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E-JOURNAL ON ART, SCIENCE AND TECHNOLOGY

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Emerging themes in the *Identifying Successful STARTS Methodologies* project and exhibition

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Date of submission: November 2022
Accepted in: June 2023
Published in: July 2023

Recommended citation

Doyle, Denise, Richard Glover, Martin Khechara and Sebastian Groes. 2023. «Emerging themes in the *Identifying Successful STARTS Methodologies* project and exhibition». In: Pau Alsina & Andrés Burbano (coords.). «Possibles». *Artnodes*, no. 32. UOC. [Accessed: dd/mm/aa]. https://doi.org/10.7238/artnodes.v0i32.407435

Abstract

In 2019 a team of multi-disciplinary researchers undertook a research project entitled *Identifying Successful STARTS Methodologies* (ISSM) (2019-2021) in order to analyze the innovative and collaborative strategies utilized by the global Science, Technology and Arts (STARTS) Prize Winners and nominees. The aim was to identify and articulate successful STARTS Methodologies through a series of interviews and in-depth case studies of the recognized projects. The project culminated in a series of case studies and an exhibition at the Made in Wolves Gallery at the University of Wolverhampton, UK, and further presented at the UK Garden of Earthly Delights at Ars Electronica in 2020. The project identified three emerging themes: the significance of building a new language of art and science through a third space, the process of anti-disciplinarity as an emergent form of practice, and the importance of different ways of knowing through art and science. A number of the case studies and themes are presented here alongside images from the exhibition.

Keywords

art-science; STARTS prize; *Treelab; This is grown; Library of Ourselves; The Murder of Pavlos Fyssas*

Temas emergentes en el proyecto y la exposición Identifying Successful STARTS Methodologies

Resumen

En 2019, un equipo de investigadores multidisciplinares llevó a cabo un proyecto de investigación titulado Identifying Successful STARTS Methodologies *(ISSM) (2019-2021) para analizar las estrategias innovadoras y colaborativas utilizadas por los ganadores y nominados a los premios Science, Technology and Arts (STARTS). El objetivo era identificar y articular metodologías STARTS exitosas a través de una serie de entrevistas y casos de estudio en profundidad de los proyectos galardonados. El proyecto culminó con una serie de casos de estudio y también con una exposición en la Galería Made in Wolves de la Universidad de Wolverhampton (Reino Unido), y se presentó en el UK Garden of Earthly Delights (Jardín británico de delicias terrenales) de Ars Electronica en 2020. El proyecto identificó tres temas emergentes: la importancia de construir un nuevo lenguaje de arte y ciencia a través de un tercer espacio, el proceso de antidisciplinaridad como forma emergente de práctica y la importancia de diferentes formas de conocer a través del arte y la ciencia. Aquí se presentan varios casos prácticos y temas junto con imágenes de la exposición.*

Palabras clave

arte-ciencia; premio STARTS; Treelab; This is grown; Library of Ourselves; The Murder of Pavlos Fyssas

Introduction

More than fifty years have now passed since the groundbreaking 1968 exhibition *Cybernetic Serendipity: The Computer and the Arts* at the ICA in London: a critical point in time that saw artists, scientists, and engineers explore the use of new technology for "creativity and inventiveness" (Reichardt, 1968). Since then, there have been intermittent developments in art and science collaborations, with the 21st century seeing a significant increase in interest in interdisciplinary practices. There have been some attempts to articulate a more comprehensive set of methodologies for collaborative science, art and technology research processes, although exemplars of cross-disciplinary collaboration have emerged "as a discrete paradigm in need of its own definitions, rules and recognition" (Wilson, Hawkins & Sim 2013, 41-49) (Malina 2011) (Malina, Topete & Silveira 2017, 2). In 2019, a team of multi-disciplinary researchers undertook a research project entitled *Identifying Successful STARTS Methodologies* (2019-2021) in order to analyse the innovative and collaborative strategies used by the global Science, Technology and Arts (STARTS) Prize Winners and nominees. The aim was to identify and articulate successful STARTS Methodologies through a series of interviews and in-depth case studies of the recognized projects.

The STARTS initiative is led by the European Commission and incorporates a number of related funded projects in Horizon 2020, including the STARTS Prize. The focus of the STARTS Prize is on high-end innovative collaborations between artists engaged with science and technology, and technology and science research laboratories open to bringing artists into the laboratory environment. The initial STARTS Prize ran for five years (2016-2020)[1] and each year two prizes are awarded: one for Artistic Exploration, awarded for artistic exploration and art works where appropriation by the arts has a strong potential to influence or alter the use, deployment, or perception of technology, and the other for Innovative Collaboration, awarded for innovative collaboration between industry or technology and the arts (and the cultural and creative sectors in general) that open new pathways for innovation. In addition, ten projects are given an Honorary Mention each year. The STARTS Prize aims to showcase achievements, encourage further collaborations and honour the inspiring individuals and teams involved.

1. Case studies of the STARTS Projects

After eight case studies were undertaken for our project, four were presented at the project exhibition at the Made in Wolves Gallery, University of Wolverhampton, UK in 2020, each having received Honorary Mentions

1. The STARTS Prize will run for another four-year term, from 2021 to 2024.

from the STARTS Prize. These were *Library of Ourselves* by the art collective BeAnotherLab (Honorary Mention 2017), *Treelab* by sound artist Marcus Maeder and tree physiologist Roman Zweiful (Honorary Mention 2017), *The Murder of Pavlos Fyssas* by London based interdisciplinary research agency Forensic Architecture (Honorary Mention 2019) and *This is Grown* by designer Jen Keane (Honorary Mention 2019).

2. *Library of Ourselves*

"How bizarre it would be to conceive of an I without an us" (Rizzolatti & Sinigaglia 2007)

2.1. Project description

Library of Ourselves is an interdisciplinary project used to create transformative encounters between communities in conflict. It was built using The Machine To Be Another – a highly adaptable Creative Commons system that bridges cognitive science and virtual reality techniques to creative empathic-driven experiences" (BeAnotherLab 2022).

2.2. Jury statement

The jury felt that the BeAnotherLab team was highly successful in utilising VR technologies as a true empathy machine – allowing the user to be placed into another person's body, and to experience the world through their eyes (STARTS prize jury 2017).

2.3. Case study

BeAnotherLab is an interdisciplinary art collective whose main base is in Barcelona, Spain although the group is distributed worldwide (Amsterdam, Paris, Zurich, Sao Paulo, and New York). The nine members of the collective are from wide-ranging backgrounds including Anthropology, Computer Science, Digital Arts, Cognitive Science, and Conflict Resolution. Dr. Denise Doyle visited the BeAnotherLab collective at their Hangar studio in October 2019, where she interviewed five of the nine members, and participated in a debriefing from two members of the Collective from their recent trip to Jordan where they were filming the stories of Syrian and Iraqi women refugees for a project based at the University of Birmingham, UK. The resultant immersive narratives will be added to the ongoing *Library of Ourselves* archive. Dr. Doyle went on to interview the remaining members of the Collective during the COVID-19 lockdown. One member of the collective, Philippe Bertrand, notes a number of "disciplines have investigated the interconnected empathic abilities behind the proverb 'to walk a mile in someone else's shoes' to determine how the presence, and absence, of empathy-related phenomena affect prosocial behavior and intergroup relations" (Bertrand, Schoeller, Gerry, Jain, Horowitz & Zenasni (2019). In their early works, the collective often used a short quote by Giacomo Rizzolatti, the neurophysiologist who discovered mirror neurons quoted above as a tagline for their research. In fact, the longer quote describes how the perception of emotions – of experiencing someone else's emotions – activates the same part of our brain as when we experience the same emotions ourselves:

> "Emotions, like actions, are immediately shared; the perception of pain or grief, or of disgust experienced by others, activates the same areas of the cerebral cortex that are involved when we experience these emotions ourselves." (Rizzolatti & Sinigaglia 2007)

This encapsulates the aims of BeAnotherLab in terms of their motivation and desire to encourage and enable empathy in others. The underlying conceptual logic of their approach is that through a better understanding of embodied cognition we can enable others to have a greater experience of empathy. Through the many interviews conducted, it became apparent that the most significant aspect of the approach of the group is their commitment to understanding embodied experience through the many fields that they inhabit. (Some have undertaken PhD-level research in neuroscience to "validate" their findings). Our case study further emphasises their shared belief in the ability to engender empathic responses in others through immersive virtual reality technologies.

3. *The Murder of Pavlos Fyssas*

"We think that artists also have a claim to truth. We understand that evidence doesn't speak for itself, we understand that we need to have interpretation, we understand that we need to represent. We need to make visible and explicit." (Varvia 2020)

3.1. Project description

"Shortly after midnight on 18 September 2013, Pavlos Fyssas, a young Greek anti-fascist rapper, was murdered in his home neighbourhood of Keratsini, Athens. Forensic Architecture were commissioned by the Fyssas family and their legal representatives to reconstruct the events of the night from audio and video material made available to the courts: the resulting investigation and report establishes a timeline and reconstruction of events that led to the murder, demonstrating the complicity of police – who were present at the scene before, during, and after the murder, but failed to intervene." (STARTS prize 2019)

3.2. Jury statement

By revealing state complicity with Golden Dawn in the murder of Pavlos Fyssas, this project continually and meaningfully encourages an increase in public dialogue on nationalism, immigration, and politics. The jury found that although the questions raised by the project were yet unresolved, they may be more relevant than ever in the current global-political moment (STARTS prize jury 2019).

3.3. Case study

Forensic Architecture[2] is an interdisciplinary research agency, based at Goldsmiths, University of London, that uses architectural techniques to investigate human rights violations and cases of state violence. Incorporating artists, photographers, videographers, sound engineers, and weapons experts, Jacob Badcock visited their studio in New Cross, South East London, to interview assistant director, Cristina Varvia, in January 2020. Taking their STARTS Prize nominated *The Murder of Pavlos Fyssas* as a point of departure, our case study focuses on Forensic Architecture's "archaeological" approach to media artefacts and the built environment, emphasizing their ability to make otherwise imperceptible acts of violence perceptible – to reveal that which is hidden through the close analysis of materials. Following their own self-reflexive analysis, we understand Forensic Architecture's practice as an "investigative aesthetics" which brings art to bear on the production of legal-juridical truths. Going further, we identify how Forensic Architecture collapses binary art-historical distinctions between the aesthetic and the epistemological: for Forensic Architecture, the artist, as much as the scientist, the mathematician, or the anthropologist, has a claim to truth.

4. *This is grown*

"I think it's imperative to have both a design perspective and a scientific one. One, to just validate the work, but also, I think, it becomes richer in the final outcome". (Keane 2020)

4.1. Project description

"*This is grown* was motivated by a frustration with plastics and a visible disparity between scientific research and design manifestations around natural materials. Taking an organism-driven approach to material design, the project began under the premise that a greater understanding of nature could help us not just replace the petrochemical based materials of today with more sustainable ones, but perhaps allow us to devise entirely new systems of making and categories of materials previously unimagined" (STARTS prize 2019).

4.2. Jury statement

This is grown is a project by Jen Keane that proposes a ground-breaking solution to our troubled relationship with nature. Working at the intersection of design and research, Keane has transformed her frustration with plastic pollution into an actionable idea for reducing the amount of plastic waste (STARTS prize jury 2019).

Figure 1. *This is grown* shoe (2018) designed by Jen Keane
Source: Photograph by Adam Toth. Courtesy of the designer

Figure 1 is a photo of one of the shoes designed and "grown" by Keane as part of her project. Taking an organism-driven approach to material design, the project began under the premise that a greater understanding of nature could help us not just replace the petrochemical-based materials of today with more sustainable ones, but perhaps allow us to devise entirely new systems of making and categories of materials previously unimagined.

4.3. Case study

Our case study investigates the nature of the interdisciplinary working and collaborations between artists and scientists in this project, focused on biological alternatives to synthetic materials. Several interviews were carried out to create dialogue for later qualitative analysis; these conversations included reflections on the very nature of and relationships within the collaborative context and cognitive space formed that facilitated creation. For ease of interpretation and to gain a deep perception of the views of participants that reflect the nature of relationships in art/science collaborations a simple thematic analysis approach was chosen to interpret the data and begin to answer the research questions set by the project and develop a conceptual framework to better understand and represent the data. Coding allowed the development of three themes under which perceptions from interviewees could be grouped that reflected the nature of collaborative activity between artists and scientists. The three themes identified were; emotions, technology, and knowledge. These reinforce each other and converge to create the transformative intersection where art and science meet and the collaboration occurs. This relationship is not simple and involves a quasi-state or epistemic super positionality that requires further investigation. Keane's collaboration came about through meeting scientists from Imperial College London during her MA Material Futures course at the University of the Arts in London, UK through the bio-design challenge that she

2. Forensic Architecture received the Ars Electronica Golden Nica award in 2021 for their project *Cloud Studies*.

took part in. We considered how a successful collaboration formed between Keane and scientists Tom Ellis and Marcus Walker, of Tom Ellis Labs, resulted in a transformative space to develop her work and evolve her practice. She also identifies where the two fields meet the outcome can be something other than when they are considered or used individually, something richer is produced when they are used together at the intersection of practice.

5. Treelab

"I want to create an experience of the abstract term 'climate change'. An experience that is shareable. Once you've made this experience of a suffering tree, you may be able to discuss that with others who experience the same art installation". (Maeder & Zweiful 2019)

5.1. Project description

Treelab's project *Rendering Ecophysiological Processes Audible* sought to connect sounds that occur in trees with ecophysiological processes and thus investigate how to create perceptible experiences of plants that are not noticeable to humans (STARTS Prize 2017).

Figure 2. Spatial audio version of trees: *Pinus Sylvestris*
Source: courtesy of Marcus Maeder and Roman Zweiful

5.2. Jury statement

The jury was impressed with the unusual pairing of a plant physiologist and a researcher in computer music and sound technology in their endeavour to bring the unheard sounds of trees to the surface. Their collaboration resulted in a joint research project on complex environmental data collection and sonification (STARTS Prize 2017).

5.3. Case study

In September 2019, Richard Glover flew to Zurich to interview tree physiologist Roman Zweifel, and sound engineer Marcus Maeder. As their collaborative project Treelab developed, the researchers realised that if they could make stress-induced plant signals perceivable to humans, an abstract concept like climate change can be made tangible through an installation environment. Through qualitative analysis from interviews, this case study explores the different roles played by the collaborators, and the consequences for their own distinct academic fields. Maeder's approach is underlined by his philosophy that artists and scientists meet on a "different plane" to one inhabited by either party; this different plane best facilities cooperation by both researchers. The task for artists is to develop a common language with scientists through an engaged study of their discipline, which can take considerable time – two to three years in the case of Treelab. Zweiful acknowledged the deep interaction that arose from Maeder's desire to understand the meaning behind the scientific data, rather than simply translating it as material to be employed in artistic work. Equally, Zweiful acknowledges the artistic realisation as a much more effective mode to facilitate heightened public understanding and impact of the urgent environmental data, in comparison to standardised journal publication routes. Maeder similarly recognises the importance of shareability of the installation experience, to prompt further discussion and exploration. The case study emphasises the shared understanding by both researchers, from very different fields, that for public presentation to bring about societal change, a transition to the *emotional* is necessary. During the interview there was a resistance to certain kinds of Artists-in-Lab approaches where an artist enters the lab and treats the work environment as a supermarket, in order to consume – rather than engaging with the task of reading scientific materials. Artists can use the labs as inspiration for new materials, for new artwork, and scientists are left questioning the benefits for themselves. In Treelab, however, Zweiful recognises the knowledge Meader has gained from the reading, describing the "scientific level" where Maeder can bring new ideas; this "scientific level" is based upon a deep understanding of the scientific phenomena at hand, and is much more expansive and welcoming of the experiential, emotional elements needed to engage and challenge public understanding (Maeder & Zweiful 2019).

5.4. Emerging themes

The project identified that through this process of interdisciplinary collaborations, three themes emerged:

1) Building a language between art and science

A number of the artists and scientists who work together over the long term describe how they have to build a "third space" or have to meet on "another plane" in order for them to communicate and find a common language. Anthropologist and member of the BeAnotherLab Collective, Norma Deseke, notes that the collective have developed

something akin to what she terms "code-switching" (Deseke 2020), in that they need to learn other specialist languages and terms such as those used within the language of neuroscience and the language of the arts. Deseke further suggests that the experience of the collective being geographically spread across the world means that this, alongside the range of art and science disciplines that they draw from, that they "are a [form of] third space in that regard" (Deseke 2020). As noted above in the collaboration between Maeder and Zweifel in Treelab the collaboration between them was undertaken over a period of two to three years and this was the time needed in order to establish the shared language between them. Maeder argues that any long-term collaboration as an artist engaged in science means developing a real knowledge of the scientific discipline. In that way, the artist needs to understand the language of the scientist, but in turn, the scientist needs to understand the language of the artist and this, as Zweiful acknowledged himself enables the science to be communicated in more accessible ways (STARTS prize 2017). The language built between art and science in the work of Forensic Architecture also builds on the notion of shareability through public exhibition but in turn attempts to unearth the truths that lie hidden within media forms. Further to this, the artist too has a claim to truth as much as the scientist or the mathematician.

2) Anti-disciplinarity as a form of emergent practice

Through the case studies undertaken, there is evidence that there is an emergence of anti-disciplinary practices that do not fit within existing academic disciplines. These practices sometimes develop by necessity – with manifold methodological and theoretical approaches required to address complex problems (i.e., climate change). Other projects are anti-disciplinary by design such as *This is grown* discussed further below. Joi Ito, whilst Director of the MIT Lab, noted that anti-disciplinarity is about working in spaces that simply do not fit into any existing academic discipline – a specific field of study with its own particular words, frameworks, and methods (Ito 2014). BeAnotherLab member Christian Cherene commented that by working in these spaces inbetween different fields you have the possibility of expanding the fields themselves, and "hopefully change them as well because they're problematic in their own ways". Cherene alongside his fellow BeAnotherLab members work hard to challenge existing biases, and he notes that "I think we realise the limitations of our own disciplines and the failings and the implicit biases that are in there, what it discounts" (Cherene 2019). Approaching practices from the perspective of working outside of existing disciplines moves some way towards this. Jen Keane, in *This is grown*, is developing a science-informed design practice and epitomises Ito's view of the outcomes of an anti-disciplinary approach as a methodology inherently creates new fields of practice. Her view of the intersection of two practices is where something richer emerges and as the two fields meet the outcome can often be something other than anticipated or previously considered by either researcher. Finally, whilst the work of Forensic Architecture is less motivated by anti-disciplinarity and more focused on the interrogation of media forms through a form of "investigative aesthetics" to uncover "the truths" held within them, their work inadvertently contributes to the anti-disciplinary methodological dialogue.

3) Different ways of knowing

As the COVID-19 pandemic highlighted we are dealing with a time of great complexity and uncertainty and there is a need to work in new ways to solve global and societal issues. It is critical for the arts and humanities – in conjunction with the sciences – to embrace different ways of knowing, enabling greater insights for meeting the challenges of the contemporary world. The methodologies and collaborations in art, science, and technology that support the work presented in this exhibition further attest to this. The concept of *different ways of knowing* was highlighted during an interview with BeAnotherLab member Marte Roel who has studied both and MA in the arts and a PhD in the sciences in order to further understand embodied experience from both perspectives. Embracing both empirical 'ways of knowing' from the sciences and at the same time embracing an ontological and artistic understanding of the body as a form of a subjective "almost liquid entity that is boundless," Roel's openness to both disciplines offers a very different form of understanding to embodied experience and one that offers advances knowledge in embodiment studies (Roel 2020). Forensic Architecture's research epitomizes different "ways of knowing" enabled by different disciplines joining together such as an artist, a videographer, a sound engineers, and a weapons expert providing a rich and media archaeological approach to knowledge production. Keane notes that in her investigation of creating new forms of materials for *This is grown* through her background in material science and bio-design she argues how imperative it is to have both perspectives: a scientific one and a design perspective, each offering different ways of knowing simultaneously.

6. The ISSM exhibition

The threats of the COVID crisis have also brought about new opportunities such as participating in a distributed Ars Electronica Festival in 2020 and this actually prompted us to host our project exhibition early in order to showcase the work of the project alongside some of the winners and honorary mentions of the Prize. The exhibition was originally intended to showcase the interim results of the project at the project conference in early July 2020. Due to the COVID-19 pandemic, the conference had to be cancelled. However, an opportunity to be part of the Ars Electronica Festival 2020 in Linz, Austria virtually through the UK Garden of Earthly Delights presented itself and the exhibition was installed in the University's Made in Wolves Gallery at the main campus in July 2020 until June 2021 (Ars Electronica 2020).

From the STARTS Prize 2020, we were keen to host the work of Taiwanese artist Pei-Ying Lin, given the immense global impact that COVID-19 was having. Her project *Virophilia* investigates the possibilities of human-virus encounters and comes from a very simple question: can

we start to see the connotation of viruses differently, especially those that cause infectious diseases? Lin explains further in her project description. As a biological definition "viruses, unlike bacteria, are not considered as 'living'". Viruses themselves are not equipped with the essential components that can facilitate their replication. In other words, Lin continues, "viruses cannot replicate themselves. They are doomed to be the 'parasites' on living creatures, and [the] human is one of them" (Lin 2022) . One part of the installation is a 7 metres high scroll that lists all known viruses in the world, with space for more to be added (STARTS prize Jury 2020).

Figure 3. The ISSM exhibition featuring *Virophilia* installation. Source: Photograph by Denise Doyle

Figure 4. *The Influenza egg on rice* recipe in the *Virophilia* cookbook
Source: Pei-Ying Lin. Courtesy of the Artist

Another part of the *Virophilia* project installed in the exhibition was a cookbook written for the 22nd century where humans have learnt to live with and accept viruses as part of a greater ecosystem. The project investigates the possibilities of human virus encounters in the realm of food culture, via events and performances that open new discourses and perspectives. In the opening pages of the book, written in June 2068 in Amsterdam she writes: "this cookbook is written to show the non-biased, intention-free relationship human beings can have with viruses which were not considered useful but are, in fact, fascinating" (Lin 2020). Of note is the *Influenza egg on rice*, but equally there are many strange combinations in the cookbook itself (see Figure 4).

Figure 5. The installation of *Future Flora* at the Made in Wolves gallery
Source: Photograph by Denise Doyle. Courtesy of the Artist

Also included in the exhibition was an installation of the *Future Flora* project by Giulia Tomasello and a shoe and some material examples from the *This is grown* project by Jen Keane, presented above. Tomasello was awarded the Grand STARTS Prize for Artistic Exploration in 2018 for her innovative project. Figure 5 features the installation of *Future Flora* containing the harvesting kit Tomasello designed for women to treat and prevent vaginal infections (Tomasello n.d.). *Future Flora* aims to encourage the symbiotic relationship that raises the beneficial presence of microbes and bacteria in the human body, suggesting an alternative: to wear probiotics and keep our body healthy. It is aimed at women who wish to take control of their own bodies as a precious and intimate practice of self-care. The Jury Statement for the project begin:

> "Through the thick digital forest, there was a distinctive and loud call for returning to nature, attention to life, biology, the self, the body – especially empowering the female body and its sexuality which came as no surprise after a year of #MeToo. Responding to this collective consciousness wave, the jury agreed that *Future Flora* embraced the issues of reclaiming female power – with DIY and no shame – in a way that could prove empowering to others seeking to find a voice." (STARTS prize jury 2018)

Tomasello celebrates the female biophilia and argues that we should open up the possibility of wearing microorganisms in the future and embrace them as part of our natural well-being. Taking care of her own health, and becoming a citizen scientist, establishes the relationship between a woman's body and what is part of her living surroundings. Clothes and accessories become the ecosystem that balance the entire skin microflora.

Conclusion

The IRIS initiative was developed in order to encourage cross-faculty interdisciplinary research at the University of Wolverhampton, UK, and to create strong international partnerships that could withstand the challenging years of research funding ahead outside the EU. The Director of European Collaboration at Ars Electronica, Veronika Liebl, noted that the project promised "to bring valuable insights and knowledge of the versatility of these STARTS collaborative practices, consequently helping STARTS to improve future measures in encouraging processes between artists, scientists and technologists" (Liebel 2020). Future research aims to test these emerging themes and outcomes in a series of artist-scientist residencies in order to further support this interdisciplinary work in arts, technology and science that can have a real societal impact.

Acknowledgements

Thank you to the University of Wolverhampton, UK for the financial support through its International Research and Innovation Scheme (IRIS) in order for this research to be undertaken, and for the support to travel to Spain, Switzerland, and Holland in order to undertake some interviews face-to-face.

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