

HUMAN ENOUGH

reconstructions of AI visions in speculative climate futures

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<https://recfro.github.io/>

Stepping through the prehistoric cave paintings of Font de Gaume, Combarelles, and others in the Dordogne, one is struck by the internal consistency of the works from site to site: the periodic fingerprints, the lions only in deepest parts of the caves, the clay red pigments of the animals, the lack of reindeers, and the lack of human forms. These signs are like the lamb and the cross in churches, but whereas we know what the cross signifies in human and religious history, we no longer think like a Cro-Magnon, and so can only marvel at the “artworks” without knowing what they mean. Churches have both meaning and content for us; cave paintings have only content. Instead of stereotyping pre-historic selves as “unintelligent,” we can only take Anthropologist Christine Desdemaine-Hugo’s posture as we traverse the sites, that their intent is “apparently spiritual in some sense knowable only to them” (Figure 1).



Figure 1: (left) Cave painting of Font de Gaume. (middle) Interior of the model of Lascaux cave. (right) Machine Learning (Stable Diffusion 1.4) interpretation of modern people observing cave paintings while cave is being flooded.

Given that languages change and become unrecognizable even in 800 years, and the symbols we use to warn or inspire lose their meaning in a millennium, the artifacts we create today are the cave paintings of the future. When our ancestors look back at our creations, they will lose the context of what they mean, but are left with the form of the “cave painting” that they can admire, or not. Our current concerns of an uncertain future, of a planet threatened by climate change and humans by their own ignorance of disease, bias, and bigotry, are comprehensible to us now, but how are these concerns being communicated to the future? What technologies do we have in our disposal to embed meaning that can go beyond words and signs, that can communicate a process that may perhaps still be recognizable by our future selves? Our legacy may no longer be single works, but of a process, an interaction with technology, an expression of angst, an intuition or an intention, serving to communicate our artifacts, our “cave paintings.”

HUMAN ENOUGH explores the process of speculative-based world construction using machine-learning generated visuals of climate futures and stories of human adaptations to these changes, which then are built into physical forms using found materials within these particular scenarios of uncertain futures (Figure 2).



Figure 2: Climate change futures and human adaptations told through text-to-image Machine Learning (Midjourney) and solutions by ChatGPT. (left) Heat and extreme temperatures; a floating city that uses underground reservoirs to reduce extreme heat. (right) Rising sea levels and storms; an aviation system that adapts to sea levels using marine transport.

The project consists of (1) a series of participatory workshops using state-of-the-art machine learning technologies used to depict climate futures and our reactions and adaptations to them, and (2) installations of constructions built from materials like recyclables and garbage found in the environment to design for these particular imaginary scenarios like extreme temperatures, rising sea-level, loss of biodiversity, long-term waste management, and public health crises.

The workshops will take place with local participants as part of community engagement with AI-based tools for art and creative applications (Figure 3). We will introduce the basic ideas of Machine Learning for art and design (see [lectures and workshops here](#)), then the publicly available online tools of ChatGPT, DALL-E2, Midjourney, and Stable Diffusion. The participants will then split into 2-3 person teams and be given a prompt for generating images using one of the text-to-image tools. The teams will be asked first to generate visions of the future in that particular scenario, for example using Stable Diffusion to depict a world with constant bouts of heat waves and fire natural disasters, while learning how to tailor the prompts to get purposeful and aesthetic results. Then the teams will ask ChatGPT the potential human solutions to these future disaster scenarios, learning to write prompts in such a way as to yield in-depth, speculative, and specific answers. Then they will take the answers provided by ChatGPT and ask text-to-image (e.g. Stable Diffusion) to again visualize the human adaptation scenarios. Finally, they are asked to adapt these visualizations into actionable designs of objects or artifacts that would illustrate this design concept in the speculative scenario given.

THREATS TO PUBLIC HEALTH

Use Dall-E2 to generate:

1. vision of the future in a world with constant danger to public health (carbon dioxide rise, acidity, pandemic).
2. what it looks like as a potential effort to overcome danger to public health (using chatGPT to come up with potential solution).



FUTURE VISION

Prompt: Photorealistic image of a city with health standards blighted by climate change, poor people particularly affected, tool of insects farmer in city, health, building, village, black market



CHATGPT SUGGESTIONS

Prompt: Give us strategies for dealing with health problems during climate change.

There are several strategies that individuals and communities can use to address health problems that may be exacerbated by climate change. Here are a few:

Stay informed: Keep up to date on the latest research and information about the health impacts of climate change in your area. This will help you understand the specific risks and challenges you may face and how to prepare for them.

Protect yourself: Take steps to protect yourself from extreme weather events, such as by having an emergency preparedness kit, staying informed about evacuation routes, and staying indoors during extreme heat or air quality alerts.

Practice good health habits: Adopting healthy behaviors, such as eating a nutritious diet, getting regular exercise, and avoiding tobacco and excessive alcohol consumption, can help you stay healthy and better able to cope with the health impacts of climate change.

Support community efforts: Join or start a community group that is working to address climate change and its impacts on health. This could include advocating for policies that reduce greenhouse gas emissions, promoting sustainable transportation options, or supporting programs that promote healthy behaviors.

Take action: Individual actions can have a big impact on climate change. Reduce your own carbon footprint by using energy-efficient appliances, reducing your consumption of meat and dairy products, and choosing low-carbon transportation options.

SOLUTIONS VISUALIZED

Prompt: image of protecting yourself from extreme weather events, having an emergency preparedness kit, staying informed about evacuation routes, and staying indoors during extreme heat.



Figure 3: Community workshop process: (upper left) Prompt querying publicly available text-to-image tools to show the public health consequences of climate change. (upper right) Example outcomes from the speculative engagement. (lower left) Asking ChatGPT for potential solutions. (lower right) Visualizing one of the suggestions made by ChatGPT.

The design solution outcomes from the workshop project will be built into installed artworks using in the second phase of the project. First, we will collect materials from a confined area where trash, recyclables, and unwanted refuse that uniquely identify the local community can be found. Then we will use [rules previously determined](#) for building design solutions in a speculative scenario to construct the speculative artifacts. For example, in accordance with the workshop, we may design a city with an underground reservoir as a solution to extreme temperatures in climate change (Figure 2). This prototype design would be sketched in idea form, and then built into an artifact like a building system or map that show both the speculative scenario idea and the solutions suggested in the workshop component. The designs are built using exchangeable found materials that demonstrate the sustainability aims of the project, converting AI-generated digital-domain ideas into actionable physical-domain constructs that reveal the human properties needed to collectively respond to climate crisis (Figure 4). The installation phase for a similar workflow has been previously exhibited internationally at [SIGGRAPH Asia as part of Art Center Nabi's Gallery](#) in Daegu Korea, at [FabCafe Kyoto](#) as part of participatory arts workshops in Japan, and at [Floating Projects in Jockey Club Creative Arts Centre](#) in Hong Kong.



Figure 4: Example constructed artifacts based on workshop participatory designs. (upper left) Exhibition at JCCAC Hong Kong. (upper right) “A New Home,” a hybrid floatable and anchorable home for uncertain sea level rises in speculative climate scenario. (middle left) Exhibition at SIGGRAPH Asia curated by Art Center Nabi. (middle right) “A New Species,” an installation of classification of natural vs. human-made artifacts in the loss-of-biodiversity speculative future scenario. (lower left) Exhibition at FabCafe Kyoto. (lower right) “Reincarnation,” work on transforming trash to renewable energy.

Technical requirements for this work includes a ~1000 lumen projector (or 30 in LCD) to show the process for the work for exhibition; materials for construction (in addition to found materials) including glue gun, tape, wires, wooden planks, drawing materials, and printed placards; an area of at least approximately 35 sq meters with pedestals and tables as required; spot lighting of warm colors (2500 K) for illuminating the created artifacts under projection environments.

HUMAN ENOUGH applies Machine Learning to imagining scenarios of climate futures, creating AI-generated design artifacts realized through found materials in sustainable practice. This process reveals to generations of the future both our own concerns for an uncertain environment and our technologies for reacting/adapting to such concerns, creating our own version of “cave paintings” that timestamp a technological moment in history.

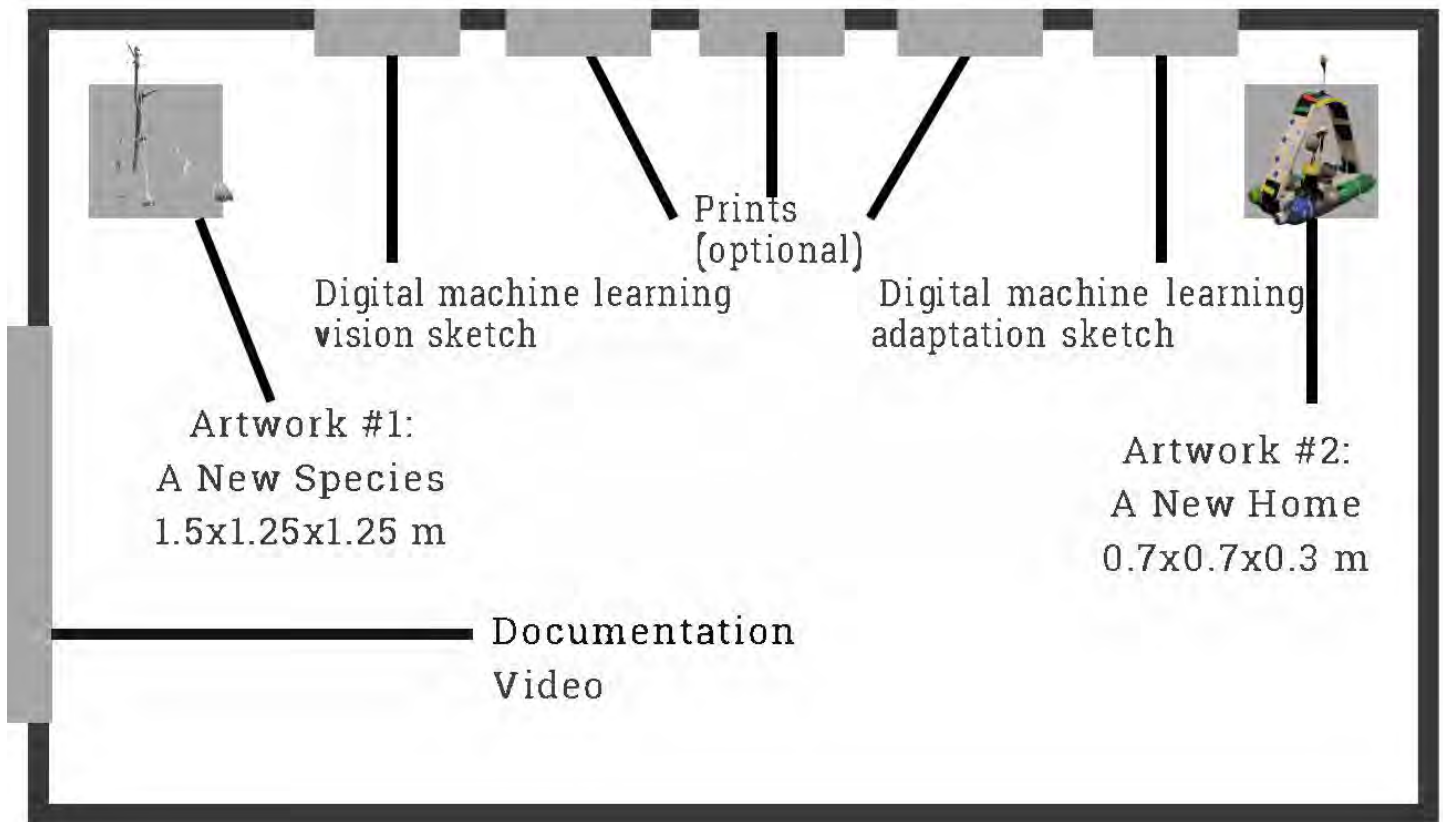


Figure 5: Preliminary installation plan for the physical exhibition. Prints are the generated images from the machine learning workshop, and can be skipped if all are put into the digital sketches. The digital sketches are the future vision prompt images from machine learning on the left, and the human adaption / solution prompt images from machine learning on the right. If space allows, additional artworks can be exhibited, but “A New Species” and “A New Home” is a minimum. The documentation video shows on a projection, so the space should be of low lighting level, with some warm lights directed at only the two physical artworks.