NEW INC Y12 Creative Science: *Gim Chaek*

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Extended Abstract

Project Description and Rationale

Gim Chaek—a transliteration combining the Korean words for "seaweed" (*gim*) and "book" (*chaek*)—is a multimedia project that investigates the entanglement of natural substrates, living bodies, and data transmission. Through layered natural and cultural cross-references, the project brings together natural science and the cultural repositioning of matter, using food, metabolism, and data streams as its primary conceptual and material frameworks.

The project is inaugurated through the fabrication of a bio–printed circuit board (bio-PCB, Soon *et al*. 2024), in which kelp extracts are used as conductive and structural material for wiring electronic components (*Figure 3*, *Figure 5*). From this initial prototype, ***Gim Chaek*** unfolds through multiple stages, including kinetic sculptures, speculative storytelling, and performative works. These successive forms function both as experimental platforms and as narrative devices through which the project materializes its hypotheses.

While seaweed has been investigated and developed across multiple areas of materials engineering—such as bioplastics, textiles, and architectural materials (Amandolese n.d.)—seaweed-based electronic components remain underexplored and are still far from widespread application. This project argues that the key challenge—and opportunity—is to co-utilize the durability demanded by electronic conductors with the flexibility characteristics of seaweed-based materials. (Aljarid *et al.* 2023) Central to this project are *gim* (Porphyra), *dashima* (Saccharina japonica), and several other sea algae—seaweeds that have long been cultivated (*Figure 2A*)and consumed within Korean culinary traditions ('K Gim Revolution' 2026).

Drawing on inspirations from history, natural science, and technology, the project begins with gim's physical resemblance to thin black paper (*Figure 2B*). This material analogy speculatively links the Joseon Dynasty (1392-1897)'s extensive documentation of governance and cultural protocols (Royal Historian 472 AD) with contemporary technologies of data storage and transmission (*Figure 2C*). By combining sea-farming practices, material engineering, and historical models of information technology, the project proposes a new approach to computer architecture that explores the potential for large-scale data inscription within organic matter (D'Onofrio and An 2010).

Outcomes and Future Perspectives

The inauguration of ***Gim Chaek*** is a kinetic installation presented at the New Inc DEMO2026. This large-scale sculpture-installation (*Figure 1*) demonstrates that a seaweed-based interface—specifically a bio-PCB—can wire and operate the key components of a robotic system (*Figure 4*), while still retaining the fragility and flexibility inherent to natural materials.

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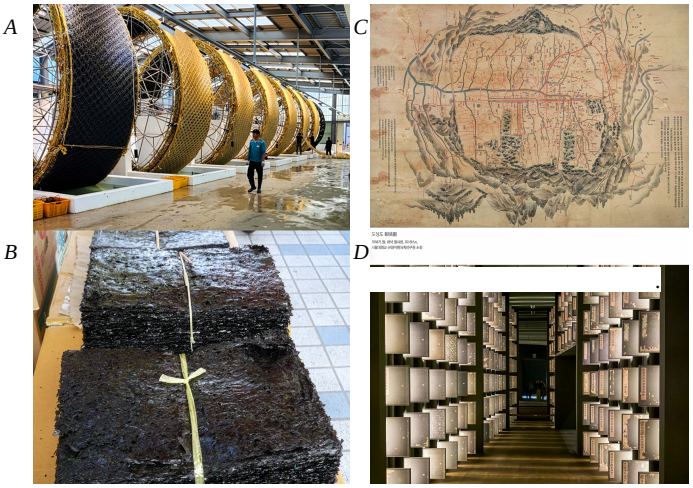
While the system employs automation and sequential control logic, the robots' movements and programmed electrical signals depend on the intentional imprecision and potential failure of the bio-PCB. This reliance opens space to question the role that malfunctions and glitches in living organisms (*Videodrome* 1983) play in durability, adaptability, and sustainability. The project further examines how irrational forces and material indeterminacy operate not as errors to be corrected, but as necessary conditions that exceed and destabilize computation. Pondering the human condition as a continuous negotiation between rationale and irrationality, the work turns to the body as a biological interface where such tensions are enacted through organic processes, reflecting Bataille's proposition that excess, transgression, and the limits of rational systems define human existence (Bataille 1995). In doing so, the project imagines a computational architecture and new algorithm that does not resolve contradiction, but sustains it—where ambiguity, excess, and failure are not errors, but operative conditions.

Creative Science Reflection

Rather than focusing solely on empirical solutions—such as the development of biomimetic design strategies—these artworks establish philosophical foundations for emerging technological systems by questioning the dominance of precision, optimization, and error elimination. By foregrounding what is typically excluded from scientific validation and computational logic—such as ambiguity, breakdown, and deviation—my artistic practice proposes interfaces, both organic and synthetic, that exist between the natural and the artificial. Through these hybrid interfaces, the work observes shifts in the identity of living organisms and examines how societal change interacts with and co-evolves alongside transformations in the evolutionary chain.



*Figure 1. Rendering of **Gim Chaeck** kinetic installation, 2026.*



(A) Gim farm, *The JoongAng*, October 24, 2023.
(B) Dried gim stack, *Wikipedia*.
(C) Map of Hanyang, 18th century, Gyujanggak Royal Library & Archive.
(D) *Dreaming of a Wise Reign*, National Museum of Korea.

Figure 2. Gim Cultivation and Material Histories of Data Inscription.

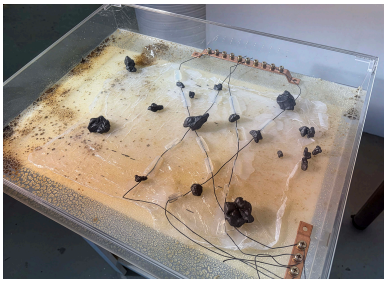


Figure 3. Physical concept drawing of bio-PCB, 2026.

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Figure 4. Apparatus, soft robot installation, 2020.

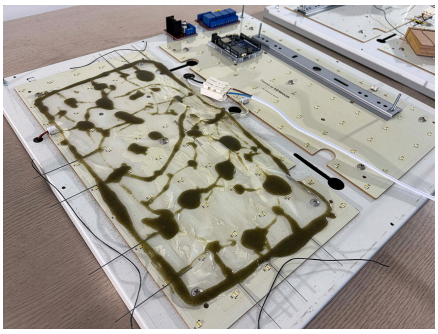


Figure 5. Physical concept drawing of bio-PCB, 2026.

Additional Information

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Competing interests.

The authors have no conflicts of interest to declare for this publication

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Declarations

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