 주요 고속도로로, 높은 교통량과 아름다운 해안선을 따라 이어지는 길입니다. 이 구간은 특히 교통사고 발생률이 높아 위험한 것으로 알려져 있으며, 많은 사고가 치명적인 결과를 초래합니다. 사고의 대부분은 추돌 및 전복 사고로, 이로 인해 다수의 중대한 부상자와 사망자가 발생합니다. 또한, 이 지역은 복잡한 지형과 급격한 기상 변화로 인해 운전하기 어려운 조건을 가지고 있어, 특히 관광 시즌에는 사고 위험이 증가합니다.





Chapter 02. The Celestial objects near the sun

태양 근접의 지역 행성들 (gaiaDataNearSun)의 천체 위치 데이터



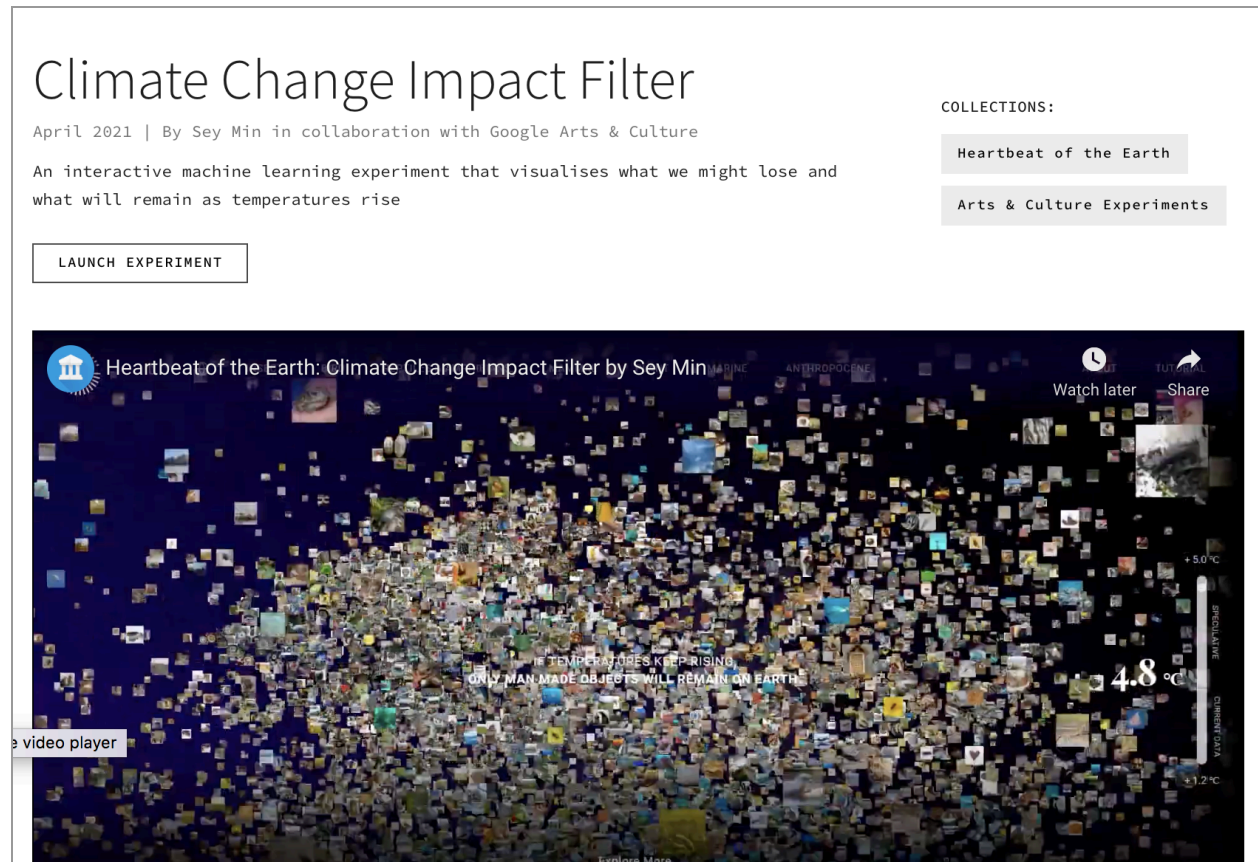
Data generates visual inference.

[video_KR] - *working on EN version*

<https://youtu.be/CwHbHV4JvKw>



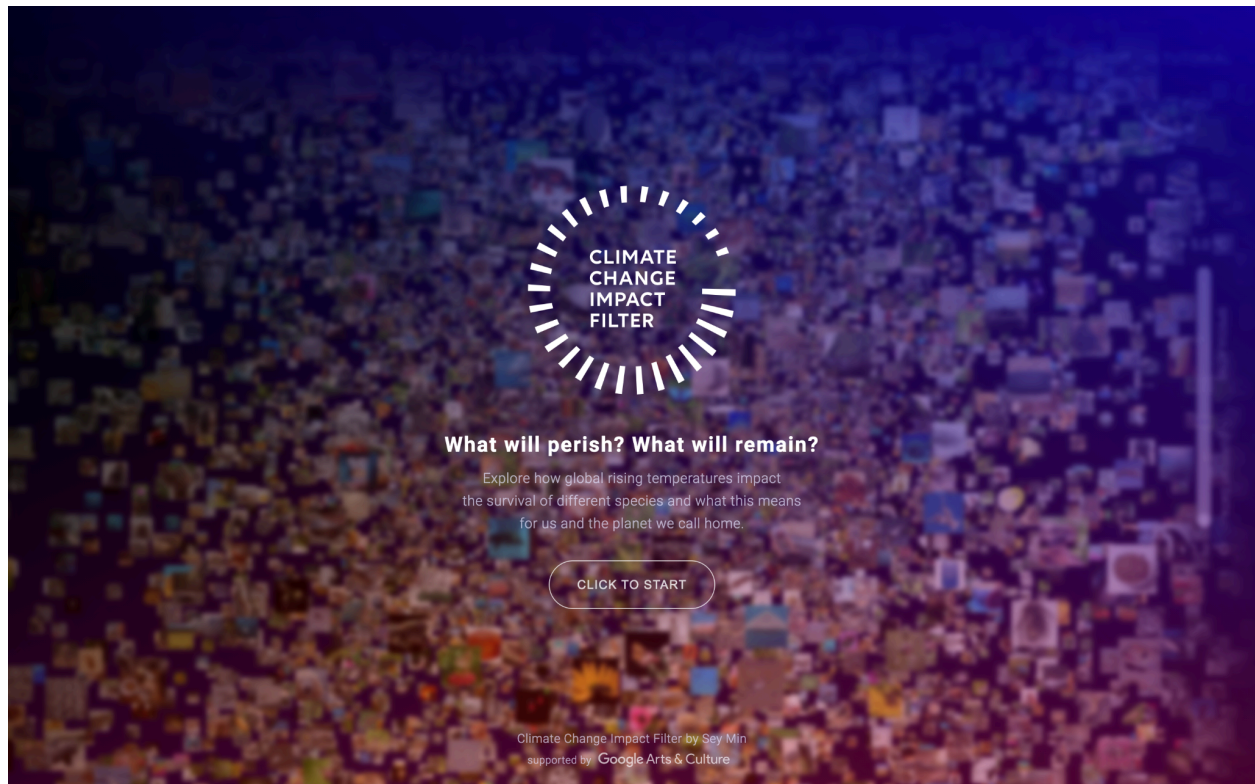
Selected work # 08 <CLIMATE CHANGE IMPACT FILTER>



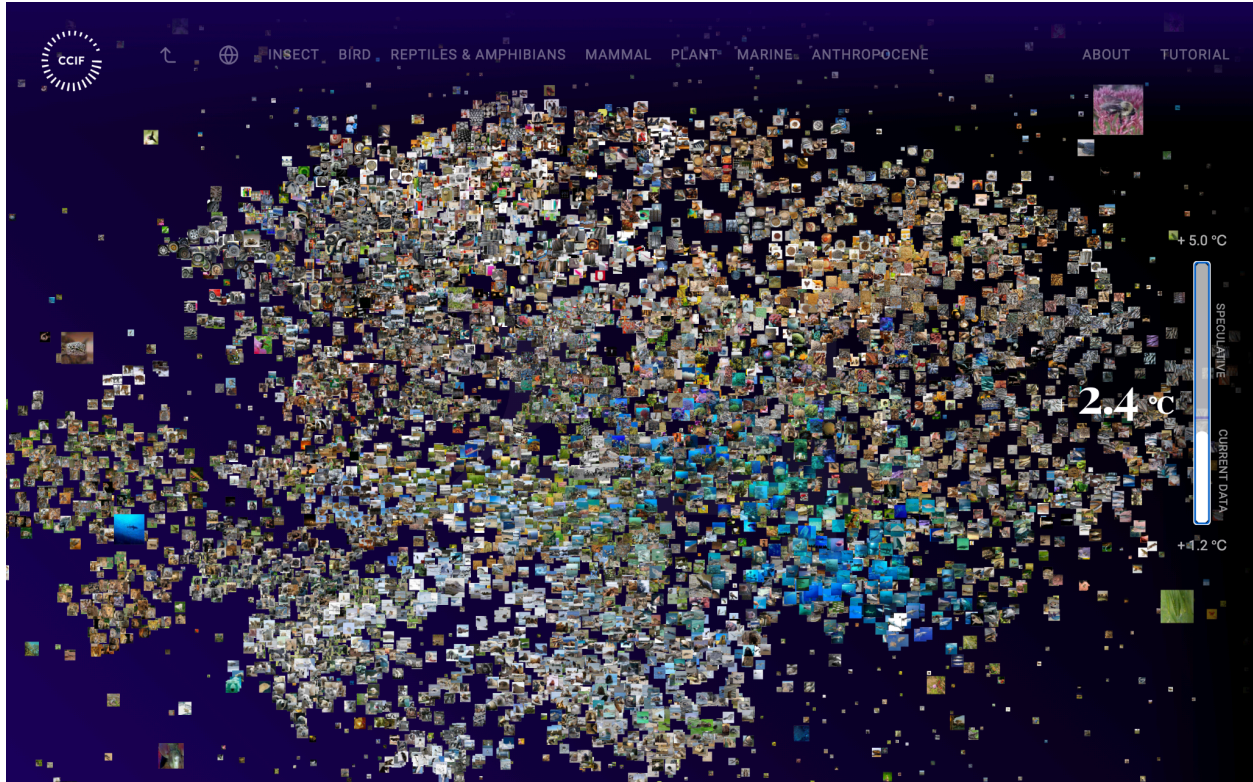
What will perish, what will remain?

Our earth is diverse and full of beauty that's worth protecting. But since the industrial revolution, our planet has warmed by 1.2 degrees. According to the UN's IPCC report, we must cut our CO2 emissions by 45% before 2030. Otherwise, we would risk losing the very elements that make our world habitable.

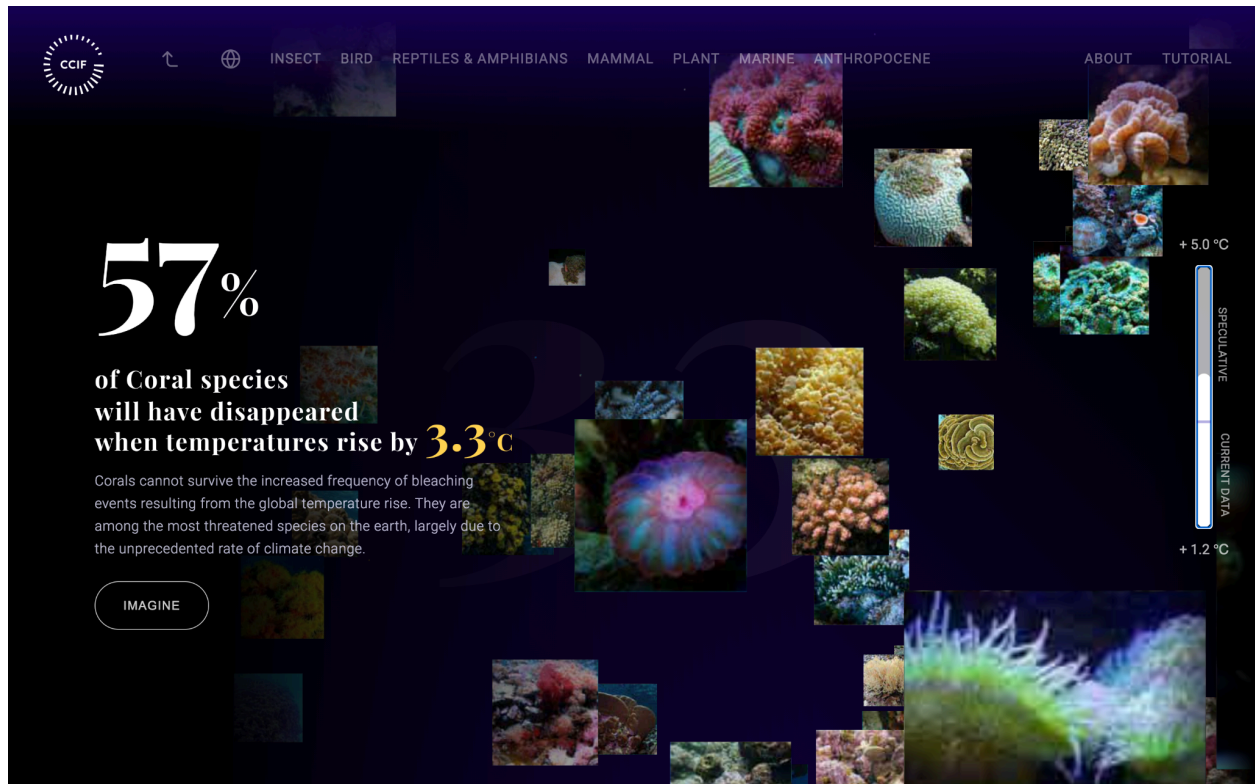
Using the Climate Change Impact Filter, let's witness how a temperature rise of 5 degrees impacts the survival of different species and what this means for us and the planet we call home. This project is supported by Google Art & Culture as part of a series of online artworks interpreting climate data. (<https://experiments.withgoogle.com/collection/heartbeat-earth>)



Climate Change Impact Filter” project shows the present and future of global warming. Images of foods, animals, plants, insects, and artificial objects on the screen mean “what we have now”. We selected species that are most affected by global warming based on scientific research. Images crawled from the Internet are shown by dimensionality reduction after feature analysis through an image classification model. A total of 12,288 images from 62 species of insects, birds, reptiles, mammals, plants, marine life, and anthropocene are clustered and disappear with changes in the global temperature. We know that mass extinctions caused by climate change are entirely due to human activity. From this perspective, the user control of the Earth temperature slider in this visualization represents human influence on nature.

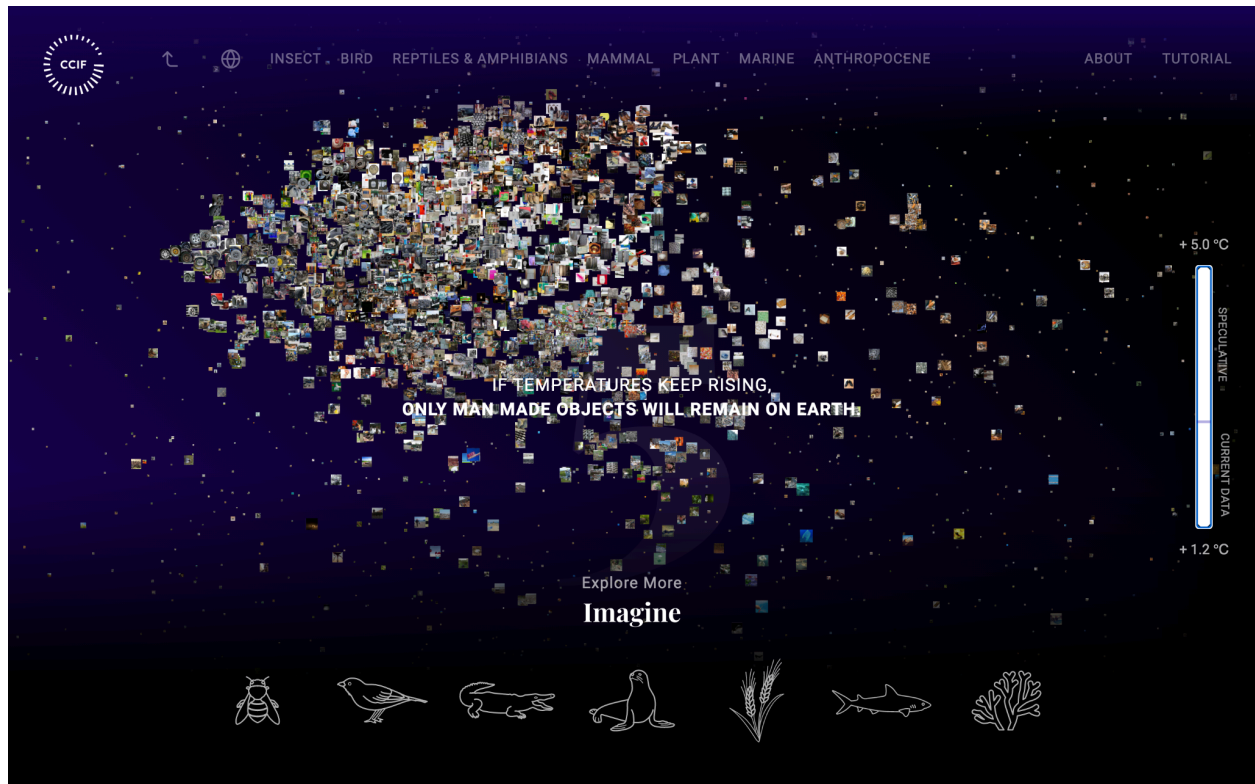


We might be aware of the importance of climate changes. We might also be aware of the seriousness of global warming. We, as civilized human beings, might be aware of polar bear starvings that melting glaciers affect. We are aware of the problem. Aren't we? If so, can you explain how climate change will destroy our daily lives? Can you describe what the picture of polar bears floating in melting seas means to our foods? Can you imagine national parks without forest birds?



Medias, researches and scholar papers about climate change warn us how fast our planet will be crushed. Some investigations suggest solutions to delay the time as much as we can, but honestly, many of us can not imagine how global temperature increase of 2.0 will change our ordinary lives and neighbors. For a closer understanding of climate change impacts, this project, “**Climate Change Impact Filter**_*things will disappear, things might remain on us*” shows what we might lose when sea level rises.

This visualization will show our current and the future. First, it will display foods, animals, plants, nature scenes and everyday objects on the screen. This visual means “**what we have now**”. The images will be crawled from flickrs, instagram or large image datasets such as imageNet or caltech 101. And at the bottom of the screen, the chain actions of climate change (temperature change, melting glaciers, sea level rise) will be shown to describe how global climate has changed since 1800. This is “**an evidence of happenings**”. And there will be a controller to change global temperature level from 1.5 to 2.0. According to a user’s temperature level changes, some of the images from “what we have now” will disappear. This shows “**impacts on our daily lives**”. The spots left by removed images will be filled with “**reasons**” in text.



Climate change is an urgent problem. According to IPCC's report (<https://www.vox.com/2018/10/8/17948832/climate-change-global-warming-un-ipcc-report>), we have just 12 years to limit devastating global warming. To drive our aggressive actions to prevent global warming, we need to understand how the problem affects our daily lives directly. I expect that this visualization will help increase our attention to climate change by showing loss.

[Experiments with google page]

<https://experiments.withgoogle.com/climate-impact-filter>

[Google story]

<https://artsandculture.google.com/story/39-climate-change-impact-filter-39-by-sey-min/DQXBRQWZwHII2A?hl=en>

[project documentation]

<https://sey-min.medium.com/climate-change-impact-filter-84f53d2a544c>

Selected work # 07 <A.I, entirely on us>

Since AlexNet won the ImageNet Large Scale Visual Recognition Challenge in 2012 by a large margin with a new algorithm called deep convolutional neural networks, machine learning technologies, a subset of AI (Artificial Intelligence) technologies, have been rapidly applied in a variety of fields. From the image captioning service that generates keywords of a given image or video to the storytelling machine that generates stories from a trained neural network model,

machine learning technologies have begun to influence our lives more than ever before. Moreover, Google's DeepDream project in 2015 brought new and intriguing insights of how machines learn in a neural network model and inspired many artists to implement the latest machine learning technologies into their creative works in a variety of forms of image, text, and audio. As such new AI technologies have been adopted by some pioneering creators, many new communities such as Artists and Machine Intelligence(AMI), creativeAI, AI experiments, PAIR, NeurIPS's Machine Learning for creativity and design workshop have also been formed to support sharing new ideas in the new fields of AI and creativity, which shows that the people in art and other creative fields are taking this new wave of technologies very seriously.

However, as more artists use machine learning into their creative works, some issues of profound importance such as diversity and fairness are being revealed as the central problems not only in technology communities but also in technology based creative fields.

Data-dependency is one prominent nature of the machine learning technologies differing from rule based systems. That is, the outputs of machine learning systems are totally dependent on the data used for training the learning system. This data-dependency could cause severe problems as demonstrated in the case of Microsoft's chatbot Tay trained based on Twitter data as a racist. Diversity issue may look less obvious than the above case, but ironically because of that, the issue is becoming more widespread and problematic. Lack of diversity in training data that does not consider minorities into account generates systems that amplify the social injustice existing in the real world. A lot of diversity issues are related to fairness issues, where accessibility to what is required to accomplish something is unfair. This particularly includes accesses to resources such as high performance computing power, big data, and advanced technological knowledges as well as general issues such as gender, race, ethnicity, language barrier, etc.

< A.I. *entirely on us*> was carried out as part of the 2018 Seoul Mediacity Biennale to investigate the diversity and fairness issues we are facing in the AI and creativity fields. "< A.I. *entirely on us*>" is a collaborative project and also a visualization work. This project started with the questions "*Can AI benefit the lives of all of us? If not, who can be in the group benefiting from it? How can we make AI a technology for all of us?*". This project attempts to find the answers to those questions by conducting a combination of an inquiry, ML (Machine Learning) based analysis, interactive visualization, exhibition, and discussion.

In the project, we invited thirteen of the world wide leading AI artists and researchers and exhibited not only their AI driven artworks but also their thoughts on 'AI driven society', 'Diversity and fairness', and 'Augmented intelligence' in the form of interactive art. We asked the invited artists and researchers twenty six questions from the three subjects mentioned above via online before the Biennale. With their answers, we built a machine learning model to discover the keywords and the relationships among the answers, and shared the results in the form of interactive visualization to promote social discourses about the issues. This project concluded with the discussion about how we can make more inclusive culture in the area of AI and creativity.

-curatorial statement

Artificial Intelligence is a part of our lives. A.I speakers that are able to suggest movies don't surprise me anymore, and recommendation systems are getting so smart that they catch my preferences quicker than ever. As always, our lives are being influenced by and are influencing

to the advanced technologies. As always, we hope this most radical technology, A.I, that benefits our lives, to be entirely on us. However, what we are experiencing now is slightly different from our expectations. Instead of sensing mind blowing moments of A.I every single day, we now face an imbalance system: lack of minority groups data, diversity issues, and unbalanced accessibility. Some people say that AI stands for not only Artificial Intelligence, but also for Augmented Intelligence. In this point of view, who's intelligence can be augmented by AI? Can this technology enhance the abilities of all of us? If not, who can be in the group of "all"? Are you one of the "all"? I started this project to reveal questions, problems, and issues in the age of A.I. that came up to our minds.

Entirely beneficial state might be ideal. It can not turn into a reality under any circumstances, and it can not be achieved in any society. However, still, that is the value we should keep pursuing for a better life. Can AI be for 'all'? Is it entirely on us?



<A.I., entirely on us> at the 2018 Seoul Mediacity Biennale. Viewers can interact with the visualization of the thoughts of the participants. (© Seoul Mediacity Biennale 2018, Photo: Cheol Ki Hong)



The 2018 Seoul Mediacity Biennale. (© Seoul Mediacity Biennale 2018, Photo: Cheol Ki Hong)

Participants

Gene Kogan, Mike Tyka, Shinseungback Kimyonghun, Oscar Sharp & Ross Goodwin, David Ha, Mario Klingemann, Scott Kelly and Ben Polkinghorne, Lauren McCarthy, Lubba Elliot, Seung Joon Choi, Jihoon Jeong, Seungil Kim, and Sey Min.

Data Collection

We asked the participants three sets of questions. Each set of questions is related to each subject: 'AI driven society', 'diversity and fairness', and 'augmented intelligence'. The complete question sets are accessible at <http://www.ttoky.com/aiOnUs/questions.html>

The first question set on 'AI driven society' focuses on general understandings of the machine learning technologies in creative practices. The respondents shared what they have experienced while applying the advanced technologies into their creative works. One main question we asked under this subject is *"Did you have any specific struggling point while working on AI driven projects?"*.

The second question set on 'diversity and fairness' dives deeper into the problems that we are primarily interested in. The issue of diversity and fairness is related to all areas where AI is applied to. However, we focused on the issues only within the creative practice. Some of the questions we asked are *"What are the 'diversity' and 'fairness' issues you have experienced in art and technology?"*, *"Have you taken any actions to reduce the imbalance or unfairness?"*, and *"What actions or resources do you think we need to solve the issues?"*.

We received total one hundred forty one answers through Google forms. All the questions and answers are available online as a PDF file at http://www.ttoky.com/AI_on_Us.pdf in both English (from page 28) and Korean. (from page 1)

[illegible]

The visualization, <A.I., *entirely on us*>, web interactive media, 2018. (© Sey Min, Photo: Sey Min)

"For all". It's a big word.
BTW, who are the
"all"? This is the main
subject of this
exhibition. Do you
think

designer

robots

2015

robots / Michael Tyka_마이크 타이카
required, doable, predictable, consistent, surface, highly,
heterogeneous, regard, before, problem

I think the

"For all". It's a big word.
BTW, who are the
"all"? This is the main
subject of this
exhibition. Do you
think A.I can amplify all
of human intelligence if
anyone wants to do?
Do you think it's up to
personal decision? Or
even with many tries
and efforts, would only
certain groups can

"For all". It's a big word.
BTW, who are the
"all"? This is the main
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exhibition. Do you
think A.I can amplify
of human intelligence if
anyone wants to do?
Do you think it's up to
personal decision? Or
even with many tries
and efforts, would only
certain groups can get

planning

diversity

I think the current ML techniques are quite powerful in
expanding the scope of automation. Work that deals with a
more heterogeneous problem surface (like driving) are now
doable by robots, where as before robots required a highly
predictable and consistent problem surface (like in a car factory).

robots

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expanding the scope of automation. Work that deals with a
more heterogeneous problem surface (like driving) are now
doable by robots, where as before robots required a highly
predictable and consistent problem surface (like in a car factory).



On the visualization, <A.I., *entirely on us*>, once a user selects a keyword, the related information is visualized on the screen. (© Sey Min, Photo: Sey Min)

1. Analysis

The skip-gram architecture of word2vec was used for a model training, which allowed to map the tokenized words of the answers in space. As the result, a position of each word, as a vector, was defined in a relationship with other words only used within the answers. Another model was trained with tf-idf algorithm, which was used to extract identical words from each answer by comparing with the other answers. With the secondary model, each answer can have two keywords and with the first model, top 10 relative words belong to each keyword were determined. For the visualization, t-SNE algorithm was used for clustering, which generated a position of all the individual tokenized word in 2D space. Since the keywords would be used as interface, the visualization needs a data set of a keyword, a position of each keyword, top 10 relative words of each keyword, the answer belongs to, a person who answered for, and the original question of the answer. This data was saved as a JSON format.

2. Visualization

Users can interact with this web based visualization by a mouse. They can click to select a word for investigation and scroll up/down to view overflowing content related to the selected word. When there is no user interactions, users view constantly changing sets of words positioned and moved on a screen in interesting ways. When an user selects a keyword of his/her interest, the visualization system performs a series of actions. First, it rearranges other words around the selected one according to their proximity to the selected keyword based on the t-SNE output. Second, it shows the answer corresponding to the keyword with the respondent name and also top ten other closest keywords. Lastly, it displays the related question with more visual emphasis than others, which is designed to encourage users to ask themselves the same question while experiencing this system. When there is no user interaction for a certain period of time, it goes back to the idle mode.

Audience Response

A total of about 66,000 visitors visited during the exhibition. As the final task, we held a public discussion, where the public and the artists participating in the project met, exchanged ideas, and discussed about how to improve the current state.

The issues of gender and racial diversity in particular have been discussed more. One audience pointed out that the fact that the AI home speaker is mostly set as a female character is solidifying the woman as a secretary role in the society. Another audience also pointed out that the development of AI led by white men is further amplifying the white supremacy. To those comments, one panelist pointed out that there is always a tight tension between considering diversity and fairness and making the product sell, while another panelist pointed out that the gender and race issues are not from the flaws of AI technologies, but from the humans who train them, emphasizing the responsibilities of humans in solving the issues. The fact that most of the participants in this project were white men was also pointed out by one audience, and it ironically shows the current biased state of the technology driven ecosystem.

In addition, there has been a discussion about how to make this technology easier for more people to learn and apply to their own creative practices. As a ML artist and educator, a participant told that people in this field are constantly developing easier tools and learning materials so that more people can use it without a computer science background and that these efforts must continue. Another artist acknowledged that learning AI technologies, which are being developed very quickly, is a very tough process. He suggested that one should start by playing with the technologies, try various things, and ultimately has to find his/her own ways of learning.



The panel discussion on diversity and fairness issues in the creative fields using AI. (© Seoul Mediacity Biennale 2018, Photo: Cheol Ki Hong)

<A.I., *entirely on us*>, which was carried out as part of the 2018 Seoul Mediacity Biennale, in order to investigate the diversity and fairness issue that we are facing in the creative fields using AI. We should not treat social problems such as diversity or fairness as secondary problems, as AI is rapidly evolving and is expected to affect more and more of society, including the arts. This project has gathered ones who are currently leading the AI and creativity field and provided a forum for them to form a consensus on the seriousness of the issues and contemplate how to improve the situation along with the general public through an inquiry, data analysis, interactive visualization, exhibition, and public discussion. Particularly, this project is the first attempt to collect the thoughts of the leading people in this field and analyze and share them with the public on the internet through interactive visualization. Of course, it is a limitation of this project that only a few people's opinions are considered. In the future, more efforts should be made to find interesting and various ways that make people pay attention to the issues and take actions toward more inclusive cultures, and continuous education will be at the core of the efforts. As with all other technologies, how artificial intelligence technology will change our lives will depend *entirely on us. really?*



<AI, entirely on us > exhibition

Interactive visualization in :KOJ <http://mediacityseoul.kr/aiOnUs>

Interactive visualization in:[EN] <http://www.ttoky.com/aiOnUs/>

Interactive visualization timelapse video : <https://vimeo.com/309681821>

Artist QnA PDF : https://www.ttoky.com/AI_on_Us.pdf

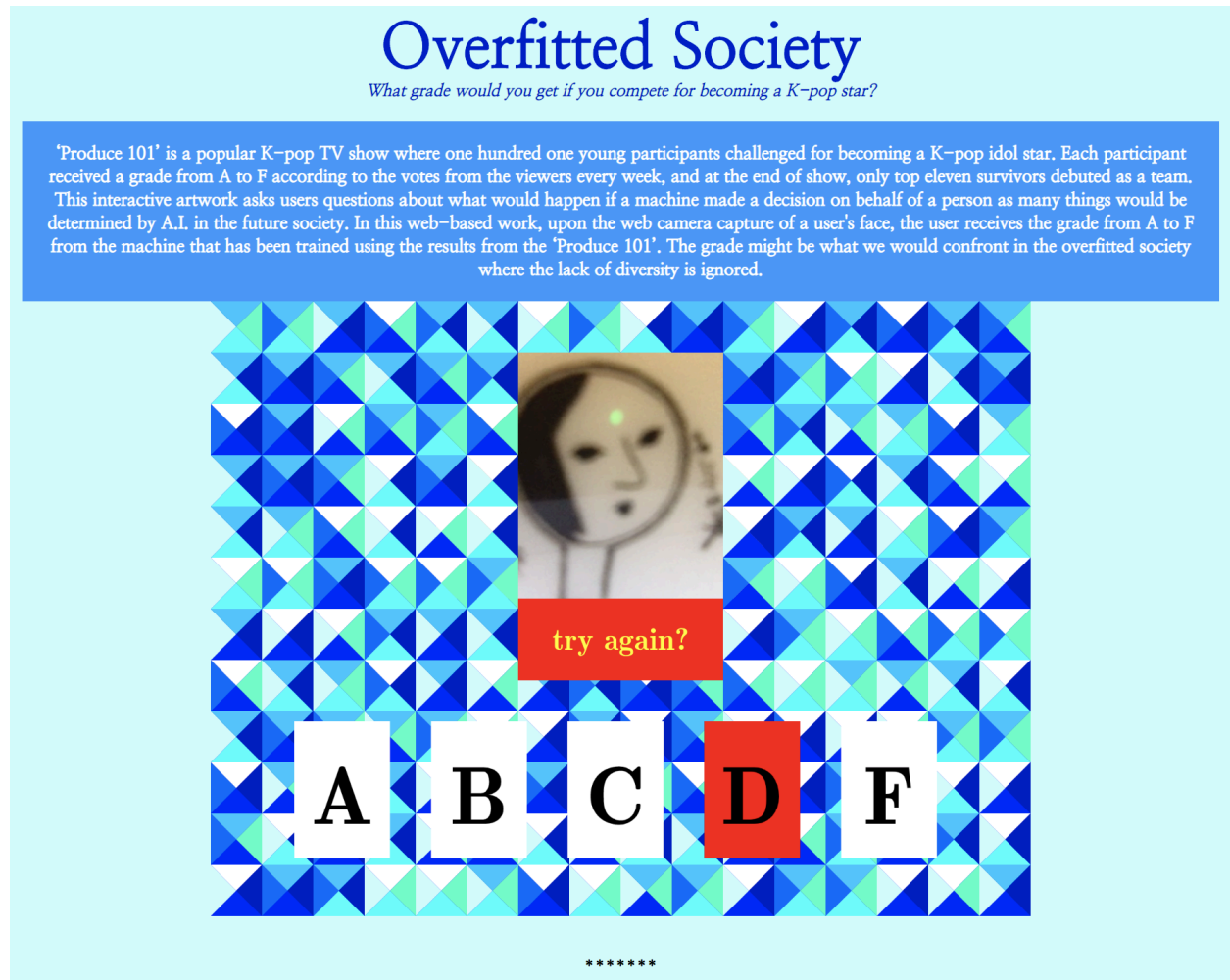
Selected work # 06 Overfitted Society

‘Produce 101’ is a popular K-pop TV show where one hundred one young participants challenged for becoming a K-pop idol star. Each participant received a grade from A to F according to the votes from the viewers every week, and at the end of show, only top ten survivors debuted as a team. This interactive artwork asks users questions about **what would happen if a machine made a decision on behalf of a person** as many things would be determined by A.I. in the future society. In this web-based work, upon the web camera capture of a user’s face, the user receives a grade from A to F from the machine that has been trained using the results from the ‘Produce 101’. The grade might be what we would confront in the overfitted society where the lack of diversity is ignored.

To train the model for classifying faces into the groups from A to F, we used around 200 pictures per group and total 882 pictures from the final results of ‘Produce 101’ season 2. *Since only male participants competed in the season 2, all the training data were male faces* Training was done using CNN algorithm with keras and tf.js with p5.js was used for the web based prediction . Of course, viewers select their favorite person not only on appearance, but on performances and attitudes as well. However, there is no doubt about how their physical charm is important in determining the preference. The training data clearly produced an overfitted model because of the lack of diverse data. But, this overfitted model lets us think about **what would happen if a machine trained without diversity made decisions**. With this project, we expect users to have fun getting grades on their appearance from the overfitted model, and also at the same

time, think about our social bias and how we can avoid the overfitted society where the lack of diversity is ignored.

This project has been accepted in NeurIPS Machine Learning for Creativity Workshop gallery, 2018.





Web version :

https://www.ttoky.com/produce_101/index_101.html

Credit / web publishing only

Phase_02 web version development (2018)

development : Sey Min, Jihyun Park, Youngjun Yoon, Dongkyu Kim

advisor : Jusub Kim & Sey Min

Phase_01 python version development (2017) by Project T

development : Sey Min, Jian Jang, Min-chul Kim, Miso Park, Tim Kim, Robin Han

advisor : Sey Min

Selected work # 05 *What if machines can see music....?* visualization of machines with imagination

With the recent developments of artificial Intelligence, the gap between machine and human intelligence is decreasing dramatically. With Strong AI, machines can perceive objects in images, generate specific styles of human voices, predict text after text with understanding of its context behind. As the results, people started to dream about the machines which think like human, but unlike their expectations, it is clear that machine interpretation is still different from human understanding. Especially in music, human express music in abstract ways, but machines take music in more analytic and data driven ways. Moreover, with AI, machines can understand music on higher level beyond time domain, which is more closer to multi feature dimensions. This project, *"What if machines can see music....?"* investigates how music would be looked like with machine' perspective. The visualization depicts similarities and relationships of many audio chunks from a single audio track. With this visual, viewers also can listen those audio chunks as connected via time series. Every audio file has different sonic events and feature distinctions. Therefore, with this visualization algorithm, each music file can have its own

form and figure. “What if machines can see music...?” project expresses visual aesthetics of machines analysis.

Can machines be creative? Yes, I guess.

Machines see the world differently, which we never have imagined before.

I believe this is a machine singularity that we don't have in human mind.

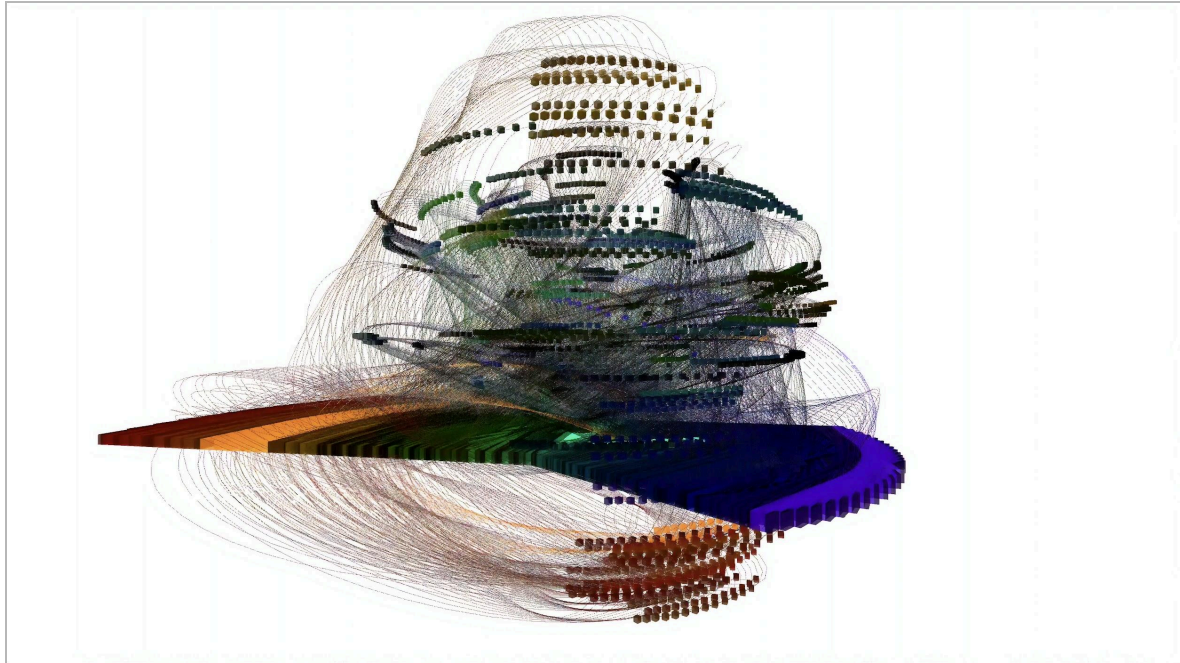
This project has been accepted in [NeurIPS Machine Learning for Creativity Workshop exhibition, 2017.](#)

[DATA]

1. As input, a single audio track (a song) into many audio chunks.
2. Those chunks happened according to the beginning of discrete sonic events in the input audio.
3. With librosa lib(mel-spectrogram), features are extracted from those audio chunks.
4. as result, 26 features from each chunk.
5. clustering those chunks via t-sne according to feature similarities

[visualization]

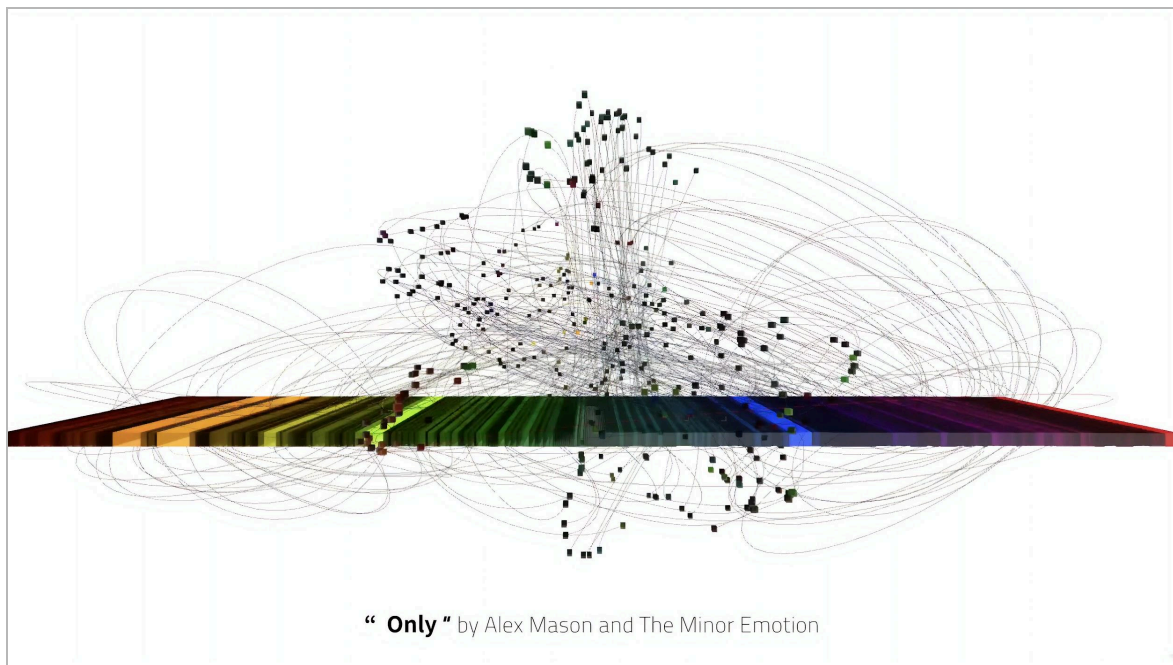
1. Visualizing high dimensional data in low dimensional space. 26 features of audio chunks in 3D space with t-sne.
2. Two tracks of visualization
 - 2-1) first track : as time order, all the chunks are shown at the bottom. The size of each box represents the length of the audio chunk.
 - 2-2) second track : place the audio chunks in 3D space according to its feature similarities with other chunks.
3. Sound : play each chunks according to its time order.
4. As result, every audio file can have its own form and shape.



[video : electronic music]

<https://www.youtube.com/watch?v=iv58cGv7B2k&feature=youtu.be>

Sound design by Kim Kate



“ Only ” by Alex Mason and The Minor Emotion

[video : classic music]

https://drive.google.com/file/d/1zye7WLiSdPjfWI5ZnYH_6Vqkey5k_IHX/view?usp=sharing

Selected work # 04 City DATA ; Seoul daily expenditure

Can public data describe our city?

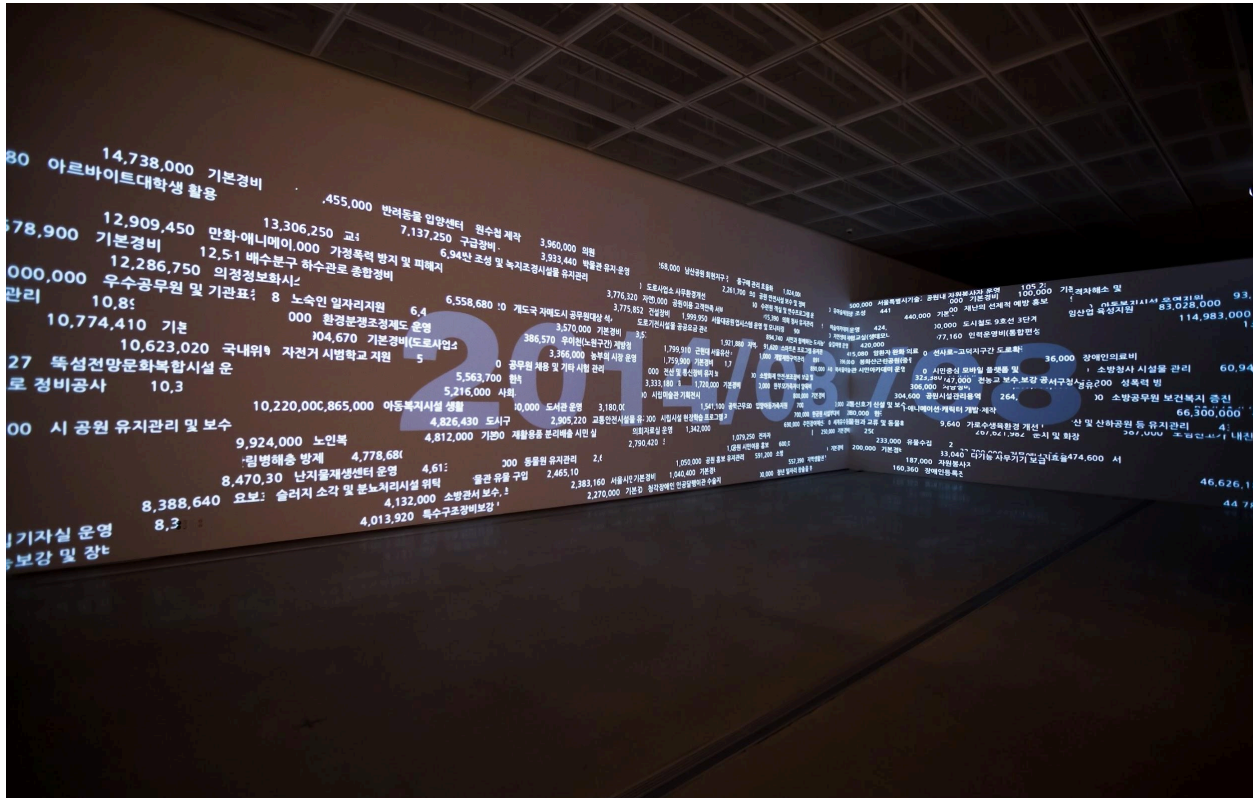
Data shows us a much bigger story than our naked eyes can grasp. Social networking sites tell us what we are interested in and who we are close to, even when we are unaware of such information ourselves. Public data raises our understanding of the cities and societies in which we live to an unprecedented level. Public transit data tells us about the movements and daily lives of our fellow urbanites, and also the state of the natural environment surrounding us today. Data may look like mere numbers, but it can reveal something truthful about us as individuals, as communities, and as societies.

Open To the Public? *Deliver to the public as comprehensible content.*

Due to open government data movement around the world, the Korean Government started to open its data to the public in 2010. As a result, large quantities of government data became available online from National Information Association (NIA) and Seoul Government websites. It is a fascinating step into becoming an open and transparent system. However, the general public is unaware of their accessibility to the data or even of its existence. Even with access, it can be difficult to understand.

Having said this, how can we make the public data comprehensible and more easily accessible?

0,000	조청교부금	79	338,480	대림 배수분구 하수관	43,069,000	정보화시스템원물재생센터 복개공원화(4	000	의회 청사 시설개선
49,4	의료급여사업	7,250,000	한강교량 일상유지보	1,100,590	119구급상황관리센터	17,727,000	시립미술관 2	308,000
28,275,917,380	인력운영	189,258,400	시 공원 유지관	1,937,490	인력운영비	41,	17,039,000	도로시설
24,685,298,000	의	167,875,301	서울	상봉공원(기존선릉공원) 부	16,907,140	자전거 시범	90	야생동물 증보전 연구
17,107,282,000	753,180,000	소년소녀가정 및 기	39,400,000	청소년 역	800	상설전시실 유지운영	7,578,520	친환경급수
15,994,151,531	지방채 상환(원)	0,000	전세보증금 순환기금 운용	거리노숙인 보호	38,	마곡산업단지 글로벌기업 유	7,500,000	친환경급수
0,000	보육돌봄서비스	51,234,230	한부모가족복지사업	1,870	인력운영비	37,	15,980,000	난지물재생센터
9,720,736,000	어린이	149,963,740	노후 도로3000	성북역 방치 및 피해자	하수관로 유지관리비	6,950,120	기본경비	4,000
98,000	어린이집 지원(보조)	5,563,690	슬러지 건조 및 분뇨	35,860,000	어린이 지역사회 일차의료 시범사업	4,000	여성폭력피해자 추가지원	14,000
5,306,600,000	IT COMP	129,493,200	지역아동	24,110	일반청비사업 추진	58,920	다문화가족 사회통	6,1
96,650	장애수당	2,76	427,000	사회적경제 인프	34,710,000	부조금여 지	30,000	박물관 유자운영
00	구일역사 성능개선사업	3,140,000	시설물 안전점검	공정하고 합리적인 인사관리	14,250,000	예코	6,671,710	행복플러스작업장 설
00	서남권 동야구장 건립	112,500,000	마을기업 육	16,680	차량정비사업 추진	14,043,530	이주여성	6,600,000
1,885,003,160	기초생활수	110,000,000	방음시설 설	28,516,620	신림4 배수	13,794,000	녹색서울시민위	5,431,000
1,561,320,000	충정로 중앙	10,000	동부간선도로(녹천	0	청춘극장 운영	28,3	13,750,000	500
1,241,522,000	친환경 무	15,000,000	재경비축진계4	28,116,900	기본경비	13,694,000	민생침해 근	6,300,800
7,687,540	노후포경도로	0,000	재활용사업자 육성자	26,632,000	관악산도사자	1,198,080	가로 신타마당 조성	5,600,000
노인돌봄 서비스	86,370	추진참여형 주거지	26,302,250	시립미술관 7	2,927,400	소방관서 보수, 보강	5,551,690	서울병원 고객
여 양육비 등	385,000	신원지하차도통	26,300,000	비열리	12,918,400	남산 및 산	544,000	공통
682,950,000	저소득서민	1,262,440	난지물재생센터	0,000	기공운영경비	26,250	12,573,000	차집관가 성능
150	아동복지시설 운	0	도서관 운영	77,411	2,670	가정폭력 방지 및 피해자	53,930	청담동사거리 주변외 3가
2014	서울동축제	75,885,500	FM 방송제작	25,220,000	청소년 한부모 자	878,760	빛을 유입시설 확충	8,750
567,882,980	의정활동	70,000,000	강남순환도	25,075,000	아동복지시설 생활	11,857,600	기본경비	5,100,000
2,000	경로당 운영비 등	00	한강공원 기전시설 유지	30	생활정보센터 및 지역방송실	80	유아숲체험장 조성	11,6
지방채상환(지하철)	20	잠실종합운동장 운영 및 유지	23,000,000	연매매를 통한 시	5,110	기본경비(도로사업소 6개	0	기본경비
505,000,000	아동복	63,037,700	신림 빗	10,000	기본경비	22,610,0	11,400,000	유물등록
동차 보급	000	장애인생산품 판매시설 운영	22,149,750	어린이	80,000	가로수생육환경 개선 및	10,650,000	의용소방대
10,259,000	회양기용통	56,100,000	의정활동 홍보 및	327,000	아동발달지원센터 지원	10,650,000	의용소방대	00
임당아동가족지원	52,668,800	박물관 기획전	0,000	문화재 긴급보수	20,	10,538,000	경기편한	1,569,100
54,000	아원고가차도 철거	0,685,870	시정사 및 영조물관리	20,000,000	기본경비	3,120	인력운영비	11
253,302,530	초안산 분묘군 복	49,919,570	요보호 아동 그룹	19,811,240	소방차량 유지관	1,000,000	시민 안전문화	1
850,840	수확산도시자연공원	8,540,000	공공기관 LED조명 보	19,549,600	도로정용관	604,610	강남주민지원업	4,076,360
6,936,000	서울물레길 조성	300,660	지방채상환	46,50	100,000	모바일 무료 충전	9,222,000	새로운 작
226,100,000	사회복지시설 건	44,106,130	대기 오염물질 검사	8,051,000	옥동신시가지지	1,030	구의 배수분구 하수	0,000,000



[video]

<https://vimeo.com/122192289>

single data rather than a set

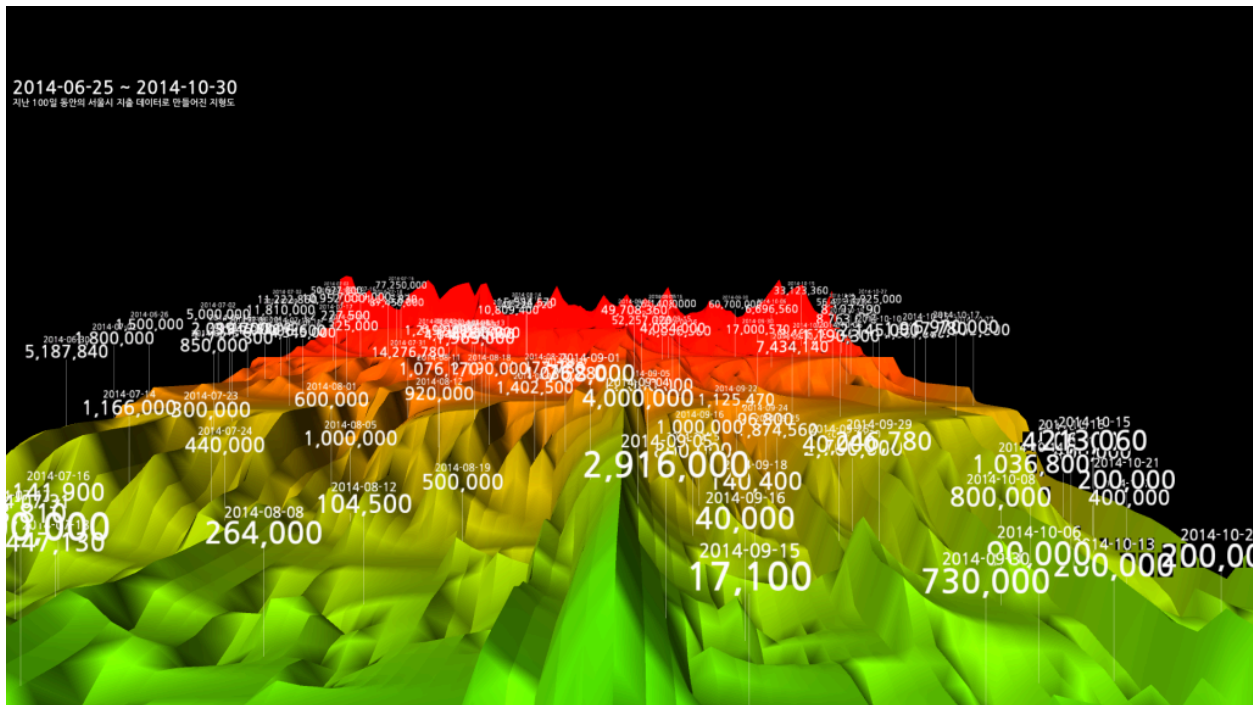
sometimes, showing single data works better than a set

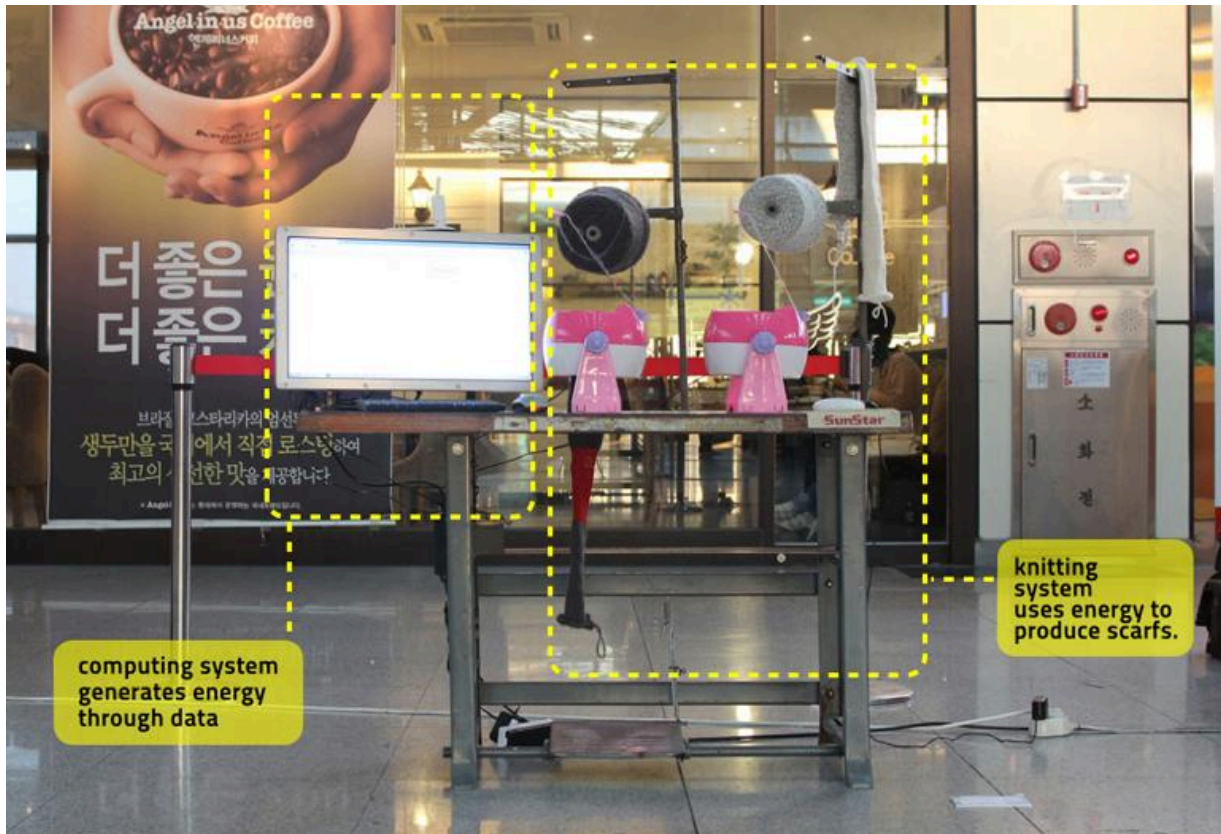
This project was a long journey. The first idea came out two years ago, right after Seoul released open API of city daily expenditure. After reviewing the feedings, we realized expenditure data was interesting as an individual form rather than a set or sorted group. Some of businesses are enough to stimulate citizen's curiosity, which might lead further civic action.



[video]

<https://vimeo.com/122192384>





[video]
<https://vimeo.com/60152860>

Selected work # 02 Mobile Traffic Data Visualization

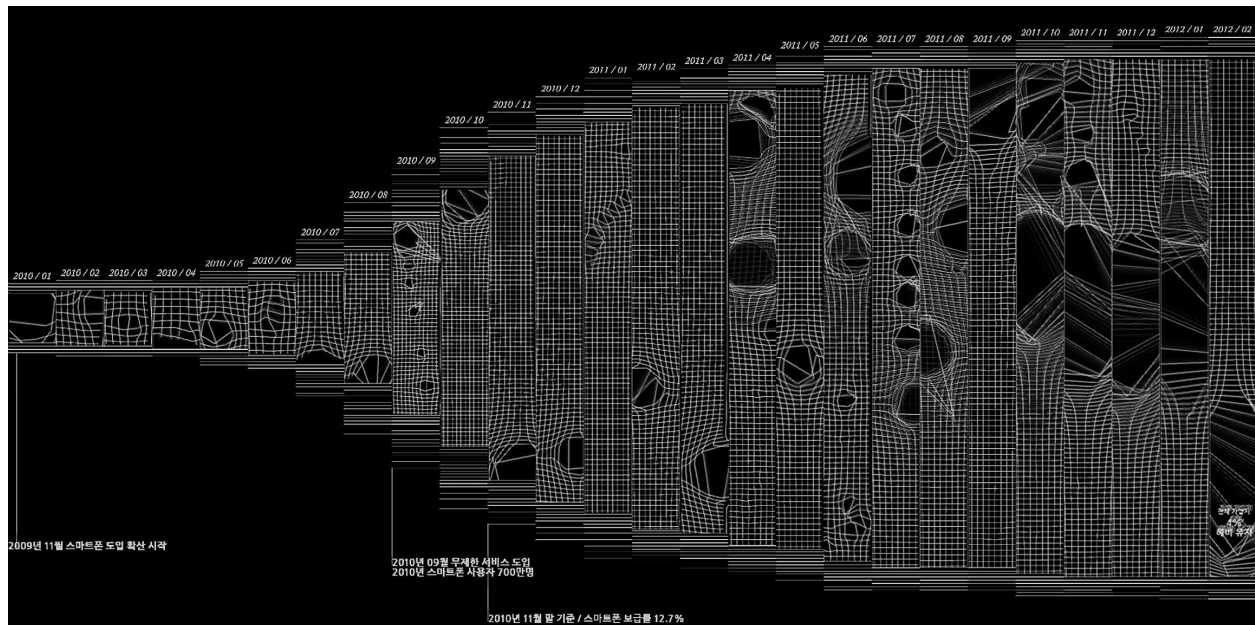
After the popularization of the smartphone, the way we consume data and produce actions have changed.

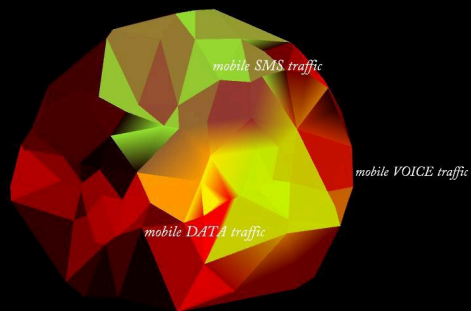
"Are we behaving properly with the new device in our hands?"

"How can we determine what constitutes proper or improper behavior?"

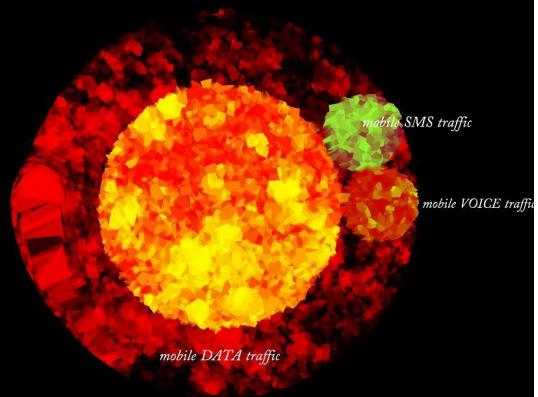
Define proper and improper behavior.

This visualization illustrates South Korean mobile traffic from 2010 to 2012. At the start of this period, Koreans adopted smartphone use quickly with data usage jumping from approximately 10% of total traffic usage, to 90% within three months. This unexpected rapid growth caused traffic delays, and the extremely heavy users (less than 10% of total users) were responsible for almost 60% of the total data traffic consumption. With the increase of data traffic came a decrease in voice and SMS traffic. Our main method of communication has shifted from "talking" to "reading and talking."

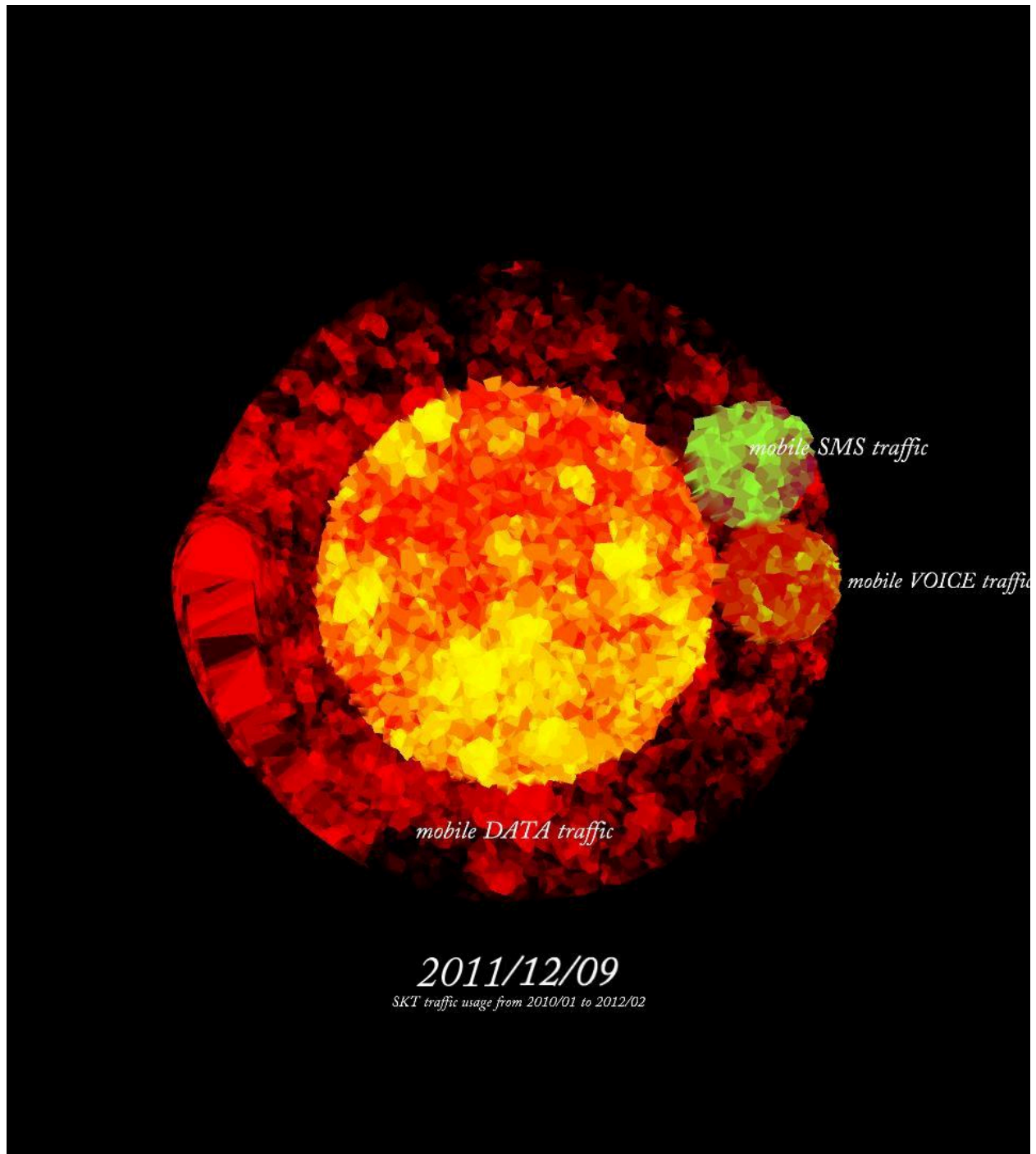




2010/02/09
SKT traffic usage from 2010/01 to 2012/02



2011/12/09
SKT traffic usage from 2010/01 to 2012/02



[video]

<https://vimeo.com/122107800>

Selected work # 01 Data formation

The use of visuals can be a very strong form of communication.

Having said that, what if we applied data to a physical space?

If data is used to determine physical space, would that be an effective way to make people more aware of their habits?

Data Formation is a high-rise residence in a future city. This uniquely designed building helps people become aware of their energy usage habits. Data Formation compares each unit's energy usage in a given month with normal usage for that unit's dimension. The amount of space available to each unit will be able to increase or decrease based on its energy use. Less energy use, more space available.

energy usage data visualizing building

data-formation

awareness leads to big changes.

Data Formation is a high-rise residence in a future city. This unique designed building helps people become aware of their energy usage habits.

Data Formation compares each unit's energy usage in a given month with normal usage for that unit's deminsion. The amount of space available to each unit will be able to increase or decrease based on its energy use.

Less energy use, more space available.



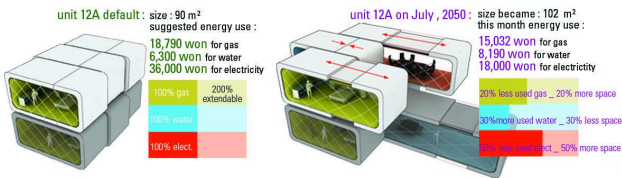
unit energy usage

standard energy use per sqm:
electricity : 400 won per sqm

water : 70 won per sqm
gas : 790 won + 200 won per sqm

* won korean currency

building energy usage

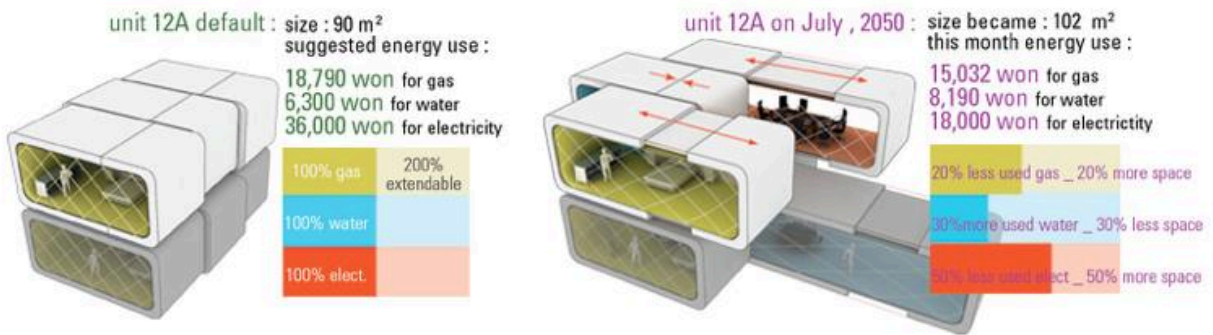


unit energy usage

standard energy use per sqr.
electricity : 400 won per sqr.

water : 70 won per sqr.
gas : 790 won + 200 won per sqr.

* won korean currency



This picture shows how each unit changes. The picture on the left shows what it would look like if no energy has been used. It is 90 square meters. After a month, if the residents use gas, water, or electricity, the size would increase to 102 square meters. This energy usage data goes directly to the place of where it was produced.

