

Design for the age of
augmentation

Fall 2019 Innovation Incubator
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Hyperreality is coming.

When it arrives, it will fundamentally transform our cities and places. This transformation could drastically improve our degrade our human habitat. **It is our responsibility to help guide technology and society toward a positive augmented future.**

Hyperreality Defined



↑
Symbol obfuscates object.
Inspiration: adaptation of
"Ceci n'est pas une pipe" by
Renée Magritte³

Hyperreality, for the purposes of this study, is a theoretical state in which non-real, augmented objects blend so seamlessly with physical reality that they obfuscate the original nature of reality. Reality and augmentation blend into one perception.

Originally defined by French sociologist and philosopher, Jean Baudrillard, in his book *Simulation and Simulacra*¹ the concept of hyperreality describes all instances where a symbol overtakes the object that it originally described.

Hyperreality, as originally defined, can describe our current reality in many ways. Capitalism is one type of Hyperreality. The value of money is endowed by a common collective belief in the value of money. Money is a symbol that represents the value of useful goods and services. In capitalist society, the symbol of money obfuscates the actual goods and services that the symbol is intended to represent.

The concept of hyperreality has inspired the works of many visionary thinkers in the realms of art and design.

Keiichi Matsuda, designer and film maker, explores how our physical and virtual realities have merged in his short film entitled *Hyper-reality*². Matsuda paints a jarring picture of an environment plastered with graphic overlay, media, and advertisement. The film follows a main character through a normal day in this hypothetical future reality. Her extended reality platform uses points, levels, notifications and challenges to guide her through every aspect of her life. Instead of having a stable job, she uses her virtual assistant to get suggestions for different gigs to earn money. Her extended reality system warns her to avoid traffic, notifies her it's time to step off of the bus, connects her with a personal shopping request, and guides her to each item she needs to pick up. The virtual world has overtaken the physical, leaving no surface safe from digital content.

Hyperreality is coming.

Hyperreality is the logical destination for the trajectory of current extended reality technologies.

“Extended Reality” describes all technologies that augment a person’s sensory experience. It encompasses the realms of Virtual Reality, Augmented Reality, and Mixed Reality, all of which describe varying levels of sensory augmentation. Extended Reality technologies have been rapidly developing, and with recent massive investments from tech companies like Facebook, the development shows no sign of slowing.

Virtual Reality describes technology that visually immerses the user in a new artificial environment⁴. The physical surroundings are blocked out and replaced with new content. Products like Google Cardboard, HTC Vive, and Oculus Rift are some of the most well-known of this type of product.

Augmented Reality describes simple visual overlay onto our field of vision, superimposing physical reality with digital content⁴. Augmented Reality content is not interactive – the digital content does not interact with the physical environment. Ikea has an augmented reality mobile app that overlays a 3D model of their furniture onto your phone’s camera feed.

Mixed Reality describes the next level of augmentation, where digital content is blended with the physical environment through the use of tactics like tracking and visual occlusion⁴. A digital character could “hide” under a physical coffee table.

Extended reality apps have gained popularity as they become better at creating believable and dynamic overlays. Google Maps⁵, for example, has recently released an update that enables a mixed-reality version of wayfinding directions. The app uses the camera to recognize the surroundings and locate the user in real-time, real-space. The app then gives step by step directions with arrows overlaid onto the live camera feed. The app has even promised that it will next overlay an augmented cartoon fox that will lead you to your destination. No more reading maps, now you can simply follow the fox. The app will even tell you when to put your phone down when you approach an intersection.

Instagram and Snapchat have led the pack in mixed-reality filters for photo and video social media posts. These apps can alter the user’s appearance, apply styles to your surroundings, etc. A broad community of developers creates custom filters of every type, for people of every narrow interest and hobby.

Magic Leap, a Florida-based tech company, is currently offering a suite of mixed-reality business apps and artistic experiences enabled by a wearable headset.

Microsoft HoloLens offers a wearable headset and operating system with a host of mixed reality gamess and helpful applications. Video games on the HoloLens will display characters approaching the user from their surroundings, rounding corners and popping out of walls.

Extended Reality technologies will enable extreme augmentation of our perception and abilities.

These technologies will potentially transform life as we know it by giving users seamless access to digital content in real-time, overlaid and woven into their physical experience. The physical and virtual worlds will blend into one. Useful digital information currently reaches people through physical devices with screens – a smart phone, a laptop. In the future, the “screen” will tend to become smaller, more transparent, less noticeable.

If we consider the “stream of consciousness” that we recieve from our senses, extended reality technologies can interact with that stream of consciousness in different ways. Technology can supplement that stream of consciousness with new and useful content, similar to notifications. That stream of consciousness, however, can also be modified by the same process. Instead of overlaying new graphical information, we could instead morph/edit the visual content our eyes are already receiving. The same applies to our ears.

The current field of “biohacking” also gives us a glimpse of the creation of merged or new senses⁶. Through cameras, sensors, and software, we could translate visual content into audible content. One could “hear” colors if their wearable technology translates colors into different frequencies or types of sound.

As architects, designers, and planners, we have the responsibility to guide these technologies toward a positive augmented future.

Our professional obligation to protect the health, safety and welfare of the public extends into this new augmented realm.

Although architects are paid by clients, our primary obligation is toward the public. We are stewards of the physical realm, and we advocate for positive outcomes inside and outside of our project work. Within projects, we serve to represent the voice of the community within the design process. We implement processes to include those stakeholders that might otherwise go unheard.

We also create many sets of laws to help regulate the process of architecture to ensure a positive built environment. Building codes impose safety and construction standards for projects. There are laws that govern how energy efficient buildings must be, laws to ensure that the materials used are safe, and laws to protect structural integrity. Each project much undergo critical review by local authorities for compliance with these laws before projects are allowed to be built.

Beyond the laws, we impose additional regulations and rating systems to help our built environment strive for higher performance. Sustainable rating systems like LEED and WELL provide ways to measure how environmentally responsible our projects are. Communities will also create systems to ensure a consistently high design quality for projects within jurisdiction. Design Review Boards critique the design of projects to help create a cohesive sense of place.

Entire fields of study analyze the design of physical space from many different perspectives. When selecting the color of interior walls, we rely on correlations between colors and psychological states. Colors can create calming moods, support a strong appetite, or increase our perceived energy.

All of this energy is spent because we as a society value the quality of our built environment. We all agree that we want our human habitat to be beautiful, high-performing,

safe and non-toxic. New technologies will continue to make the virtual realm increasingly physical. With this shift, it brings with it the question: Who are the stewards of this virtual realm?

Architects, designers and planners are the best suited to understand the nuanced challenges that lay ahead for the combined virtual/physical environment. We have processes and methods in place for making sense of physical challenges. It is time to reframe our responsibility of “stewards of the built environment” to “stewards of the human habitat.”

In order to advocate for a positive outcome upon the arrival of this technology, we need to agree on the shared values that should drive the process. What is a positive Hyperreality?

Elements of a Positive Hyperreality

A positive Hyperreality is one that supports the broader goals of society.

Social Purpose

A positive hyperreality is a shared hyperreality. It brings people together instead of dividing them into their own personal bubbles. It brings social interaction back into the physical realm from the digital realm, strengthens empathy, and contributes to stronger communities.

Sustainability and Resilience

A positive hyperreality is one that helps people live in harmony with their natural environment. It helps sustain human life on earth without detriment to the quality of life of future generations.

Diversity and Inclusion

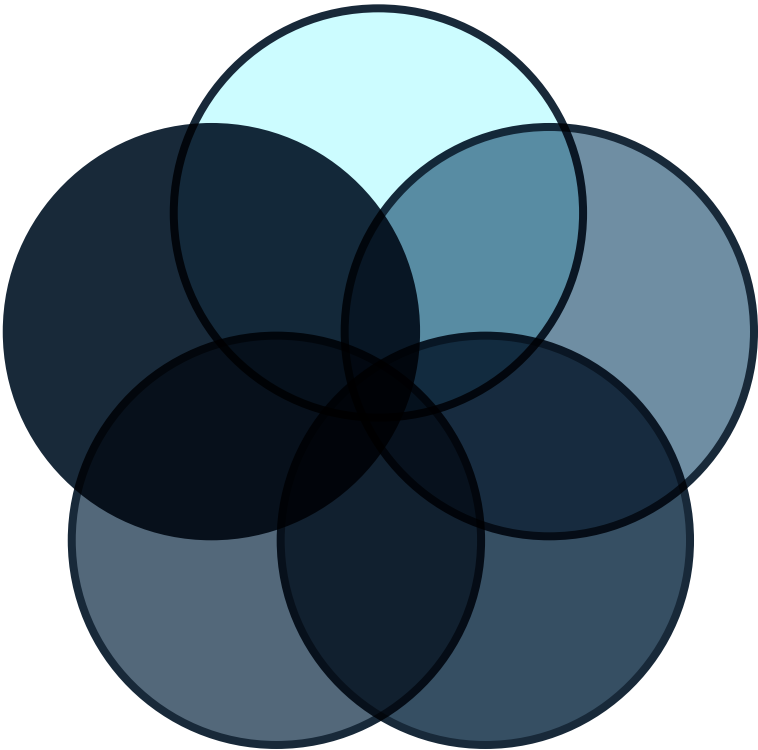
A positive hyperreality promotes a vibrant, diverse society that is inclusive of all people regardless of their age, culture, ethnicity, gender identity, language, physical ability, race, religion, sexual orientation, size, or socioeconomic status. It is accessible to all.

Well-Being

A positive hyperreality makes the human habitat healthier for people, both physically and psychologically. As more of our waking reality is designed instead of natural, we need to understand our psychological needs to ensure they are being fulfilled.

Design Excellence

A positive hyperreality creates a more beautiful, high-performing waking reality. The virtual realm and the physical realm are becoming one. We need to treat each, and the collective whole, with the utmost care.





Visions of a Positive Hyperreality

- Urban Design**
Impact on our cities
- Mobility**
Impact on transport
- Architecture**
Impact on buildings
- Interiors**
Impact on spaces
- Risks of XR**
What's at stake

Creative minds from throughout the US and Canada came together to create a vision for a positive Hyperreality at all scales of impact.

This design charrette allowed us to collectively speculate on what the future might hold. We began with the shared assumption that, in the future, extended reality would be advanced and ubiquitous. In our hypothetical Hyperreality, an XR device (wearable, contacts or other) would allow everyone access to a shared virtual environment. In this environment, content could be seamlessly overlaid and merged with the physical environment. The platform would be multisensory - including at least sight, hearing and haptic.

Participants contributed to a number of different curated discussion prompts that addressed the different scales of impact from Urban Design to Interior Design. The result of the charrette was a shared vision of a positive hyperreality that we have summarized in the following pages.

- Participants:
- Perkins and Will San Francisco (all staff)
 - Lorena Knezevic, Perkins and Will Miami
 - Damian Ponton, Perkins and Will Miami
 - Maryam Ahmadi, Perkins and Will Vancouver
 - Yehia Madkour, Perkins and Will Vancouver
 - Saeed Ahmadi (PhD Student, North Carolina State University)
 - Julia Beabout (CEO, Novaby)
 - Michael Austin (Urban Planner, City of Bellevue, Washington)

Photos:
San Francisco office comes together with coalition of XR enthusiasts to brainstorm.



How could XR improve Urban Design?

INTRO

Hyperreality will have broad and sweeping impacts on Urban Mobility and Urban Design. As the physical and virtual realities merge, it will enable new answers to our everyday questions for what it takes to design a great cityscape. Not only will our cities be augmented, but that augmentation, over time, will affect physical change at an urban scale. Some of the parameters that affect the shape and scale of our cities will change. These changes can be positive if they are properly guided.

PARTICIPATORY DESIGN

Hyperreality will open up a new channel of correspondence between city and civilian. People will be able to share their opinions about their surroundings in real-time, allowing planners to understand specifically what works and does not work for the people affected by their designs. This would be a powerful tool of participatory design. During entitlement of a property, a virtual model of a proposed development could be displayed within the collective hyperreality. As people walk past the property, they could select from a number of options or share their opinion. With more information, better decisions could be made.

Saeed Ahmadi, Ph.D. Canditate in the College of Design at North Carolina State University, is currently developing an AR app to empower people to share their community needs. Using his app, people can select physical elements from a library, overlay them onto their camera feed with AR, and share the final image in a common social advocacy platform⁷.

PHYSICAL POTENTIAL OF HYPERREALITY

If access to a shared hyperreality is ubiquitous, this could shift the way that urban environments grow. Many of the underlying parameters controlling urban design will remain the same, but some will change. For example, the comfortable distance that a person can walk will remain, but that person will be able to easily determine fairly complex walking routes with the help of XR mapping.

One of the benefits of an orthogonal city block is that it is imagable and understandable. It is easy to describe directions to a place in these terms, using only how many blocks north and how many blocks east, for example. In a hyperreal city, we may

always follow GPS information that is overlaid onto our field of view. With that capability, we could navigate more complex development patterns. Perhaps the city of the future looks more like Rome or Paris than New York, with angular street patterns and planning that has more to do with placemaking and less to do with easy wayfinding.

The physical space of cities can become dynamic with hyperreal technology. Seamless XR overlay will allow us to have clear and dynamic signage to control usage of our spaces. For example, designated times can be assigned to allow or disallow vehicular traffic. If you arrive at an intersection in a vehicle during the morning or evening commute, your augmented traffic signals allow you through. If you approach the same intersection during work hours, you may be presented with an augmented barrier, denying entry to vehicles. Pedestrians, however, do not see the barrier. With the many US cities lacking in plazas today, the technology can allow using XR as a viable option to reclaim vehicular streets as primarily pedestrian spaces. This wouldn't just be a change in the use of space, but a change in the way that many streets are designed. If we can design for people first and vehicles second, we can use better materials with more human scale.

Then, there is biophilia and the beautification of a street. For cities that may be lacking in greenery, but may not afford the upkeep of plants, there can be an overlay that creates experiences within a city. This can enable our man-made environments to feel more natural, and allow for the exploration of new ways to use our existing urban spaces. Otherwise uncomfortable spaces, through augmentation, may be quite enjoyable. Overall, the effect is a higher utilization of our existing infrastructure.

Also with XR, there comes the opportunity to communicate more effectively through visual stories. Many people have trouble visualizing the very real environmental problems that we face. If XR helps tell that story, maybe we can more often build consensus to create sustainable built environments. The Exploratorium of San Francisco has employed this strategy with a mobile app-based AR experience that shows residents of San Francisco where the sea level would be at their location with unmitigated sea level rise. This has been employed as a means of raising public awareness and support for the funding of the Sea Wall.

PEDESTRIAN EXPERIENCE

Time in front of a screen is at an all-time high. Many people scroll on their phones while commuting to work, stare into a monitor for 8 hours, and then return home to watch TV before heading to bed. This results in a human reality where the majority of our waking time is within the digital reality of our 2D operating systems. Hyperreality has the potential to take all of that activity and make it physical again. This dissolves the barrier between us and our environment, making information access intuitive. We will then access each other and information the way that we evolved to interact with our environment. Our urban spaces will come alive with the content of the internet, the social information of instagram and facebook, and the shopping suggestions of google. All friction between information and physical reality will diminish.

With XR, comes the chance for more connections with others and encourage interaction in the built environment. For example, say people using the XR have their public profile and things they would like others to know about them. This can open up opportunities to have conversations with people you did not know have similar interests as you initially. Gamified city experiences can help people learn more about their community with others as well as share suggestions. XR can help you make the best out of your outings. With suggestions of what's around the corner based on your plans for the day, or types of activities you may be interested in. This can allow for better awareness of local events happening near you as the system of XR will grow in line of more personalized, data-driven technology.

MOBILITY

Whether we are walking or driving, we started with paper maps and progressed to use GPS apps for wayfinding. With the capabilities of XR technology, reality and mapping can visually become one as we are currently seeing with Google Maps. This allows for less distraction when traveling and better comprehension of your path. XR can play a big role in promoting sustainable travel and can make taking transportation much easier. Information overlay will help make getting to your destinations clearer by updating you on train, tram, or bus times. With the growing use of ride-sharing apps, pickups will be safer with better pick up

location avoiding the impact on traffic. Besides wayfinding, other information can be overlaid to assist wayfinding such as terrain slope, traffic, sun/shade, and weather. People will be better informed and will have ease of knowledge about where they are going. If you are thinking to go grocery shopping, the technology can recommend that there is a sale on an item you often purchase, suggestions like these can also help in promoting local businesses. In a hyperreal environment, the XR platform will likely use AI to deeply understand your personal buying preferences and will make suggestions for you as you navigate your day. The mapping updates can also assist others such as emergency access vehicles. XR will help responders receive real-time visual instruction to avoid traffic jams making them get to their destinations faster.

XR overlay will also provide relief to experiential challenges brought on by other future technologies. Autonomous vehicles, for example, may be capable of moving far faster than is comfortable for many people. If autonomous vehicles are linked together on a common network, they may not even need traffic signals whatsoever. Using slight adjustments, they may narrowly avoid collision with each other like bees in a swarm. If this sound nauseating, you're not alone. There may be necessary multimedia overlays on the vehicle windows that play as a source of stimulus while in transit. With XR, these commutes can also become more productive. For example, consider conferencing or working during a commute. XR can allow access to a large interface and making working from your seat an easier process. Conferencing capabilities will also ease communication for meetings and reduce the need to commute.

Information overlay could increase pedestrian safety by providing warnings that are either visible, audible or sensory. Mobility will be easier for those with disabilities. Imagine customizable interfaces that may communicate through various means of sensory. XR will help you travel places you cannot travel to, reducing the need for mobility. The technology can also assist in minor inconveniences such as stepping in dog poop. For climates with rough winters, the technology can warn for patches of ice up a road ahead increasing safety.



How could XR improve Architecture?

XR will improve the design and delivery process, enabling better buildings.

By and large, buildings have been designed, documented and delivered in similar ways for hundreds, if not thousands, of years. Architects design projects using representational drawings and models, then produce an extensive set of 2D drawings to communicate the project in sufficient detail to be built. The authorities review those 2D drawings for compliance with all applicable laws and codes, then the builders use those documents as an instruction manual to build the work. This process takes years, and involves many opportunities for inefficiency. An XR-based workflow would potentially reduce these inefficiencies, enabling better design, better decisionmaking, and a direct connection between design intent and construction.

Currently, the design of buildings occurs on a desktop screen that displays a 3D model of a project. The designer can “zoom in” and “orbit” but can generally only view the true scale of their designs at an early level with a VR headset. It is sometimes difficult to imagine how large something is without seeing it in perspective at 1:1 scale. If the modelling could occur within that VR or XR “real body” environment, the designs that are produced would have a much stronger connection to human scale and human experience of space. Yehia Madkour, Director of Innovation at Perkins and Will Vancouver, has already implemented a VR-enabled process allowing designers and clients to navigate through virtual environments⁹.

As the tools for design become more intuitive and more experiential, the gap between what we can imagine and what we can draw becomes smaller. Users will collaborate to build the project in a virtual environment. Optimally, the interface would provide instant feedback during design regarding building code requirements, environmental performance, fire safety, etc. If the BIM model that we build could instead be analyzed and permitted by the Building Department, and used by contractors with XR devices, there would be less opportunity for mistakes.

If our design workspace is a shared virtual environment, multiple designers and clients could make real-time changes together in a highly collaborative way. While architects and designers have the ability to imagine space while looking at drawings, many people struggle with that. XR will level that playing field and allow better communication and decision-making.

XR will enhance our experience of built architecture, supplementing it with new spatial content and creating new fields of design.

During the Visioning Session, concern was raised that if we have the ability to change the appearance of buildings with XR, that buildings would tend to be designed as “white boxes” to receive future XR overlay. Lorena Knezevic and Damian Ponton from Perkins and Will Miami pointed out that even in a Hyperreal state, the physical requirements of architecture will remain the same⁸. Buildings will still need to provide shelter, deliver natural light and ventilation and views to interior spaces, and respond well to their climactic and site conditions. XR overlay will be, by its nature, supplementary to architecture.

A building owner could procure two designs – one for the physical building and one for the digital overlay of that building when viewed from a common XR platform. Imagine a digital “veil” that overlays onto building. Because there will always be those that do not use XR technology, digital design overlay will not substitute for architectural design, but will be supplementary. A digital veil for an architectural project could have a realistic appearance or could be decidedly immaterial/ephemeral. It could pretend to be bound by the same laws of physics as its surroundings, i.e. gravity, or could defy the laws of physics. There is no reason that a digital XR veil over a building would need to be static – it could move and change based on the day, the weather, or user data input.

XR will spawn entirely new fields of architectural design that do not currently exist, and entirely new markets for architects that are capable of delivering that type of work. There will be “places” that are entirely digital, with limited or no physical infrastructure, integrated into our cities. Imagine an initiative from a City to increase utilization of its public parks and plazas. The City could commission XR architects to design a different experiential concept for each of these places. One park could have perpetual perfect digital snow and aurora borealis, regardless of the season or latitude. Another park could host XR bioluminescence and otherworldly vegetation.

Non-visual XR will enable new types of delightful, spatial experiences for those that are differently-abled. Your XR wearable could detect spaces and compose an audible landscape to allow an acoustic experience of space.

XR will remove the barriers to good design, and cause an actual physical improvement to built architecture.

As a case study, we can explore the potential of XR to free the physical environment from the responsibility of hosting advertisements. This is already happening in a significant capacity in many project types. The *Hyper-reality* short film predicts a world plastered with static digital billboards and advertisements.

By 2017, the combined advertising revenue of Facebook and Google surpassed the combined advertising revenue of all print media on the planet¹¹. People are consuming increasingly more and more advertisements, but those advertisements are becoming more helpful due to their use of targeted user data. Advertisements increasingly feel less like billboards for random products, but suggestions for things that we truly like and would not have necessarily found for ourselves. This type of advertising is far more effective per dollar spent, and has the potential to make print and physical advertisements mostly obsolete. There are, of course, physical advertisements that will remain. These are advertisements that are place-specific, such as advertisements for medical products in a hospital lobby, or advertisements for luxury products¹¹.

We can see the effect of XR on advertisements in stadiums and arenas. In these spaces, the venue is broadcast to millions of viewers throughout the world. That exposure makes the building a very valuable host for advertisers, so many of these buildings have traditionally been plastered with advertisements and billboards. More and more, however, digital AR billboards and animated graphics can be overlaid onto the camera feed of an arena or stadium. This means that it actually becomes more beneficial to have a physical building free from advertisement so that it can be added/adjusted in post-production. The ads that remain are catered specifically for the fans that are attending in person – they are more experiential. Branded experiences and environments have skyrocketed in popularity for these spaces because they are much more impactful ways to engage with fans. The effect is that stadiums have fewer cheap billboards, focus more on better design, and have branded experiences instead.

There is some fear that, if XR content is overlaid onto all of our buildings, that there will no longer be an incentive to create beautiful architecture. This “blank slate” design would be intentionally constructed to receive digital content. In general, people have used every invention as an artistic platform throughout the entirety of our history. The need to eat became cuisine. The need to relate to the passage of time became music. The need for shelter became architecture. This new technology can not change the fundamental spirit of humanity to create beauty. More likely, we will find new and exciting ways to create harmony between the physical and virtual architectures.

XR will not replace building safety elements, but will supplement them. This will lead to safer buildings.

XR will expand the ability of the blind, deaf, and differently-abled. Imagine a device that, using machine vision, tracks where a blind user walks via a consistent camera feed. The device would tell the user via a vibration on their right wrist or in their right ear if they are walking toward a hazard on their right side. This type of technology would pair with physical safety elements throughout buildings to give greater access to the differently-abled.

An XR platform would also offer helpful information to people in the event of a fire or other disaster. If an XR platform collects the data from the collective use of the same platform, it would have an immense amount of spatial data on buildings. Your wearable or other device could potentially learn the floorplan of your office or your home, and help you navigate to safety in the event of a fire. People tend to memorize specific paths through a building and use those paths even when shorter ones are available. XR could help overcome that bias.

Currently, the California Building Code allows exit stairs to accomodate more occupants in a building if that building is equipped with a voice-alarm system. In that way, XR technologies could have an impact on the design of buildings if they provide a recognized benefit to all the people occupying a building.



EN ROUTE

JANE SMITH
32 MUTUALS
ADD REQUEST
MESSAGE

How could XR improve Interiors?

XR might enable better, more beautiful workplace environments.

Currently, Microsoft Hololens offers a wearable headset that serves as a replacement for a traditional monitor and mouse. The “screen” is projected in midair in front of the user, and intuitive hand gestures can be used for many purposes of a current mouse. A physical keyboard, however is still technically required to do most things with this platform. If we imagine that speech-to-text platforms improve and link with this type of device, the keyboard may be the next item on the chopping block.

This opens the possibility of an office free from much of that physical infrastructure. One would not necessarily need a desk, but still may choose to sit at one if they have physical components that they use for work. This would drastically reduce the need for desks, and challenge the open office layout that is so pervasive today. Maybe the office of the future can focus more on creating comfortable spaces for people to spend their day, and better places to come together as a team.

An XR-first workflow would also create the need for new types of spaces that don’t currently exist. XR will have exciting new implications for video conferencing, allowing teams to come together in holographic form to work. This would hopefully allow teams to overcome the “body language” barrier to conferencing. New types of conference rooms would need to be designed specifically for this.

This type of conferencing and workflow will help alleviate complexities of working remotely. If more people work from home, then more employees could be served by less built office area. It could also help teams navigate “in-person” meetings without travel, which could significantly help reduce the carbon footprint of business flights.

XR could also improve the design quality of office interiors by introducing virtual design elements into the environment. Living walls, indoor biophilia, water features, beautiful light features, could all be added digitally at little cost, with no construction. These virtual design elements would achieve at least some of the experiential and emotional benefit as their physical counterparts.

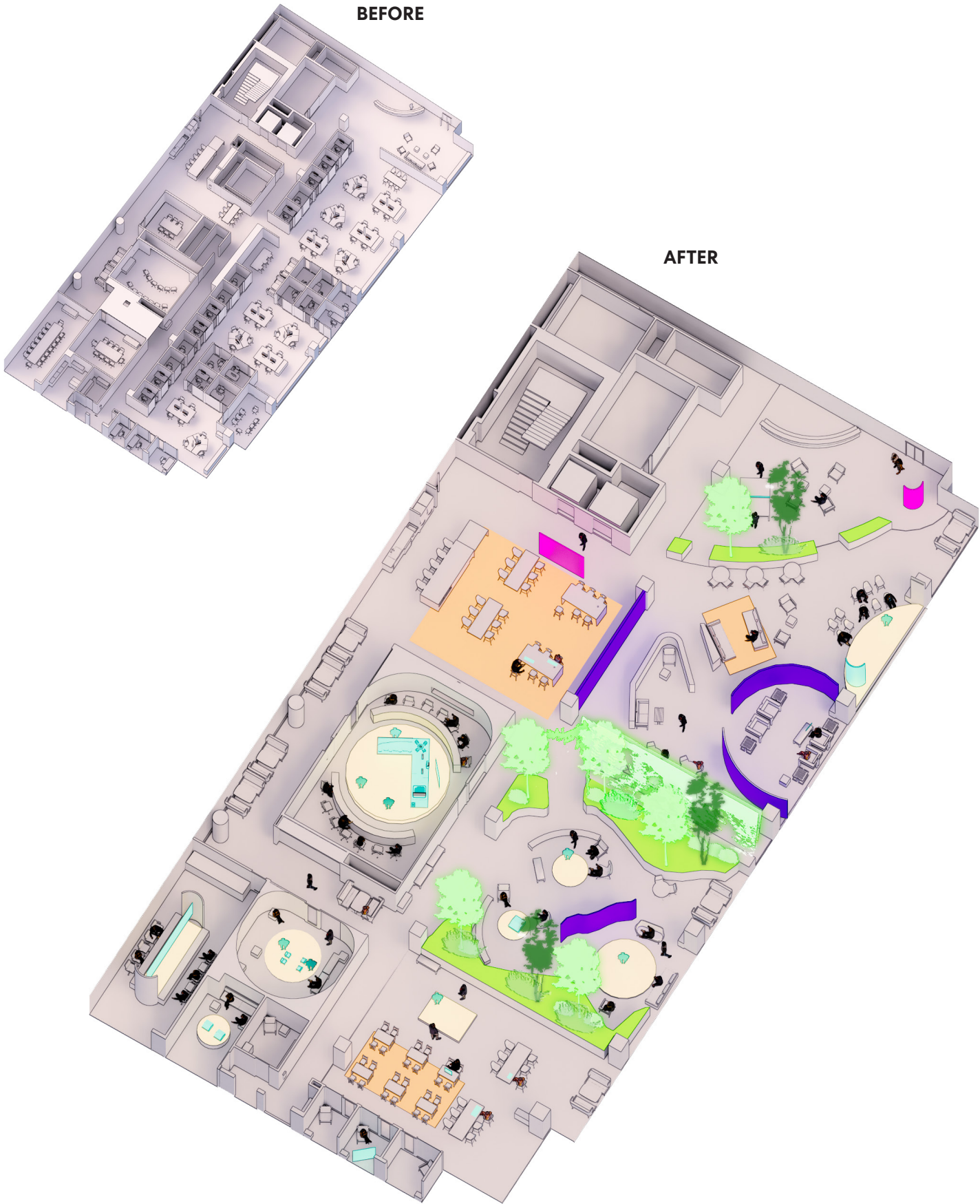
XR might lead to fantastic new types of hospitality experiences.

Virtual architecture is not bound by constructibility, budget, structure or fire resistance. Imagine a fine dining restaurant that commissions a virtual experiential environment that pairs with the meal. The first course arrives – sea urchin on fennel flower custard. The floor begins to fill with virtual sea water that sloshes around the feet of the patrons. Leaves begin sprouting from the walls and the ceiling, growing into green twigs before blooming all at once into a blanket of yellow fennel flowers. Virtual bees buzz from flower to flower, pollinating, and you realize that there is a hint of honey in the custard.

The design of interiors would benefit from design process improvements implicit in an XR-first workflow.

By using XR to engage clients in the design of spaces, interior designers can create more customized and efficient spaces. This has great potential in spaces like hospitals, where the ergonomics of an operating room could mean life or death for patients. By allowing the surgeons to enter a virtual model of their future OR before it is built, the surgeon can experience first-hand the arrangement of the various equipment.

This effect will also be felt in residential projects. A person’s home is a highly personal and emotionally significant place. A shared virtual modelling environment could allow clients to see the design of projects evolve and help make more experience-based decisions.



What are the risks of Hyperreality?

INTRO

During the Kickoff Charette, Gerry Tierney pointed out that this technology is standing at a fork in the road. One path leads to an equitable and well-designed experience, and the other path leads to a dystopian future like Keiichi Matsuda’s “Hyperreality.” We can use two technology case studies to understand the possible trajectories of Hyperreality. The first is the Internet, and the second is Autonomous Vehicle Technology.

In the early days of the internet, we saw an explosion of new and useful websites. We also saw an explosion of advertisements - new ways for companies to reach people. Those with harmful motivations found new ways to exploit the strengths and the weaknesses of the technology. More recently, it has become apparent that, while the internet is the most powerful source of information ever invented, it is also the most powerful source of *misinformation* ever invented. Governments and independent groups are using the internet and social media to spread targeted misinformation as a way of manipulating the public into actions that are not in their best interest. Until these effects are felt, they are not counteracted by regulatory agencies or consumer behavior.

On the other hand, the autonomous vehicles seem to be on a different trajectory. Early on, people anticipated the risks of autonomous transport - not only to people but to cities. Architects, urban designers and planners formed research groups like the Perkins and Will Mobility Lab to define the goals and lead that industry with proactive regulation toward the positive path. The same can and must be done for XR.

The importance of having this conversation now cannot be understated. The more we can understand the risks of the technology before they become reality, the more we can mitigate those risks.

PSYCHOLOGICAL RISKS

Hyperreality will create a waking experience much different from conditions in which we evolved. Before we create the most powerful experience-altering technology ever invented, we need to have a deep understanding of our own psychological needs to ensure that those needs are met. There is, however, a real possibility that the Hyperreality will

arrive before we have sufficient understanding of our own needs. How, then, do we assess the long-term risks?

For example, it may be possible to offer every person their own personal hyperreality. The world that a person sees around them may be a completely different world than the person next to them sees. How would people relate to one-another in that type of environment? It may lead to social isolation and reduced social connection among communities.

Consider a slightly different scenario - there are many different hyperrealities that people can choose from. There is a hyperreality for everyone that they can share with people from all around the world. Algorithms could learn individual interests over time and suggest content based on those interests - but the content will be a modification of our perceived surroundings. This could amplify the current phenomenon of “social media bubbles” and cause a rise of extremism from constant exposure to positive feedback from our peers. In social media, the net effect is a disassociation from the truth. In hyperreality, the net effect may be disassociation from reality itself. If you can’t tell what is real and what is augmented, does it matter?

An uncontrolled Hyperreality could also lead to a maximalist nightmare full of advertisements and flashing content designed to catch our attention. It is easy to see how life in that type of environment would have an elevated risk for stress-related illness and anxiety.

SOCIETAL RISKS

The fabric of society depends on a shared understanding of objective reality. If XR allows people to bend their environment to their will, it introduces a level of subjectivity never before possible. How will people operate in an objective reality if they experience it as malleable?

Furthermore, XR may cause a disassociation from the physical world altogether and a preference instead for the augmented version of the world. Those people may no longer have a desire to improve their physical surroundings. Why would anyone care about the upkeep of their neighborhood if they never see the grit? This blurring of the boundary between real and augmented reality may tend to

lessen the perceived value of our physical surroundings and lead to an associated decline in engagement.

Inequity is implicit - some will not have access to this technology and others will. In the beginning, inequity will be greatest as access to the Hyperreality expands according to the Law of Diffusion of Innovation. Like we have seen with other new technologies, those that have access will have immense advantages over those that do not. We currently live in the time of the highest wealth inequality in United States history¹², and this could exacerbate that problem. Uncontrolled inequality poses a real risk to the fabric of society.

Trust is the bedrock of how people relate to one another. Hyperreality will pose a challenge for building trust with one another. Currently, if we would like to access information or processing, we at least need to look down at our device to navigate. With XR, we will never know what type of information other people are overlaying, and it deepens a divide with the people we come across. If you are on a first date, you may think that your companion is very charismatic. You might be dismayed to find that they have installed an app that displays real-time suggestions for how to guide the conversation. What makes our real-world engaging is our shared experience. The lines of hyperreality are blurry and can bring about more societal isolation and lack of trust.

COMMERCIALIZATION RISKS

Hyperreality will depend on a ubiquitous, comfortable XR platform that overlays every moment of a person’s experience. The platform will be extremely attractive for advertisers, who will see this as an opportunity to market directly to everyone with user-specific advertisements. Left unchecked, this could overpower the waking experience with an unending cascade of augmented pop-up advertisements and illusions. This would not only be a waking nightmare, but would be potentially dangerous if it distracts us from our surroundings. If advertisements cannot be kept from this shared hyperreality, care must be taken to limit the amount of visual field that is allowed to contain advertisements, the pace at which advertisements are allows.

A platform like this would be a powerful data-collector to fuel hyper-specific targeted content. Potentially everything that you experience, every time your glance lingers, could be recorded and fed into algorithms that learn who you are and make suggestions to guide your behavior. This, other than being a gigantic data privacy concern, would lead to a decline in serendipitous experiences. With more and more suggestions based on our past behavior, we will be less likely to choose to patronize businesses that may be outside of our wheelhouse. This will put many businesses, especially small businesses, at risk if they are not able to adapt.

SECURITY RISKS

This type of XR use could expose us to manipulation and attack from those that wish to harm or control us. As discussed earlier, Hyperreality would be potentially the most powerful disinformation tool ever invented. If those with bad intentions gain control of the content in that platform, they could use that content to strategically control public opinion. We may not be able to distinguish whether or not our opinions are authentic or whether they have been crafted over months of slight suggestions and false content.

If this environment can be “hacked” it will open up the possibility of augmented terrorism. If a terrorist group is able to gain control of people’s platform, they may issue dangerous overlays or harmful visual content. A platform-wide attack would be very dangerous.

FREEDOM RISKS

Who owns the Hyperreality? In many ways, the best parallels we have for this would be either the internet or the actual environment. If one entity owns the hyperreality, it would be an incredible amount of centralized power, which would be an innate threat to individual freedom.

How could we regulate Hyperreality?

INTRO

The technology that enables hyperreality is being developed by a narrow set of companies with similar motivations. The governments that have the power to enact regulations on this industry are poorly-positioned to understand the type of regulations necessary until the impact of new technologies have already been made. Hyperreality will be a global phenomenon, and as such, regulation will need to consider the local governments and cultural norms of each nation.

It is going to be important to have a variety of well-informed outsiders be a part of the tech conversation. The extents that hyperreality can have an affect on our bodies, our psychology, our society, our cities, our education, our jobs and so much more shows the importance of this dialogue. The language and standards for hyperreality's regulation need to be discussed among our many community leaders and this includes architects, designers, and planners.

HOW CAN IT WORK AND WHO HAS A SAY?

The tech industry itself has made calls to be regulated by the government. Lack of regulation makes tech the wild west and gives space for monopolies and large companies to take in smaller ones disproportionately. Currently, when looking at the United States, the country has approached tech from a state by state case¹³. This approach does not seem to prepare us for the global effects brought on by shared hyperreality.

SELF-REGULATION

What if we were to take the route of hyperreality being regulated by its own industry? Even in a completely unregulated environment, market forces and consumer decisions would regulate the Hyperreality. Basically, if the hyperreality is known for overwhelming people with advertisements, fewer people will opt-in. Likewise, if a hyperreality is already ubiquitous and it turns out to have negative health impacts, people will opt-out. Knowing this, an XR company may self-impose regulations that help them retain sight of the consumer's needs, as a way of preventing these negative consumer reactions. One problem is that, in many capitalist markets, there are systematic incentives in

place that prioritize short term profit over long-term success. This is a challenge for the ethical conduct of every industry, not just XR.

Similarly, Non-Governmental Organizations, or NGOs, may impose regulations accross the XR industry to mitigate the risks of Hyperreality. NGOs have become increasingly active and powerful as traditional governments struggle to keep pace with technological advancements. These organizations could use political pressure to get companies to agree to a set of regulations, and then impose fines/fees in the event that those regulations are disregarded.

REGULATE AS MEDIA

In the United States, the Federal Communications Commission, or FCC, has jurisdiction over communications industries including radio, television, and the internet. In the case of the internet, the FCC has historically acted to protect consumers from internet providers and tech companies by enforcing "net-neutrality" rules. "Net Neutrality" is the principle that Internet service providers should enable access to all content and applications regardless of the source, and without favoring or blocking particular products or websites¹⁴. FCC ruled multiple times to oppose companies from intentionally slowing down certain traffic, or even trying to prevent customers from installing their own routers to access the internet. Recently, however, the FCC has changed position and instead ruled to allow internet service providers to block or throttle content as they see fit. With this example, we see an innate risk in federal governmental entities. They may change leadership and ideals over time, creating inconsistency in the regulations and enforcement.

Today, the United States has the FTC (Federal Trade Commission) in place. It is a part of the federal government, and it runs as an independent agency. Their goal is to allow for ads to be fair and honest for consumers and other business owners. Their guidelines can help be a starting model for questions to ask regarding the implementation of advertising within the hyperreality. To take the consumer perspective, for example, the FTC promotes truthful, fair, and evidence-backed advertising¹⁶. What would the questions be concerning hyperreality? The FTC has a set of values as their guidelines and their means of approaching companies, so

let's approach potential issues of XR with a similar lens. The FTC is also a good example of how an independent agency can assist the government. The regulation of tech may take time and comes with many lessons learned, and it will be important to start with principals and to go from there.

REGULATE ACCORDING TO LOCAL JURISDICTION

There are already cities that have dealt with the frustration of tech's impact on reality. For example, in Milwaukee County, there was an issue with the AR gaming app of Pokemon GO bringing large groups of people to a local park. Hundreds of people crowded to the park to try catching Pokemon in augmented reality. The gamers left the park messy and caused disruption to the normal activities. The city already had a law in place requiring a permit to be issued for any planned gatherings of more than xx people as a means to avoid this type of disruption. The city responded by requiring future gaming developers to acquire permits for such gatherings. The game developers then sued the county declaring the ruling unconstitutional as a park is a grounds of free speech¹⁵. When technology has capabilities of allowing intentional gatherings the consequences of any large event are a reality and the need for a permit become important as there is still a certain upkeep communities need to maintain.

REGULATE AS SPACE

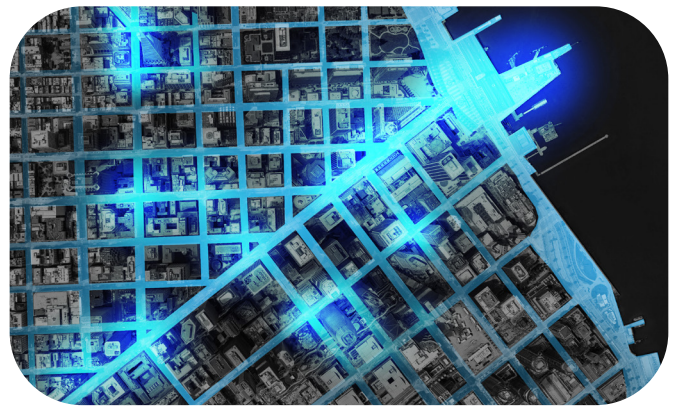
As virtual space becomes indistinguishable from physical space, it needs to face the same scrutiny as physical space. There are well-established precedents in place for how to regulate our space, and we can use these precedents to find parallels in virtual space.

For the land of our cities, we have zoning regulations. There are designated uses for designated areas of land. Local governments are responsible for maintaining the zoning regulations and keeping an up-to-date vision for how the land in their jursidiction is to be developed. If a developer wants to contest the approved use for a plot of land, there is a system in place for them to make a request and have it be reviewed by the local jurisdiction. It helps to treat the potential hyperreality the same way. Cities can designate

which types of augmentation are allowed in which specific areas of their jurisdiction. A city may decide to create an augmented "Times Square" by allowing maximum XR overlay in a specific square, while restricting the augmentation in the surrounding areas to information/text only.

Another layer of regulation is the ownership of each individual plot of land. One way to approach Hyperreality would be to extend property ownership into the XR environment as well. If one owns a plot of land, they also own the XR environment corresponding to that plot of land. If this does not happen, it would allow one person to design an unfavorable XR overlay for their neighbor's property.

Beyond ownership and zoning, there are other jurisdictions that have oversight on the development of our physical space. Many cities have governmental Boards, sometimes called Design Review Boards, that oversee the design of new projects within their jurisdiction. With hyperreality, there may also be specific boards created to have oversight over different aspects of the hyperreality. A Design Review Board may need to approve specific types of content to ensure consistant quality of place and prevent property degradation through bad design.



↑
XR Zoning: using our physical precedent to regulate digital space.

Map Data: Google, Image Landsat / Copernicus

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