

Application to the Beyond Academic Publication Workshop

Authors of the **Beyond 5G: Envisioning the Future of Mobility in Japan Through Design Fiction**:

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Who we are

At the DLX Design Lab, our research pushes the boundaries of academia through our unique, multidisciplinary project outcomes. Grounded in the idea of creating value through design, DLX partners with laboratories at the institute of industrial science (IIS) at the University of Tokyo in order to find value in the intersection of science and design. We call this Treasure Hunting; and this process is fundamental to our explorations. As a laboratory at the IIS, our interdisciplinary researchers and designers have an understanding of the academic rigour needed to fully realise speculative design projects. With this in mind, our team has worked on projects spanning from citizen science projects on microplastic collection, to completely speculative projects on what the future of mobility in Japan holds. We do this through a rigorous process of finding value and meaning alongside other IIS labs, researching through hosting international workshops, and prototyping quickly to bring ideas to life. In this reflective piece, we will highlight the process, successes, and next steps of one of DLX's most recent projects: Beyond 5G. Through this, we will explain why DLX's unique interdisciplinary position facilitates a strong hub of alternative research outcomes. During the Alternative Outcomes of HCI research Workshop, we hope to share the exciting outcomes from the Beyond 5G Project, learn more about other lab's methods and outcomes, and brainstorm ways in which we can create a showcase of future artefacts across multiple labs, at upcoming design shows.

Recent Work

During DIS '23, our lab will be sharing our work into developing and visualising future mobility scenarios in Japan. Commissioned by the National Institute of Communications Technology Japan, our team of researchers explored how 6G communications technologies would affect the future of mobility in the upcoming decade. During this project, we completed several sprints, including a research phase, ideation phase, and prototyping phase. The outcomes of this project resulted in the consolidation of our ideas into four speculative futures. These futures were further realised through the creation of physical artefacts from the future, videos depicting future scenarios, and finally interactive exhibitions to gather feedback from a diverse audience.

Research

Our team of design researchers originate from multiple countries, with diverse professional backgrounds. From architecture to product design to engineering, we each bring a unique perspective on what it means to employ design fiction as a means to build narratives around future scenarios. We also saw value in completing a considerable amount of secondary research before diving into building our futures. In doing so, we learned about key technological enablers of 6G, and determined which qualities differentiated it from 5G, and what qualities were optimisations of 5G. We also learned more about social, economic, and environmental trends in Japan, and how these trends were expected to develop in the next two decades. Once this research was completed, our team sought to develop conceptual futures through a participatory workshop. We created three future scenarios which each aligned with a different trend in Japan as well as personas of the range of people that may interact with these futures:

TWO Japans 	Business as Usual 	The Quantified City 
<p>Congratulations! You are the prime minister of Japan. You inherited a country where half of the population lives in a few megacities; and the other half is scattered across a very environmentally diverse and low density territory. Infrastructure is saturated on one side and it's dying on the other. It's almost like you are serving two different countries.</p>	<p>We live in a place where natural disasters are so common, they no longer make the headlines. We don't notice 45-degree heatwaves, earthquakes, tsunamis, and typhoons, as cities are able to cope with these conditions by design.</p>	<p>It's 2032. There's already seamless integration between us, the city and the vehicles on the road. This allows us to measure and process everything in real time, with an unseen level of granularity for every interaction. Just as a smartwatch is now an accepted tool to track and make sense of our health, an interconnected territory can also sense the "health" of the city.</p>
<p>How do you connect these two Japans?</p>	<p>What does the infrastructure in these disaster-proof places look like?</p>	<p>What do you sense and how do you react?</p>

There were over 30 workshop participants from the University of Tokyo ranging from students to professors to researchers. All the participants engaged in world building activities based on their assigned future and personas. One of the positive outcomes of this exercise was that it engaged a diverse audience of researchers to engage with a technology outside of their own research field. One consideration point of the workshop is that our method for attempting to gather unbiased sentiments resulted in the creation of ambiguous, uninformed futures.

Ideation

To understand how to generate futures that would extract value from both technical and social insights, we completed another round of research. After this, we focused on placing workshop-generated ideas onto a canvas that positioned a concept based on its reliance on 6G technology (Y-axis), versus what Japanese values or challenges this concept addresses (X-axis). From this matrix, we measured each idea based on five qualitative scales. These dimensions allowed us to qualitatively address ideas with rigour. We asked the following:

Robustness: How context dependent is it?

Addressability: How many people is it addressing?

Availability: How does the user interface with the idea?

Seamlessness: How much behavioural change is required?

Feasibility: How feasible is in terms of cost, time frame and technology?

After this, we consolidated our ideas into four possible futures, with each future encompassing a key question. The developed futures and questions were as follows:

Future 1: Digital twin for emergency responses to natural disasters

What if the infrastructure becomes responsive?

We imagined a future scenario in which a network of 6G antennas could provide real time updates and feedback to a digital twin of a city, which could be critical in developing disaster response in natural disaster-prone countries such as Japan.

Future 2: Remote taxi driver

What if the future of transport lies in the outsourcing of driving capabilities?

With the hyperfast network connectivity and reliability of 6G, it will be possible to outsource remote driving on a global scale. This comes at the advent of autonomous driving, where passengers may admire the capabilities of autonomous vehicles, yet the technology is not yet affordable or widely trusted.

Future 3 : Intuitive navigation

What if navigation apps are rendered obsolete, as wayfinding is implicit to the environment?

With the increased precision of 6G versus 5G, it will be possible to locate people, places, and objects down to the centimetre. What does this mean for how we navigate, especially in new environments?

Future 4: Rural 6G

What if public transportation was as convenient as private transport?

In this future, we imagine how we can engage an older generation with revolutionary technology in an approachable manner. We developed the concept of a new on demand transport system, which provides access to autonomous shuttles with a low-tech aesthetic.

Since our initial publication was accepted into DIS '23, our team has developed four short films to give dimension to our futures, and several public-facing exhibitions. We invite you to explore these four futures as well as watch our short films on our project [website](#). We would like to include these four videos as our supplementary material, which are one of our many alternative research outcomes.

Interest in the Beyond Academic Publication Workshop

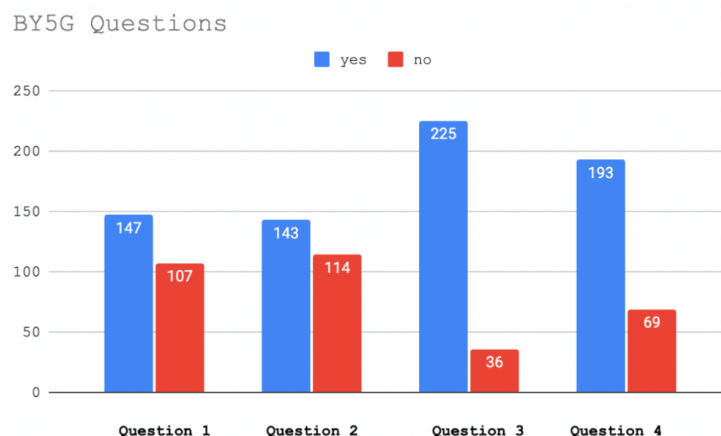
In her 1965 essay entitled “The Imagination of Disaster,” Susan Sontag writes of the necessity of props in science fiction: “Things, objects, machinery play a major role in these films. A greater range of ethical values is embodied in the décor of these films than in the people. Things, rather than the helpless humans, are the locus of values because we experience them, rather than people, as the sources of power. According to science fiction films, man is naked without his artefacts”. Similar to science fiction narratives, speculative futures rely on artefacts to convey worlds which may never exist. Our lab aims to utilise this form of world building to help diverse audiences understand how future technologies will confront societal norms

and values.

We are extremely keen on attending the Beyond Academic Publication Workshop because we are curious to learn more about other laboratories' approaches to developing artefacts and other alternative outcomes. This avenue of outcome is especially difficult in a field that gives so much merit to publishing and dissemination of information narrowly within academic circles. With our outcomes at DLX, we are interested in engaging and interacting with public audiences, as these are the audiences for which we expect our future scenarios to impact. One example of how we have engaged public audiences was by creating interactive voting systems at our exhibitions. At our first exhibition at the Urban Design Council of Kashiwa-no-ha, we engaged an audience with four provocations which they used physical tokens to vote with. The questions were as follows:

1. Would you agree to provide your device with your precise location at all times in exchange for a seamless navigation experience?
2. Would you use a remote driving service in your personal car?
3. If public transport was available from your front door at any time, would you use it instead of your personal car?
4. Would you follow an automated system to navigate you away from danger?

After the exhibition, we added up the votes of over 250 participants, and determined the final results:



In the Beyond Academic Publication Workshop, we would love to continue discussions on our voting outcomes, the design of interactive installations, and encouraging discourse within the scope of technological innovation.