DIGITAL TOOLS FOR THE CITY OF THE FUTURE

If design is both a mechanism and a methodology to anticipate the future, then it can be understood as a predictive instrument. Each time we design something we are showing a way in which the future could unfold. For more than a decade, the MIT Senseable City Lab has been crafting the future, using design and technology as instruments to shape cities.

Palabras claves
Diseño
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Universidad
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Economía colaborativa

Keywords
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Laboratory
Sharing Economy

Urban space is increasingly blanketed by layers of networks and digital information, which are ushering in new approaches to the study of the built environment. Started in 2004, at a time when new networked technologies were entering physical space, the MIT Senseable City Lab aims to study these changes from a critical point of view, exploring how they could affect the way we understand, design and ultimately live in cities.

The convergence between bits and atoms we were imagining around ten years ago is now a reality and has opened up the new field of Internet of Things (or IOT). In order to explore it, the Lab brings together over 50 people from all over the world. Each researcher has a different personal history, different skills and a different cultural background. Most of them come from architecture and design, but we have also mathematicians, economists, sociologists, physicists – as a testament to an omni-disciplinary approach.

Such diversity allows the mission of the Lab to express itself. We start from Herbert Simon's words on design, which he put forward in his book *The Sciences of the Artificial*: "The natural sciences are concerned with how things are... Design, on the other hand, is concerned with how things ought to be" (Simon, 1981). We like to see the Lab as a place that contributes to the exploration of how things ought to be.

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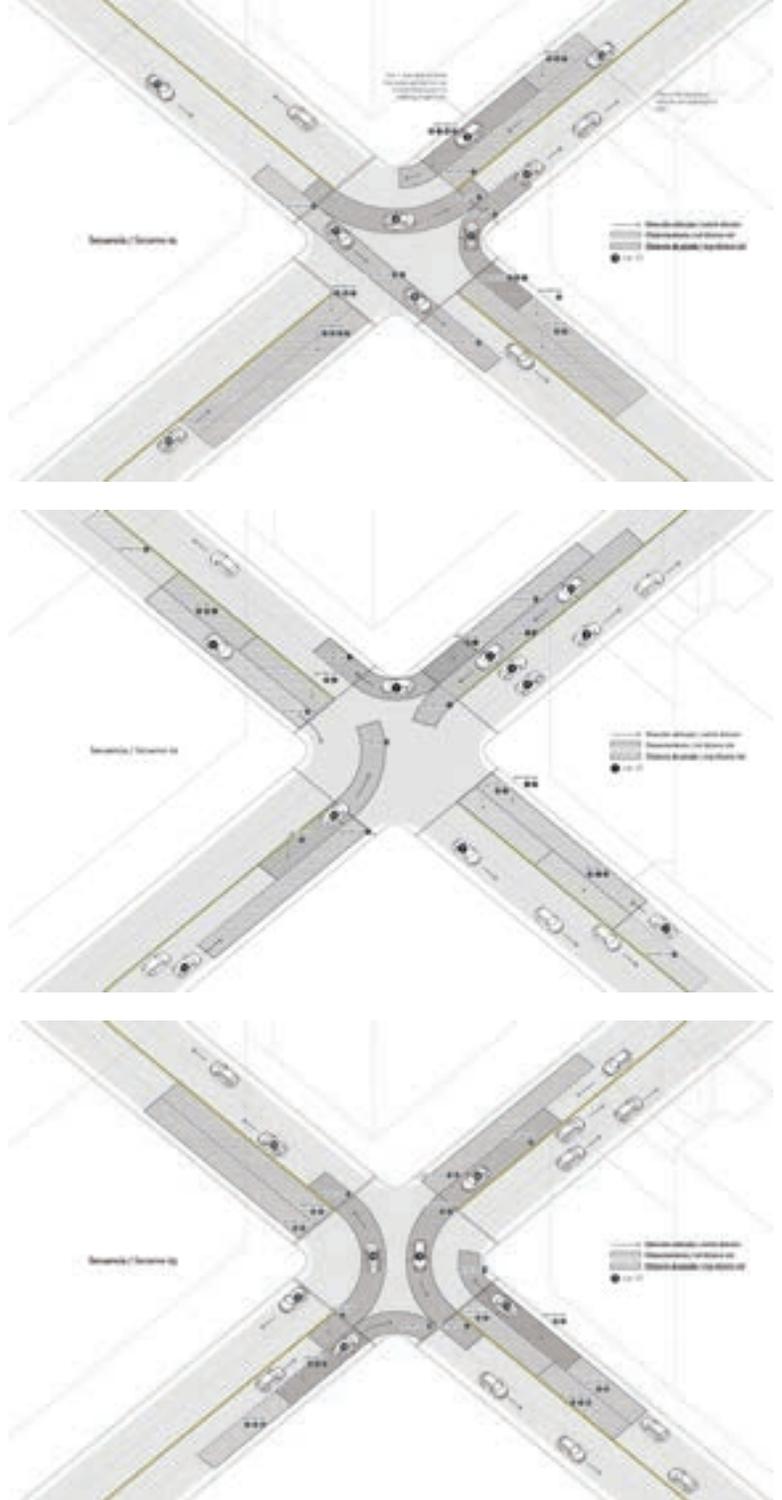
If we were to use an evolutionary analogy, we could talk about the production of mutations in order to accelerate the transformation of the present. Such approach is what we have called 'futurecraft' in our latest book, *The city of tomorrow* (Ratti & Claudel, 2016). We believe that design can be used as a systematic germination of possible futures, intervening at the interface between people, technologies and the city – developing research and applications that empower citizens to make better choices about where they live.

Futurecraft has led us to several projects at the intersection between the digital and the physical realm.

FIGS 1A-1C Light Traffic. Diagrama de intersecciones./ *Diagram of street crossings.* © MIT Senseable City Lab

Applications are manifold: from mobility to health, from air quality to waste management. We consider our projects as the 'instruments' that allow us to explore the potential of today's cities. For instance, let's look at sharing mobility. Cars are idle 95% of the time, so they are an ideal candidate for the sharing economy. It has been estimated that every shared car can remove from 10 to 30 privately owned cars form the street. Also, the impact of car sharing will grow exponentially with the advent of self-driving. Self-driving vehicles promise to have a dramatic impact on urban life, because they will blur the distinction between private and public modes of transportation. 'Your' car could give you a lift to work in the morning and then, rather than sitting idle in a parking lot, give a lift to someone else in your family – or, for that matter, to anyone else in your neighborhood, social-media community, or city.

A recent paper by the Massachusetts Institute of Technology's SMART Future Mobility team shows that the mobility demand of a city like Singapore – potentially host to the world's first publicly-accessible fleet of self-driving cars – could be met with 30% of its existing vehicles. Furthermore, other researchers in the same group suggest that this number could be cut by another 40% if passengers traveling similar routes at the same time were willing to share a vehicle – an estimate supported by an analysis of New York City Taxis share-ability networks.
The above implies a city in which everyone can travel on demand with just a fraction of the number of cars in use today. Such reductions in car numbers would dramatically lower the cost of our mobility infrastructure and the embodied energy associated with building and maintaining it. Fewer cars may also mean shorter travel times, less congestion, and a smaller environmental impact (you can access some of our results at: http://hubcab.org).

However, this is not the only possible outcome; we might have more dystopian scenarios, for instance, if self driving were to become so cheap that people would prefer jumping into a car than, say, taking the subway. In that case our cities could easily turn into gridlocks. Robin Chase, the co-founder and former CEO of Zipcar, went even further by writing of "zombie cars – those with no one in them – clogging our cities and our roads." Her vision foresees unemployment for professional drivers, lost revenue from our transportation infrastructure and "a nightmare of pollution, congestion, and social unrest" (Chase, 2016).

How to cope with such different outcomes of the same technology? Again, our proposal is to use design to test them, compare them and start a critical discussion – then letting society making a choice. This, in essence, is futurecraft. **ARQ**

FIG 2 HubCab.
Captura de pantalla mostrando lugares de origen y destino de los 170 millones de viajes en taxi durante un año en Nueva York. / *Screenshot showing pickups and drop offs of all 170 million taxi trips over one year in New York City.*
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FIG 3 HubCab.
Captura de pantalla mostrando flujos de taxis y potenciales beneficios compartiendo taxi entre dos ubicaciones en Manhattan.
Screenshot showing taxi flows and potential taxi sharing benefits between two locations in Manhattan.
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