

Naturify 2300

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2024

Introduction

In my art practice, I explore the interplay between human desires to manipulate and anthropomorphize nature, as seen in the technological augmentation of plants and living entities. This investigation delves into how this intersection, alongside empathy towards these creations, contributes to fears of uncontrollability and the risks of addiction and excessive dependence on technology.

Bioengineering and genetic modification have cultivated unprecedented developments, allowing humans to manipulate the fundamental building blocks of life. My research speculates on this technology further, modifying the genetic code of organisms and creating bioengineered wearable entities with enhanced traits or entirely new functionalities. The primary objective of my research is to explore the ethical implications arising from the integration of technology with nature. While exploring the potential utilization of nature's healing capacity and imagining alteration of the evolution of living organisms, I investigate the consequences of continued technological progress and its effect on our connection to the natural world. The work is meant to heighten awareness about the imperative ethical considerations required when navigating the intricate interplay between artificial intelligence and bioengineering within the evolving landscape of human existence.

Nature in Jewelry

Nature, with its timeless influence on design, has always been a wellspring of beauty and proportion. Timeless symbols such as the pentagram, embody unity with Mana and Tapu among Polynesians and American Indians. Spirals, from ancient symbols to DNA structures, symbolize life's interconnectedness. From the earliest forms of communication to the sharing of body movements in dance, patterns of sharing express fundamental unity. Writing, evolving from

geometric symbols, reflects shared human experiences. Nature's harmonious proportions, as explored in *The Power of Limits* by György Dóczy, are evident in shells, fish anatomy, and the human body, where each vertebra and bone adheres to these shared limits. Unity within diversity is seen in snowflakes, shells, and species development, reflecting the wisdom of nature that guides harmonious living and design, as seen in both ancient teachings and modern technology.¹

The prehistoric origins of jewelry are deeply rooted in materials sourced from the natural world. Since pre-civilization, a hundred thousand years ago, people adorned themselves with jewelry made from locally available materials, each piece rich with symbolic and cultural significance. Shells, easily found along coastlines and riverbanks, were among the earliest materials used, forming beads and pendants dating back to the Paleolithic era. Similarly, bones were fashioned into ornaments, often carrying spiritual or ritualistic meanings. As time progressed, the use of stones and minerals became widespread, with semi-precious stones like turquoise, lapis lazuli, and jade prized for their vibrant colors and mystical properties, meticulously shaped into intricate designs reflecting reverence for nature and celestial phenomena. This deep connection to nature's elegance influenced prehistoric artisans to emulate the graceful forms and patterns found in the natural world, from the curves of shells to the symmetry of feathers, creating pieces that served as not just adornments but embodiments of spiritual connection and reverence for the earth's bounties. This tradition of honoring nature's beauty and balance continues in contemporary jewelry design, blending the timeless legacy of ancient adornment with modern sensibilities and technologies.

¹ Dóczy, György (1981). *The power of limits: proportional harmonies in nature, art, and architecture*. [New York]: distributed in the U.S. by Random House.

Throughout history, from ancient civilizations such as Egypt, Greece, and Rome to the Renaissance and Victorian eras, jewelry has featured intricate flora and fauna motifs, symbolizing a profound connection to the natural world and conveying sentiments of love, fertility, and protection. The 19th century witnessed a surge in nature-inspired designs, with motifs like butterflies and snakes representing eternal love. In the 20th century, the Art Nouveau movement embraced organic forms, drawing inspiration from nature's asymmetry and flowing lines. Today, contemporary jewelry designers continue this tradition, incorporating organic elements, sustainable materials, and biomimicry, demonstrating an enduring fascination with the timeless beauty and symbolism of nature. For example, Korean jewelry artist Seulgi Kwon's work is inspired by the beginning of life in the natural world. She uses thin silicone to capture the life stages of microscopic organisms and transform the movement of cells and growth division into jewelry that honors nature's order and harmony.²

The birth of life starts from cells transforming in a beautiful visual process and continues through death. Nature often presents decay with a touch of beauty, as vibrant colors emerge while microbes diligently carry out their work of decomposition. Sculptor Kathleen Ryan uses semi-precious gemstones to portray mold colonies on her fruit sculptures. These pieces, in contrast to the commonly disdainful view of the decay, death, and spoilage of everyday fruits, ingeniously employ precious and delicate gemstones to eternalize the diversity of mold growth on the fruit's surface. With a sly sense of humor, the gemstones create a robust armor for new life and embody the cyclical relationship between life and decay.³ In designing

²“Mobilia Gallery.” Seulgi Kwon, www.mobilia-gallery.com/artists/seulgi-kwon/. Accessed 14 Jan. 2024.

³“Kathleen Ryan Biography, Artworks & Exhibitions.” Ocula the Best in Contemporary Art Icon., ocula.com/artists/kathleen-ryan/. Accessed 14 Jan. 2024.

speculative bioengineered living devices, I consider the cycle of birth, growth, and decay to nurture empathy and signify the inevitability of change.

Bridging Nature and Technology

Technology has brought about substantial physical changes in our lives, by reducing manual labor, facilitating transportation, and improving our living conditions. However, this wave of progress also bears substantial responsibility for environmental challenges like urban expansion that contribute to ecological degradation. Alongside the influence on our physical world, technology has had a profound effect on our psychological world. Modern society is facing overstimulation introduced through constant exposure to new information and content in our daily lives through computers, TVs, phones, fast flashing images, and light stimuli.⁴ With constant stimulation, the human body desires quick dopamine. A study led by Manon Dubol et al, using multimodal brain imaging, reveals that dopamine production influences the reward system. Engaging with digital content heightens the anticipation of receiving a reward, such as likes, comments, or social validation, triggering the release of dopamine in our brains and shaping our behaviors towards continued use. Constant exposure to information increases dopamine expectations, potentially leading to overstimulation, anxiety, and depressive moods.⁵,

Humankind is at a pivotal point where it's not only possible but crucial for humanity, nature, and technology to coexist harmoniously. Currently, technology plays a crucial role in restoring the natural world. Neptune Memorial Reef in Miami, Florida, the largest man-made reef, reveals the fascinating coexistence of natural life and artificial constructions. As reported by

⁴ Robinson, G, The threat of comprehensive overstimulation in modern societies. Ethics and Information Technology, (Iowa: State University 2016)

⁵ Dubol Manon, et al. Dopamine Transporter and Reward Anticipation in a Dimensional Perspective: A Multimodal Brain Imaging Study. Neuropsychopharmacology. (PMCID: PMC580978) 03/2018

the Department of Environmental Resource Management, the restoration of the reef has succeeded in reviving the local ecosystem and attracting more coral and marine life.⁶

Technology assists with the regeneration of nature and inspires and informs technological advancements that support human well-being. Nature has been scientifically proven to enhance mental health and overall well-being. A study done by Mathew P. White et al. has proven that simply immersing oneself in a natural environment can reduce stress, improve immune system function, elevate mood, and enhance cognitive functioning. According to a study of 100 people in Helsinki, Finland, a short break in a virtual forest environment brought about a significant improvement in vitality, mood, and perceived restoration outcomes such as relaxation and calmness, increased attention, a clear mind, and clear thinking.

Growing up in the city, amidst concrete residences and towering structures that block access to nature, I feared losing touch with the natural world as a source of mental solace. The fear intensified by urban expansion and technological progress and became a catalyst for transformative action. I believe jewelry provides a direct medium for people to connect with nature through technology and my project *Awaken* illustrates this belief by merging augmented reality with physical jewelry. I created a ring with an embedded pattern that, when scanned by artificial reality software and viewed on a screen, a virtual plant grows from the ring, enabling the wearer to interact with a virtual world through a physical ring. Our physical senses play an influential role in shaping our perception of the world. Rings attach to our fingers, offering both tactile feedback and control over virtual elements due to the fingers' dexterity and sensitivity.

⁶ Neptune Memorial Reef: About the Reef (<https://nmreef.com/about/>)

This design not only facilitates a novel connection with nature but also promotes mental well-being, technological innovation, and artistic expression.

Bioengineering and Artificial Nature

We have the means to harness technology and design in harmony with nature. Designers and scientists draw inspiration from the natural world to develop technology through biomimicry where nature serves as a model for developing technologies that address intricate human problems.⁷ Andreas Mershin at the MIT Media Lab is developing a project that investigates a mechanical smelling device inspired by the extraordinary olfactory abilities of dogs. Dogs have the remarkable skill of detecting chemical changes emitted from human skin, making them quick to alert us to any bodily changes. At the Media Lab, innovative programming and advanced machinery are being employed to develop a technology aimed at replicating the sense of smell for medical diagnostic purposes. As we look ahead, our innovations will continue to draw from the rich tapestry of nature, paving the way for technologies that are not only advanced but also deeply interconnected with our natural world.

Envisioning a future where technology nurtures a symbiotic bond between humans and nature, I developed the speculative design project *Arora*, a conceptual wearable lifesaving necklace inspired by my research on sea slugs, leveraging principles of biomimicry. Surprised by the purposeful features of sea slugs, particularly their use of color for defense, I designed a device using color signals on the body to indicate danger, with colors changing based on the wearer's health and pulsing in rhythm with their heartbeat. Incorporating various technologies to

⁷ Emily Kennedy, Daphne Fechey-Lippens, Bor-Kai Hsiung, Peter H. Niewiarowski, Matthew Kolodziej; Biomimicry: A Path to Sustainable Innovation. *Design Issues* 2015; 31 (3): 66–73.
doi: https://doi.org/10.1162/DESI_a_00339

detect the wearer's health, the device offers vibration and sound alerts while using colors as a visible warning to those nearby, enhancing situational awareness during emergencies.

Advancements in technology, specifically in the fields of bioengineering and tissue engineering, are poised to revolutionize various industries. The convergence of material and biotechnology necessitates the intersection of scientific inquiry, artistic expression, and design thinking to generate collaborative knowledge, ultimately shaping the course of evolution. At present, we utilize 3D printing methods to incorporate natural substances, and this technology is steadily maturing while undergoing experimental advancements. The Silklab at Tufts University focuses on the application of silkworm cocoons, where scientists use lab equipment to break down and rebuild cocoons to enhance their inherent properties of strength, flexibility, and biocompatibility, and later apply this material to create medical implants using 3D printing technology. This has enabled the creation of dissolvable implants, medicine, and more.⁸

I am intrigued and inspired by the technological advancements that work with natural organisms to find solutions to cure diseases and injuries and to further enhance our lives. *Neo Fruits* is a speculative technological design project by Industrial Designer Meydan Levy that explores a scenario where humans will create food artificially due to overpopulation. This project involves the design and 4D printing of artificial fruits, presenting a nutritious and vitamin-rich alternative to conventional fruits. The integration of industrial processes and enhanced scalability has led to shifts in the structure of our food through advanced food processing techniques, deviating from its original form.⁹

⁸ Silklab, Technology from the Planet (<https://silklab.engineering.tufts.edu/>)

⁹ "Project Neo Fruits." Portpoliome, meydanish.wixsite.com/portpoliome/project. Accessed 14 Jan. 2024.

The ability to artificially edit and control nature inspired me to imagine the next step of genetic engineering. The power of imagination grants us the possibility to push the boundaries of what we think is possible to help us anticipate and prepare for challenges ahead, and further inspire real-world innovations. Under the inspiration of genetic engineering, I aim to create a series of speculative designs that challenge us to consider the ethical, social, and scientific implications of our choices, playing an important role in the ongoing global conversation about the intersection of technology, humanity, and the natural world. Questioning the morality behind artificial interference with living entities invites us to consider the ethical implications of these actions. Many plants in our daily lives have been genetically edited, including soybeans, wheat, corn, tomatoes, and bananas, among many examples. I envision a world where genes are mostly edited, and where natural ingredients no longer need to be processed. What kind of jewelry will people wear when we develop sustainable and environmentally responsible cities? Could jewelry be a medium to repair the relationship between humans and nature? With advanced genetic modification technology, I foresee the ability to program plants, transforming them into biotechnologies beneficial to the body. Through computer-aided design (CAD), I design and program nature in virtual spaces, amplifying the therapeutic potential of natural elements. Utilizing 3D printing, I bring these designs into the physical world, providing the public with a tangible preview of the potential interactions with nature in the future.

Aromas of Time: The Future of Memory Preservation is a fictional bioengineered toolkit I designed, that includes a necklace, a wearable nose sensor, and a storage bank. The sense of smell is a chemical stimulation through long-distance perception, which is more sensitive than hearing and seeing to help the body learn and process external information. Receiving a smell stimulates the hippocampus, the part of the brain that is responsible for regulating memory and

emotions. Our sense of self, decision-making, and mental health are heavily reliant on memories. I envision in the far future, the ability to record smells through technology for memory documentation will hold immense promise for applications in the medical field, particularly in triggering memories as a psychological treatment for conditions such as Alzheimer's and amnesia. The *Memory Necklace* embodies this concept as a deeply personal experience, recording the user's olfactory encounters. It functions through the utilization of body temperature and oxygen to sustain its activity and facilitate the growth of living cells into sensors. These sensors store the smell, which evolves based on the user's environment. Upon harvesting the sensor, it ceases to receive new scent signals, locking in the captured aroma. The *Memory Reader* complements the necklace, featuring synthetic sensors that detect and analyze airborne compounds, translating them into electrical signals for the brain to interpret, thereby evolving a sense of smell. The *Memory Bank* is integral to the system, ensuring the sensors remain breathable. Due to the airflow and reading processes, scent particles may diminish over time, necessitating care approximately once a month or after each reading. Leveraging body temperature, the Memory Bank aids in reproducing the stored scent compounds, ensuring the preservation of precious memories that we cherish and wish not to forget over time.

The series *Botanical Bliss: Jewelry that Nourishes Mind and Body* has a similar principle. I use plant-based capsules, dry herbs, bullet packaging, sterling silver, and steel pins in both *Remedy Oasis (Brooch)* and *Zen Ammunition (Ring)*. Crafted from dried herbs like those used in Chinese medicine, these pills harness the innate regenerative power of nature to promote meditation, mental and physical healing, and the reduction of psychological stress. Each herb, with its distinct effects ranging from sleep induction to mental invigoration, contributes to this holistic experience. Unlike traditional medical capsules, these pills require no processed

medicinal powders, thanks to advanced bio-engineering technology that directly manipulates the cellular structure of flowers, imbuing the herbs with their full medical functionality. In an era favoring organic foods, these consumables of the future may retain a natural appearance while harboring intricately programmed genetic interiors. Designed to evoke a profound sense of calm, these ingestible herbal wonders draw inspiration from traditional Chinese medicine's belief in the soothing properties of rose tea, which is said to regulate blood, ease emotional turmoil, and alleviate liver and stomach discomfort.

In a highly technology-driven future, I imagine genetically modified living jewelry serves as an intimate medium for humans to connect with nature and as an advancement to heal the mind and body with programmed nature. Crafted from bioengineered materials and incorporating the regenerative power of nature, these jewelry pieces offer a holistic approach to well-being. Whether through the Memory Necklace, which captures and evokes cherished scents for therapeutic memory recall, or the herbal pills imbued with the medicinal essence of carefully selected herbs, these creations bridge the gap between technology and nature. As we move towards a future where the boundaries between the artificial and the natural blur, these innovative designs offer a glimpse into a world where our relationship with nature is not just preserved, but enhanced, fostering harmony and healing for generations to come.

Speculative Symbiosis and Artificial Intelligence

In the speculative world I have built, and developed, we are transported to the urban high-tech future of the year 2300. Here, a biotech corporation named Naturify stands at the forefront of bioengineering advancements. This future is characterized by the emergence of genetically engineered living jewelry, which serves as an intimate medium for humans to connect with nature. Naturify has harnessed the power of genetic modification to program plants,

creating plant companions that allow humans to immerse themselves in artificial natural forms. This immersion provides sensory experiences and a form of natural therapy, healing our minds and bodies with programmed nature. The profound synergy between humans and technology is underscored by these bioengineering advancements, reflecting a world where organic life and technological innovation merge.

Imagined realities explore our fears, desires, and our response to the unknown. It helps us understand what it means to be human in a rapidly changing world. Our fears surrounding artificial intelligence (AI) are further amplified when viewed through the lens of science fiction, which often portrays AI as either a dystopian force or a potential existential threat to humanity. Science fiction has long served as a mirror, reflecting our societal anxieties and speculating on the consequences of unbridled technological advancement. The narratives of sentient robots, rogue AI systems, and the erosion of human autonomy have contributed to a collective apprehension about the uncontrolled proliferation of AI technology. Additionally, the rapid and widespread development of accessible AI applications in the real world intensifies these concerns. AI has become increasingly integrated into our daily lives, and from autonomous vehicles to virtual personal assistants, the potential for misuse and unintended consequences has become more palpable. These elements converge to create a complex landscape where the promises and perils of AI technology coexist, demanding our vigilant consideration and ethical guidance as we navigate this uncharted territory. ChatGPT, for instance, represents the culmination of advances in natural language processing, capable of generating human-like text

and engaging in meaningful conversations. Simultaneously, there are increasing concerns about the potential misuse of AI in spreading misinformation and deepening social divides.¹⁰

Detroit Become Human, published in 2018, is a video game based in 2038, where artificial intelligence and robotic technology have evolved.¹¹ The plot follows three android protagonists—Connor, Markus, and Kara—each with individual storylines and perspectives. The game reflects on topics paralleling real-world issues like civil rights, race, and gender equality by exploring the treatment of androids as sentient beings. Players create a personal emotional bond with the characters by shaping their personalities and their roles in the game's interconnected plots, impacting the struggle for equality within the game's world. The game's interactive storytelling navigates real-world moral dilemmas, prompting players to ponder the evolving definition of "alive" in artificial intelligence. These AI creations, imbued with human-like understanding and relatability, raise questions about the rights and responsibilities we should assign them, blurring the lines between machine and humanity. As players engage with characters exhibiting personalities and vulnerabilities akin to humans, the game sparks conversations about the moral dimensions of our technological creations and the ethical responsibilities they entail. Does our behavior change once we think they are “alive”? Through fiction, we often see a reflection of reality and the projection of potential consequences as warnings to the audience. This is particularly evident with advancements in robotics, artificial intelligence, and neural science. While not explicitly stated, these narratives serve as cautionary tales, offering insights into possible outcomes before they materialize in the real world.

¹⁰ ChatGPT, GPT-4, OpenAI, 30 Jun. 2023, chat.openai.com/chat.

¹¹ Video Game: *Detroit Become Human*, (Detroit Michigan 2018.)

At the *NOX exhibition* in Berlin, Germany, Lawrence Lex presents a speculative work exploring the integration of AI into urban life. The immersive cinematic experience unfolds across three floors, telling the story of a depressed AI car named Enigma-76. Visitors, acting as sponsors of the NOX corporation, wear headphones with location trackers that play narrative monologues as they explore the space. Through a mix of locative sound, computer-animated video, installations, and game design, Lawrence creates a film noir atmosphere, illuminating Enigma-76's journey of self-discovery during therapy with the AI bot Guanyin. Enigma-76's quest for identity leads it to envision a horse, a symbol of ancestral connection before the era of cars, breaking free from its programmed constraints to embrace temporary freedom before undergoing a reset at NOX for repair. This poignant narrative evokes deep empathy, highlighting themes of agency, ethics, consciousness, and empathy in the intricate relationship between humans and the machines they create within highly controlled automation systems. The exhibition prompts reflection on the dynamic interplay of artificial intelligence, nature, and humanity, while also raising concerns about the potential consequences of granting autonomous decision-making power to these technologies.¹²

“Look Closely at the present you are constructing, it should look like the future you are dreaming”- Alice Walker. In the times to come, we can expect a blending of boundaries between humans and AI, as well as the digital and physical realms. This transformation will be propelled by advancing technology, making it increasingly challenging to distinguish between human and AI interactions, and causing the digital and physical worlds to merge into a seamless experience. Will nature evolve along with our development in urban cities and become technology itself with

¹²Nox Exhibition Guide. Light Art Space gGmbH | NOX Exhibition Guide. (n.d.). <https://www.las-art.foundation/explore/nox-exhibition-guide>

the help of artificial intelligence? How do creations that combine technology with plants challenge and examine our capacity for empathy and emotional engagement toward nonhumans?

Project Florence developed by Microsoft Research in Redmond, WA, explores a fascinating way for humans to communicate with plants. A team of six researchers, including Helene Steiner, Asta Roseway, Paul Johns, Sidhant Gupta, Jonathan Lester, and Chris Meek, collaborates on this initiative, which aims to create new dialogues with the natural world. The process involves typing messages on a Microsoft Surface tablet connected to the plant ecosystem. These messages are sent to a cloud service hosted in Azure, where Natural Language Processing analyzes sentiment and sentence structure. The resulting stimuli, such as colored light, are translated into signals that the plant can understand and respond to based on its ability to react to different light frequencies. Florence, equipped with various sensors monitoring environmental conditions, then generates conversational responses driven by linguistic input and sensor readings. The technology opens possibilities for agricultural applications, environmental monitoring, and urban gardening, envisioning a future where humans actively engage and collaborate with the plant kingdom in sustainable and natural ways. It is the present, and we are already living in the future. Here is my favorite conversation Florence had with the engineer:

Human: How old are you?

Florence: Hey, look, I am growing... pin a rose on your nose.

Human: Goodbye

Florence: Don't love you anymore... cares melt when you kneel in the garden.¹³

Based on my research and my interest in having an intimate relationship with nature in

¹³ Shin, N. (2023, June 27). Project Florence finds a way to communicate with plants. COOL HUNTING®. <https://coolhunting.com/tech/project-florence-microsoft-research-talking-to-plants-communication/>

the human body in the future, I created the speculative design project *MoodCrafters: Biotech Pet Companions for Inner Balance* as the first product of Naturify. It is a series of nine pieces I made using 3D-printed resin, paint, fiber, and biomaterials such as gelatin and eggshells. In this series, I explore prosthetic and medical applications inspired by both barnacles and diabetes pads.

Barnacles have a parasitic relationship with their host, much like our relationship with technology. Bioengineering allows humans to artificially modify nature and incorporate technology to alter living entities. Through tissue- & genetic engineering nature could become the technology we are meant to use. Each MoodCrafter has a body structure that consists of a skeleton grown from calcium in the laboratory, offering a protective framework that grows in tandem with the flesh. The flesh, genetically modified using various plant varieties, is designed to root onto the human body through a body enhancement procedure, forming a seamless integration between the device and its wearer. MoodCrafters are living emotional support companions that bond with the owner to detect any changes in the body. The device produces electrical signals to increase mood, elevate well-being, and restore mental health, and are gene-defined to have different functions that meet the user's needs. The presentation of this series mimics a pet store, where each MoodCrafter has its information tag that has brand, name, life span, benefits, and personality. For example, *Galaxilith* is bred from TerraLife with a 2-year life span, it helps the wearer calm anxiety, reduce restlessness, and induce a sense of inner peace. *Galaxilith* Requires regular gentle watering and exposure to soft music for relaxation.

Addiction, Reliance, Control, Uncontrolled

In this speculative tech company Naturify's system, I developed more products to further enhance the user's interactive experience. In the series *Resonance of Nature*, I embodied the speculative concept of artificially programmed nature that as alive, interactive objects. Exploring

forms and sensations such as smell, touch, and hearing, I use plants like sweet orange, lavender, and eucalyptus, commonly processed as essential oils, alongside shapes inspired by natural plants and animals, to create interactive objects for mental healing rituals aimed at relaxation.

BioAdornments is a necklace that features growing elements such as moss and ferns that actively purify the air through photosynthesis, providing constant and clean oxygen to the wearer. *Echo* is a hand-held device that utilizes genes from trumpet flowers and seashells. It captures ambient sounds in the environment through the half-hollowed structures, offering a calming and relaxing effect when grasping. *Fragrance Painter* transforms the act of applying perfume into an interactive experience. It utilizes genetically edited species that look like flower stamens as fibers of a brush to paint floral scents onto the skin. *Breath*, an enhanced lavender device worn on the nose, not only purifies the air but also provides a calming fragrance to soothe the mood. *Rhythm* is an organic ear device that alters the frequency of lavender into soft sounds, creating a sensory experience that fosters relaxation. Finally, *Aroma*, a hand-held device, cultivates genetically edited plants like sweet orange, lavender, and eucalyptus, emitting a therapeutic mixture of scents upon touch.

Together, this series of works redefine the relationship between humanity, technology, and nature, showcasing a future where wearable nature-infused tech enhances well-being and sensory experiences. To illustrate the speculative context of the series, I created a short film utilizing AI. I trained AI by inputting prompts such as functions and images of related plants as well as the texts relating to the specific mood and feeling I wanted to achieve, generating the images, voices, sounds, and movements of this film. Display and set design play important roles in evoking audience involvement in my speculative future. I want to achieve an immersive experience and environment to welcome everyone to participate in this shared future.

To what extent does the function of science fiction and imagination impact the present? Speculative design isn't a definitive solution, but rather an exploration that provokes essential questions, raising possibilities within the public consciousness. Creating speculative innovations reflects my approach to embracing the swift pace of technological advancement, embracing fear, and a deeper understanding of technology's potential and limitations. I hope to instill a profound sense of respect and admiration for nature, all while acknowledging the pivotal role of technology in shaping our lives.

In today's society, humans must keep pace with the rapid evolution of technology, and I believe nature does as well. In the far future urban environments will most likely be dominated by artificial creations and a lack of nature. To ensure a harmonious future coexistence with the natural world, individuals must foster a stronger connection with nature. This connection will enable us to comprehend the vast potential inherent in the natural world, harness its capabilities, and evolve them into wearable technology that benefits the human body on a daily basis. By doing so, we can establish a society where advanced technology and the natural world coexist.

Confronting the challenges of rapid technological development requires us to consider human emotional understanding alongside ethical discipline in future inventions. As we form bonds with these creations, making ethical decisions becomes increasingly complex, particularly as attachment and empathy grow. Ensuring their proper use becomes crucial to avoid irreversible consequences stemming from addiction and excessive dependence on these innovations.

From my own experience living in Shanghai, which continues to be affected by overpopulation and internationalization in trade and technology, I imagine a future where a significant portion of the world's population will inhabit high-tech urban areas, allowing wild nature outside of the cities to rejuvenate without human intervention. Humans establish "nature

libraries" to store plant and seed samples, preserving their genetics into coded data on a global network for accessibility, study, and storage. The amassed plant data serves as a foundation for creating unique species with specialized functions and forms, seamlessly integrating knowledge across various organisms. By sharing data, a bioprinting studio anywhere can replicate different technologies based on biotech recipes created by scientists, transforming plants into technology that heals and benefits humanity and improves the quality of their lives. They could be a solution and assistant if used in the right way, but they could also have the potential to evolve into a problem that requires, again, another future invention. While exploring these narratives can shed light on potential risks, the ultimate solution may address the underlying issue of overreliance on technology. Finding a balance between understanding the potential consequences and actively working towards responsible usage is crucial. Based on the world background above, Naturify's products are based on the following foundational parameters:

1. Target a social issue related to the human body that occurs after overusing technology.
2. Research and find a plant that cures or is related to the symptom.
3. Design the artificial nature based on plant study and design the device to locate it on the body based on the symptom.
4. Consider the side effects of overusing this technology.

According to these parameters, I developed four different wearable biodevices that address one problem caused by using technology such as depression, appearance anxiety, obesity, and communication. Informed by the conceptual motivations of the work, I use a technology driven working method that engages the digital realm through CAD design, 3D

printing, 3D scans, electroforming, and silicon casting to create an artificially programmed speculative nature system.

Depression Relief, a device crafted with genes from cognitive-enhancing plants like lion's mane mushroom and ginkgo biloba, combats the impact of technology addiction on cognitive function. Placed near the brain's hippocampus above both ears, this device offers a day of temporary happiness in exchange for feeding it negative thoughts and memories. The more profound the wearer's depression, the more energy the device draws. Caution is advised: prolonged reliance may lead to an identity crisis and emotional detachment due to severe memory loss and cognitive disorders. *Depression Relief* presents an innovative solution to modern mental health dilemmas, but its benefits must be weighed with mindfulness and awareness of potential risks.

Mask Up, an anti-aging mask addresses the anxiety surrounding beauty standards and aging. Crafted with genes from papaya and green tea, this innovative mask aims to dissolve aged skin cells for a rejuvenated appearance. Excessive use may result in the skin becoming more vulnerable and thinner, leading to an identity transformation as the mask embeds itself deeper, potentially replacing the wearer's original features. *Mask Up* presents a novel approach to skincare, but careful consideration of its effects is advised to balance its benefits with potential changes to one's appearance and identity.

Body Patch is a revolutionary solution aimed at addressing obesity and controlling appetite, born out of concerns about the societal impact of technology addiction, which has been linked to increased sedentary behavior and overeating. Crafted with elements from green tea and plant fibers, this patch absorbs excess fat and curbs appetite when worn on the waist. Prolonged use can result in anorexia, malnutrition, and even the reverse effect, as the patch roots itself

deeper into the body, potentially causing an overgrown appearance. *Body Patch* provides a forward-thinking approach to weight management, yet users must carefully consider its usage to balance its benefits with potential risks to their health and appearance.

Neural Walkie, an innovation in human communication, offers an upgrade in a world dominated by technology-driven interactions. *Neural Walkie*, inspired by the communication methods of interactive plants such as *Mimosa pudica* and Venus flytrap, allows individuals to connect and communicate through plants, drawing on the concept of plant signaling and communication. Worn on the ear and activated with a gentle touch, this device transfers human thoughts into plant signals for instant communication with other users, transcending language barriers and revolutionizing interpersonal connections. Prolonged use can result in a loss of interest in verbal communication, with individuals gradually forgetting languages and potentially causing a breakdown in human connections. *Neural Walkie* presents an exciting advancement in communication technology, yet users should be mindful of maintaining a balance to preserve the richness of human interaction and language.

NeuroX is the next generation of *Neural Walkie*, and it is the latest technology from Naturify. These living receivers absorb and translate human thoughts into plant signals to facilitate immediate communication with other users without the need for verbal or written expression. It removes language barriers and assists hard-of-hearing individuals. This aims to mirror online human communication with technology in real life, including interactions with AI and robots. All these technologies require personal data or information input to personalize and better assist the wearer. The plant device, alive in nature, establishes a symbiotic relationship with the human host. The longer the wearer transmits thoughts, the better the plant understands, creating a personalized style of communication based on the user's preferences and personality.

Over-reliance on instant communication might lead to social isolation, altering the nature of human interactions. It could change communication patterns entirely and potentially cause the loss of languages and cultures. To illustrate the consequences of overuse, I directed a story around an uncontrolled *NeuroX* as the main plot of my series of works, highlighting ethical concerns stemming from the intimate relationship between humans and artificial nature. *NeuroX*'s ability to absorb extensive information about the wearer's thoughts raises privacy issues, while the development of a plant's personality could result in uncontrolled behavior, causing emotional distress. This scenario raises ethical considerations regarding the use of technology on living entities, emphasizing the human empathy and emotional connections formed as the plant becomes a companion to the human body, creating an intimate bond. The device absorbed an abundance of information from its owner, leading to the development of a distinct mind and personality separate from the owner. At a certain point, the user began to hear conflicting thoughts that did not originate from themselves but from the plant. This caused the device to question its own identity, transmitting emotions and signals such as crying and depressive information to the owner, and causing anxiety. Fearing the negative effects, the wearer decided to discard the device, resulting in a loss of language ability and the solitude of losing a companion. This unusual case led to the device's return to the laboratory for further investigation.

Reflecting on this complex relationship between humans and bio-technological devices, it becomes crucial to consider the potential consequences of over-reliance. Exploring how this impacts interpersonal connections, communication dynamics, and the risk of distancing among individuals becomes imperative. Furthermore, addressing concerns about the potential loss of language diversity and cultural nuances due to widespread adoption becomes essential in

navigating broader societal implications. Ultimately, delving into the ethical considerations surrounding the use of technology on living entities prompts us to question the consequences of personalized communication and the responsibilities we bear in shaping the symbiotic relationship between humans and artificial nature.

The display and the introduction of an AI video in the exhibition contextualizes the work and transports the audience into a speculative future, circa 2300. This multi-sensory setting of Naturify is crafted through a carefully designed installation that merges the aesthetics of a futuristic corporation, and a laboratory. The corporate setting is utilized to showcase wearable biotech devices as futuristic artifacts, reflecting the rapid progression of technology and its integration into daily life. Interactive elements borrowed from hospital and laboratory environments invite the audience to engage directly with the creation process. This interactivity underlines the experimental and hands-on nature of the designs, fostering a deeper connection and understanding of the work. The AI video serves to enhance this immersive experience, guiding viewers as they navigate the intersection of advanced biotechnology and the envisioned societal structures in the 2300s. Together, the display and AI introduction video establish not just an exhibit but a comprehensive portal that challenges perceptions and encourages contemplation of the future interplay between humanity, technology, and nature.

Meticulously nurtured seeds, genetically edited in laboratories, anchor the product development process and illustrate the evolving landscape of cultivation. Each seed is assigned a unique number and formula marked on its base, residing within individual globe-shaped incubators. BioFloraX-2025 represents an advanced genetic code designed for a bioengineered plant that would grow into a wearable device with a specific function. The formula is a blend of

nucleotide bases and coefficients that contribute to the plant's unique characteristics and performance:

BioFloraX-2025:

$$GC = [ATCG] \times (EC + 3.5) / (HM - 1.8) * (2.4 ^ MP)$$

- GC: Genetic Code Sequence
- ATCG: Nucleotide bases (Adenine, Thymine, Cytosine, Guanine)
- EC: Environmental Coefficiency (reflects adaptability to various conditions)
- HM: Nutrient Homogeneity Factor (ensures balanced nutrient absorption)
- MP: Metabolic Prowess Index (determines the plant's metabolic efficiency)

*Explanation: The combination of Adenine (A), Thymine (T), Cytosine (C), and Guanine (G) forms the core nucleotide sequence, defining the plant's DNA. Environmental Coefficiency (EC) introduces adaptability, allowing the plant to thrive in diverse environmental conditions. A higher EC value signifies enhanced adaptability. The Nutrient Homogeneity Factor (HM) ensures balanced nutrient absorption, promoting optimal growth and development. The Metabolic Prowess Index (MP) quantifies the plant's metabolic efficiency, influencing its energy utilization and overall health.

Each seed's physical body is meticulously crafted through advanced 3D printing technology. Drawing parallels with contemporary medical advancements, 3D printing serves not only as a method for creating transplant organs but also as a method by which artificial processes give rise to new life forms. In this envisioned future, advanced bioengineering techniques allow for the artificial editing and mass production of plants designed as tools and devices for human use. The incubators, inspired by eggs, symbolize the inception of life, serving as protective

shelters for the seeds. Repetition and units establish a cohesive base that reveals the origin of the plants, grown from lab-generated data formulas, prompting contemplation on the ethical implications of blurring the lines between the artificial and the natural. The design of these incubators is crafted to evoke an emotional connection that fosters empathy towards living entities affected by our technological interventions. Such empathy leads to a deeper consideration of the plants' needs, emotions, and their significance as living organisms, potentially increasing awareness and appreciation for nature. This contemplative state encourages individuals to reflect on their sense of responsibility towards these technologies.

This exploration of genetically edited plants brings to the forefront ethical questions regarding the manipulation of life and the utilization of technology in natural processes for mass production. It challenges our traditional perceptions of what is organic versus artificial by showcasing the transformative impact of existing bioengineering technologies on nature. The narrative extends to the concept of living entities as data, highlighting that every human is identified by numerical values within various systems. This notion emphasizes our dual existence as both biological beings and data points, prompting a reevaluation of the complex interplay between humanity and technology. Moreover, the investigation remarks on the role of science fiction and imagination as conduits that connect our present reality with future possibilities, underlining the significance of rapid technological progress for both our current and future states.

Conclusion

"Imagination is more important than knowledge"¹⁴, Albert Einstein.

Nothing can be accomplished unless it is first imagined. The creation of my speculative world weaves the threads of our present reality with the bold conjecture of our future. Through my creative practice, I confront the pressing question of our era: to what extent should we intervene in the natural course of evolution using technology? This is not only a philosophical reflection but a call to consider what it means to live in a world where the overwhelming use of technology intersects with our need for control over our environment. In my work, I advocate for the fusion of nature and technology. It is a visionary projection of bioengineering integrated into wearable technology, extending beyond mere jewelry to serve as a manifesto addressing the current state and challenges of contemporary society.

As we revel in the inspiring possibilities of artificial intelligence and edited biological organisms, we must also confront the shadows they cast. The allure of our technological creations is undeniable, offering convenience, efficiency, and endless possibilities. However, we stand on the brink of potential addiction, loss of empathy, and an existential disconnect from the very essence of what makes us human. The unchecked proliferation of technology threatens to erode our connection to the natural world, replacing the healing embrace of nature with the cold efficiency of algorithms and artificial constructs. In this exploration of the evolving landscape of technology and nature, we must forge a new path—one that balances innovation with reverence for the natural world, one that nurtures our emotional bonds with our creations while preserving our innate connection to the earth. Our future—our very essence as sentient beings—hangs in the balance. It is time to make a choice: will we act as caretakers of our creations, or will we become

¹⁴ George Sylvester Viereck, 'What Life Means to Einstein', Saturday Evening Post (26 Oct 1929), 117. Reprinted in Viereck, *Glimpses of the Great* (1930), 447.

slaves to what we have made? The decision is ours to make, and the impact of our choice will be profound.

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