NEW STUDENT TYPOLOGY: STUDENTBOTS?
ARCHITECTURE STUDENTS FACING DISRUPTIVE
TECHNOLOGIES IN THE PANDEMIC ERA

ABSTRACT

The coronavirus pandemic and the obligation to be confined to small spaces for the majority of the population left us questioning how to teach the new design rules and communicate spaces without our physical presence. The 21st century student was already heading towards having a “bionic personality” due to new technologies. Simultaneously the classic project design outputs like paper presentations were gaining a high level of abstraction due to the massive data overlap and were demanding new formats for better public interaction. In such a context as confined designers and educators, we have seen a clear opportunity to boost all new digital formats, allowing design decision-making, new interaction platforms, and disruptive visual technologies such as virtual reality (VR) and augmented reality (AR). By applying new teaching tools using VR/AR in different contexts and projects the concept of ‘studentbot’ will be narrowed down. Through different teaching experiences and project examples, we will evaluate the successes, failures, fields of expansion, and controversies of this new student typology.

Manuel Collado Arpia
Escuela De Arquitetura
Universidad De Alcalá De Henares (UAH)
manu@manholo.com

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INTRODUCTION

The pandemic and the obligation to be confined to small spaces for the majority of the population left us questioning how to teach new design rules and communicate spaces without our physical presence. Simultaneously the classic project design outputs like paper presentations were gaining a high level of abstraction due to the massive data overlap and were demanding new formats for better public interaction. In such a context as confined designers and educators, we have seen a clear opportunity to boost all new digital formats, allowing design decision-making, new interaction platforms, and disruptive visual technologies. In this sense, the pandemic seemed to turn us into a certain type of ‘astronaut designer’ contemplating the universe from our imposed space cabins. In this case, the idea of the creative journey from the cockpit was offered as a possibility to experiment with the new tools of the digital age. Buckminster Fuller’s slogan ‘We are all astronauts, always we have been,’ seems to have come true.¹

As observers of a journey without movement, we seemed to return to countercultural utopias, where the new technologies of the 1960s offered the possibility of reproducing the depths of the psychedelic transformative journey. The houses, workplaces, and vehicles of the counterculture were equipped with all the available technologies to offer a new description of reality. From a material point of view, this condition could be symmetrical to the one that the pandemic has forced upon designers and students. We have surrounded ourselves with the digital to attend to another new reality, although the starting conditions have differed.

On the other hand, both architects and students were already gaining a ‘bionic personality’ due to the new available technologies like VR, AR, or digital fabrication. The observation of territory, the analysis, and the management of this data in the presentations for architectural proposals were changing rapidly within this context.

This was the context for the teaching work at the Architectural Association, which has born in a very specific practical and theoretical framework. Although there was already research on virtual reality since the 1990s,² the cost of the technology did not allow it to be applied to normal teaching scenarios in an architecture design studio. Only in the 2000s, a few artistic experiences like Char Davis³ used an immersive virtual reality to simulate spaces with digital natures, summarised in her book ‘Immersive Virtual Art and the Essence of Spatiality’, thanks to heavy and expensive virtual headsets. In 2011, the first edition of
'Ready Player One' was released, a narration about virtual worlds created by a video game. Thanks to wearable technologies the book described how entering and exiting the virtual narrative, giving us innumerable clues about the near future of first-person navigation through immersive virtual spaces. But it will not be until 2014 where the first possibilities of accessing light and economically viable virtual technology at a global scale arise. This was possible thanks to the Oculus Rift DK2 headset, a version for developers that did not exceed 400 euros. Simultaneously, Samsung mobiles together with cardboard glasses launched by Google allowed more simple immersive virtual experiences. This scenario surely permitted launching one of the first architecture design studios based on VR tools.

Distance learning, presence, disruptive forms of visualisation for territory analysis, communities formed around alternative uses of technology, and virtual user experiences in space were the basis of several observations of the teaching experience at the Architectural Association in the years prior to the pandemic. The same observations have also served as a testing laboratory to assess the creative possibilities of the technological conditions that the pandemic has forced upon us. It has been a way to detect the successes and failures of the students when faced with their new ‘bionic personality’. Some of the examples mentioned in this paper describe the starting conditions that were generated during the Architectural Association’s courses, allowing us to understand the use of new technologies and the methodology used. The characteristics of what we call a bionic student or studentbot will be defined through different arguments, we will be able to understand the successes and possible failures and how these qualities have been integrated during the pandemic.

TECHNOLOGIES OF OBSERVATION

The first example is the course conducted in Río Tinto (Huelva, Andalucía), as the unit was transformed into a certain type of Virtual Tour Operator. As tour operators, students were researching Río Tinto’s geographical, social and environmental conditions as well as new trends in tourism, virtual reality, and forms of inhabiting the toxic, including science, art, sci-fi, etc., in order to construct a critical response to both the brief and the site, and to propose a topic and location for their design of a space station for tourists or “Touristic Station”. They prepared the virtual description of where, what, and how the settlement could be and what its relationship would be with the toxic that comes from mining activity.
Simultaneously they produced a set of large 360-degree colourful collages with the first spatial proposals of VR landscapes. Our site, the vast open mines of Río Tinto in Andalusia, is one of the world’s most radical examples of toxic landscapes, and a perfect ground for testing new forms of tourism. The mines coexist with delicate ecosystems like Doñana National Park and traditional rituals involving colourful religious pilgrimages like romerías. Both contexts, being deeply involved in tourism networks, offered the unit a unique backdrop for observation and research.

In Río Tinto, the students explored new ways of perceiving, inhabiting, and enjoying these synthetic ecosystems. The unit addressed the role of tourism within a polluted environment, and how VR can play a fundamental part in reimagining ways of inhabiting the toxic. ‘To observe is not to look, but to look, listen and take notes; isolate, build a laboratory with the view,’ wrote the architect Iñaki Ábalos. There are several interesting pieces in architectural history that talk about this condition of observing. The Outlook Tower by Patrick Geddes in the late 19th century is a pure construction elevator around this concept. The tower provides two journeys: the ascending one to connect with the outside world (a panoramic view of Edinburgh) and the descending one, internally, to connect with its broad cultural context (Edinburgh, Scotland, language, Europe, and the world). The observatory connects perception with knowledge, connecting what is out there with our thoughts.

What would the 21st century version of these ancient observatories be like? What kind of new windows will appear on the scene with new digital tools? What new platforms will blend the memory of the physical environment with the associated informational data?

The unit investigated proposals that beside the creation of immersive lobbies for the tourist stations or alternative observatories stemming from iconic references were also inspired by the countercultural techno-settlements and other radical architectures. As a case study of previous precedents of observation, we focused on the House of the Century from Ant Farm.

The House of the Century is a housing proposal located by a Jurassic Lake. It is in a somewhat hostile environment, which was deliberately chosen as it seems to simulate an eventual exploration mission to analyse native species, such as crocodiles, armadillos, snakes or frogs. The House of the Century is perceived to have: ‘Landed like a strange large lunar module that appears to have been accidentally lost from its nearby NASA base.’
It would perfectly embody that new ‘role of housing as a base camp for incursions into the scene of sensations’ defined by Sloterdijk, within the housing conditions defined for post-agrarian society. An expectant ‘lunar home’ before the cascade of expanded sensations that are inherent to the new natural settings chosen by the New Age ideology, in this case, a fluid, viscous and unstable reality.

It was necessary for the unit to offer a detailed description of this house since it constitutes the first clear and ‘sedentary’ constructed symptom of the nomadic and psychedelic spatial programme. The House of the Century was a concrete snapshot of the electric and mobile guerrilla adventures that we had been enunciating until now. Trying to balance its hard-shell appearance with a streamlined image, both on the outside and inside, this machine seeks to ‘represent itself in motion’. The house incorporates all the micro-technologies available at that time: antennas, beacons, adjustable spotlights, sirens, alarm lights, speakers, television, and video systems. We must insist that these micro-technologies have never been considered as a military defence system facing a hostile environment, but rather as a reconnection mechanism with an unknown environment, trying to merge as another living being by that lake and in that extraterrestrial ecosystem (Figure 1).

Continuing with the portrait of this psychedelic machine to the classic domestic programme of the house created by Chip Lord and Doug Michels, other unusual devices are added such as: ‘… a mobile nutrient servoid, a mobile refrigerator, and a control panel for the mobile media-servoid …’,8 the control panel is a device to operate five televisions in the house that includes FM/AM radio and a tape recording system. The interest of these additions lies in the fact that we are in front of a real control booth inside a home, also with mobile technology. It was the first time that a house had sought the possibility of monitoring and registering its surroundings quite exhaustively. In addition, Ant Farm included the possibility of combining the recording of its users’ lives with the landscape using ‘storage and playback equipment for the family media history,’9 the control cabin would allow us to first store, equalize and sample our memories together with the environment.

The first statement to experience our condition as new technological observers instated by Ant Farm was on the island of Lanzarote. The approach was to photograph the island with 360 cameras giving rise to 360 interactive photographs/collages that could be viewed on Google Cardboard. This can be seen in the collage of the Lanzarote environment proposed by Chak Hin Leung, where in addition to the immersive journey, the floor textures of the chosen landscape were indicated through small windows-tiles (Figure 2).
UP: Fig. 1. The House of the Century, Ant Farm.

CENTRE: Fig. 2. 360-degree Collage Lanzarote Volcano journey, Chak Hin Leung, Intermediate Unit 11. AA.

DOWN: Fig. 3. TVR visualisation of sulphur toxicity, Olivier Jauniaux, Intermediate Unit 11. AA.
In Río Tinto our touristic stations will also operate in the same way as the House of the Century. From a privileged position, strategically located in this particular enclave surrounded by the mines, our stations will observe the toxic landscape, creating new forms of perceiving and inhabiting the mines, going from their radical 3D atmosphere to their virtual immersive version. For instance, Olivier Jauniaux created a sulphur toxicity visualisation through VR to zoom in the microscopic scale, magnifying the perception of the toxic waters of the river (Figure 3).

Our next unit trip was to Portman Bay and observation was tested again, including the toxic and the polluted. The unit once more redefined a new tribe of travellers or explorers. The techno-students’ typology set out a group of physical and technological devices for observation. This time the camp operated as a station in the Mars-like environment, as a portable structure equipped with perceptual instruments to experience the outer world from mobile systems to record-like drones, rovers, or submarines, to optical gadgets and filters incorporated in the architectural components. We again used Ant Farm as a reference point, but with their Truckstop Network as a case study, which defined a whole network of ‘media eyes’ to record the new visions of western America. With such a background, the techno-tourist student, as an astronaut, navigated through heavens, volcanic landscapes, and acidic rivers, adding an augmented perception via virtual technologies. We understood architecture as an opportunity to redefine the typologies of traditional camping associated with unique touristic enclaves, adding qualities and enriching the displaced virtual experience.

The field trip was the moment at which the students confronted the physical experiences in Portman Bay and Murcia. The students documented their site and their immersion again by 360-degree images, videos, and a fieldtrip handbook with sketches of the development of the proposal. They researched Portman Bay’s geographical, social and environmental conditions as well as new trends in tourism, immersive technologies like VR and forms of inhabiting the toxic environment.

However, our understanding of the toxic through disruptive technologies was not restricted to visualising landscapes with chemical concentrations, but it also took the complex assemblages of bodies, politics, institutions, infrastructures, and everyday practices that constitute toxic environments into consideration and engaged with them. Through the unit projects, we explored forms of inhabitation through restoration, overlap, protection, copying, or remediation, at the same time redefining what tourism, the toxic and their interrelation could become in the future.
The results by means of the new technologies of observation and digital analysis allowed new forms of simulated presence in the toxic landscapes, the visualizations in 360 degrees improved the communication of the projects from a distance, for example through 360 apps.

VIRTUAL REALITY AND AUGMENTED REALITY

The students used Bill Gates’ house as a case study of a station for digital observation and VR/AR in the 21st century. This house can be seen as an updated technological version of the House of the Century from Ant Farm. Situated in the lakes of Washington state, it is simultaneously a kind of expensive first prototype of what our spaces of creation and work have been during the pandemic, some sort of space cabins to work like astronauts.

Although his villa is presented to us at first as the maximum representation of the success of the technocratic system of the American middle bourgeoisie, it is confirmed that there are New Age traces in its conception that would connect us in part with the characters that were in Tarzan in The Media Forest and The Digital Gardener. Patterns are apparently hidden behind the ‘great luxury’ packaging that corresponds to this type of housing programme.

The home wants to hide and spread out among the mighty wooded wilderness of nearby Seattle. Also, its image of grouping wooden ‘huts’ in the style (Pacific lodge) of the first settlers of the northern Pacific border seems to seek an idea of disappearance and natural fusion with the environment, without subduing or dominating it. It even vaguely recalls the primitivism of some tribal settlements of their countercultural predecessors. This condition allows us to partially return to the idea that Sloterdijk enunciated, referring to housing as ‘a base camp for incursions into the scene of sensations.’ But in this case, the base camp does not only refer to its close environment, but it is also not a priority, nor does it have that extra-terrestrial image offered by the lake context of The House of the Century by Ant Farm, because the same spatial and exploratory metaphor of the near environment is no longer being pursued.

Indeed, the exploratory field is shattered, and it merges from its natural enclave with the flow of information that runs through the world. Bill Gates’ housing programme once again has all the technological systems to access the environment; the space that you want to conquer, or that has been partially conquered, is in this case cyberspace.
His house confirms that today we spend more time navigating digital spaces than experiencing the real ones. One field after another from music to finance to culture has found its equivalent in the digital world. The libraries that we visit most frequently are not buildings filled with print publications; they are our personal online libraries with an almost infinite capacity for books. Architectural information and spatial typologies have their digital translation but are missing their virtual opportunity. The unit explored this opportunity and was the first at the Architectural Association to introduce VR into the academic curriculum.

VR has the potential to provide spatiality to digital daily experience. When we started using it in 2016, it was expected to be the year of this technology and was described by multiple media as the definitive platform which was going to transform our domestic habits. Big Tech companies such as Facebook, Samsung, Sony, and HTC are heavily investing in this area.

The experience was like if you were placed in the centre of a completely new spatial situation while putting a pair of goggles on. You can look all around, move along the space, interact with your environment that phenomenological sensation of being immersed is defined by VR/AR pioneers in existential terms as ‘presence’. We decided to explore this new type of presence with the students’ design outputs integrating VR/AR with the unit briefs and have been doing so since 2015-16.

The approach was to work with immersive tours to integrate the virtual experience with the new tourist conception of the unit. We were working to offer new programmes for tourist destinations in the Anthropocene context. The studentbot added this tourist perspective to their digital agenda through VR and AR. This was the case of the proposal of an Augmented Reality Landscape editor from Yee Thong Chai, where she designed a real-time interactive device to edit the landscape through body movements using a form of mandala trackers to guide the user in the editing process (Figure 4). Another tool allowing immersive experiences was the virtual customer journey of Elisabeth Hardie. This virtual tour was documented in 2D by a story board of edited images (Figure 5).

This type of tourism with a virtual goal required new forms of visual editing, so during the year the unit became a laboratory of visual exploration, using innovative image protocols to translate the specificities of our site into a broader tourist experience to be shared globally. The third term was dedicated to finalising these formats, understanding the portfolio as a new opportunity to integrate the 3D immersive world with the 2D classic formats. Accompanying the VR devices we simultaneously launched a video version or browsable interface to operate with the final architectural proposals, which could communicate the
UP: Fig. 4. Augmented Reality visualisation of an interactive landscape editor, Yee Thong Chai, Intermediate Unit 11.AA.

CENTER: Fig. 5. Virtual Reality visualisation of an interactive tour, Elisabeth Hardie, Intermediate Unit 11.AA.

DOWN: Fig. 6. Real/Virtual diagram/section of a customer Journey through the building, Jasen Kok, Intermediate Unit 11.AA.
results to a broader audience. As an example of visual exploration we launched the production of diagrams like the one designed by Jasen Kok, where different formats are combined into a single synthetic diagram, the section overlaps with a VR story board and a diagrammatic customer experience journey through the building (Figure 6).

The tension between VR/AR and physical environments was explored, understanding what one can do in relation to the other. How do they expand, complement, put into question, unfold, or intensify each other’s capacities? How does VR also enhance the presentation of final results? The students worked in parallel with developing the physical definition of the new tourist camps and the virtual experience.

**STUDENTBOTS AND LIGHT TECHNOLOGY**

To apply all the virtual and immersive narratives, it was necessary to explore all devices through body interactions. That is why the design studio sought to use technology with the tribal culture in the Cape Town enclave. The projects spun around this idea of techno-tribalism where bionic culture, in this case, was channelled from the use of light technologies like wearables to nomadic colonisation systems based on electronic music festival culture. The unit travelled to Cape Town as we considered South Africa to be one of the most appropriate landscapes where this countercultural tech-activism can flourish, but where its tribal roots have long been erased. It is a country where wilderness and urban growth are facing precarious sustainability, where new technologies are implanted faster than physical infrastructure, but it is also a continent with a strong tribal identity that is necessary to inspire visionary settlements that fuse past, present, and future.

Club culture and holistic practices have already served as unusual architectural tools to create alternative environments dedicated to the empowerment of the self. This year, the unit looked at wearable technologies as a growing field to provide students with a whole new set of superpowers. We began by designing jewellery with cosmic sensory effects. These devices amplified the perception and interaction with space and provided their users with a radical communal identity. Like the temporary structures that populate the Nevada desert during the Burning Man Festival, we looked to the sub-Saharan equivalent, Afrika Burn, where tribal pasts and scientific futures are manifested through lightweight constructions. Critiquing the western import of vernacular architecture, we were inspired by the decorative pieces and unique traditions of this context.
to create modern equivalents. To design these buildings, the students learned from the most technologically advanced products of contemporary culture: the spaceships of science fiction, magnificent examples of highly operative inhabited environments fully loaded to set up alternative colonies. The spaceships were camps for craft and innovation, spaces to work and exhibit these new traditional-digital hybrids. Together the unit was expanding the body/mind relationship to technology in this wild natural landscape. Part of the success of the proposal was working with the body and wearables in relation to the context. Thanks to this condition and its small scale, the students made a great deal of progress in making project decisions, without the need to be physically in Cape Town. For instance, in the case of Jakob Skote (Figure 7) with his necklace using tribal patterns and Wi-Fi technology, through this device he scaled up the strategy for an urban proposal using tribal pattern fractality.

On building the concept of a studentbot or bionic student, both while teaching in the pandemic and in the courses of the Architectural Association, The Whole Earth Catalogue by Stewart Brand was used as key reference, a perfect example of revolutionary hybridisation of digital technology in relation to nature. The students have been introduced to the New Age technological culture proposed by the S. Brand catalogue and then they have been contextualised in the architectural design culture of the 21st century. In this sense, we have looked at two texts that represent, from our architectural perspective, two relatively analogous ways of redescribing the new students that emerged from the development of the Whole Earth Catalogue statements.

We are referring to that subject that advanced to a form of relationship of a bastard nature, that is, halfway between the tribal survival kit and the latest electrical techniques. The two figures emerging from these texts are Tarzan in the Media Forest by Toyo Ito and the Digital Gardener by Cristina Díaz and Efrén García Grinda. Both characters emerge from an understanding of an expanded nature that is already implicit in their semantic play, as was the case with the Electronic Oasis of Ant Farm. It is precisely this extension that interests us since it is actually the evolution of those simulations of an acidic experience of nature. If we were to make both characters have a conversation, the coincidences would be clear. In both cases the sphere of the natural expands and communicates thanks to the digital, that is, thanks to the scale of the infinitesimal or the data bits that now replace the lysergic acid molecules:
The inside of a computer naturally is not the inside of me, it is an ambiguous world in which the borders are vague, and I cannot say how far you extend yourself. Time and space within electronic media are notions that are different from those of our daily lives. As we enter this world, a strangely comfortable feeling arises within me.\(^{12}\)

The Digital Gardener:

Digital Gardeners, the species breeders of zeros and ones, define their species and work on them through interfaces, in written command line sequences. It works by operating on encoded information packages through a technical language of mediation between the subject and the object.\(^{13}\)

We will also use this dialogue to obtain some of our own characteristics and thus display all the possible ways of understanding the options for coexistence with these natures. Ito’s Tarzan offers us again a smooth and hedonistic look at his relationship with digital nature. We would be closer to a countercultural DNA of
smooth fusion with the environment, in the sense of rocking and navigating the fluid ambiguous territory that both natures create, without bad or good, without any gesture of natural-artificial duality, without a worrying need to create, for example, electronic hypertrophy of large artificial species that break homeostasis with a real nature.

Tarzan in the Media Forest:

And we contemporaries are provided with two types of body to correspond to these two types of nature. The real body that is connected to the world through the fluids that flow through it and the virtual body that is connected to the world through the flow of electrons.¹⁴

Next, Toyo Ito introduces an oriental concept of ‘Ki’ (spirit, energy or breath that runs through the cosmos), and expands on the previous quote in more detail:

At this extreme, electronic technology begins to emerge and reminds us of the world that we had almost forgotten. The flow of electrons is superimposed on ki and water.¹⁵

However, the Digital Gardener would pick up that other dimension that recovers the extremely artificial, closer to the climate generated by multimedia happenings. This gardener would be closer to the figure of DJ at a rave party, to the manufacturer of intense artificial atmospheres, to that figure that practices fusion with the environment through bombardment with cathode rays to pulverize the subject in the ether. This dimension would be closer to that evolution from the counterculture towards cyberpunk, that is, a strongly redirected technique to alter a complacent landscape, even if this technology remained hidden, it would be part of a large artificial organism.

The Digital Gardener:

It would then be possible to work with the intensity of the stimuli, with altered states and different levels of perception. All this at different scales, from microscopic to landscape. (…) We could ask ourselves what would happen if we implanted laws of succession and natural growth into our artificial landscapes in a massive way, as well as geometries and generative laws of artificial contours.¹⁶
Tarzan in the Media Forest and The Digital Gardener today configure two alternative ways of operating with nature and space from a rereading of the counterculture. Both forms walk on the edge of an architectural reality, and launch messages in the key of technological utopia, ‘studentbots’ are working now under symmetrical protocols, waiting to design and build alternative realities.

STUDENTBOTS OR HOW THE USE OF DISRUPTIVE TECHNOLOGIES NEEDS A STRONG REALITY

The construction of the idea of the ‘studentbot’ is very contradictory. In the years before the pandemic, we explored the use of multiple tools that seemed to be able to simulate realities and proposals through heavy digitisation. As we have seen, AR and VR have opened a new variety of graphic means, including ways of improving the traditional architectural outputs by adding new layers of complexity.

However, during the recent pandemic teaching, with the possibility of using the same devices that allowed us to understand the statements proposed a year earlier, the results lacked the expected complexity. Students have not been able to go further than the classic 2D graphic rules. It seems that paper, has simply been replaced by the flat screen, while maintaining the same perceptual functions. Why have the students in the design studios been unable to incorporate the technologies that were already at their disposal? For example, we have seen that there are already good tools for exploration and digital immersion without the need for our physical presence. Starting from the body and with portable light technologies, we can obtain records of complex realities and transmit them over long distances. But we have been able to verify that it is also necessary for the ‘bionic student’ to be proactive and use technologies in a purposeful and disruptive way. This condition undoubtedly requires involvement with essential physical energies both in incursions into the contexts of the briefs and sharing the analysis and results with others. That is, technologies, even if they are digital, improve if they are shared in physical spaces, adding a layer that broadens the reality that we perceive, but that never replaces it. Forced by confinement, the substitution of reality has not aroused the curiosity and the use of disruptive digital tools from the student’s side.

The examples we have seen from the counterculture demonstrate that it was the period in which the alternative use of technologies, networking or connectivity
were more creative and purposeful, offering a better and healthier version of our relationship with the planet. Catalogues such as Stewart Brand’s Whole Earth are an example of the balance between highly technological proposals and the connection with nature or reality. The New Age needed intense personal experiences or ‘bites’ of new realities to understand the creative power of highly technological tools. This condition and the hijacking of reality to which the pandemic has forced upon us indicate that it is very likely that the best version of the ‘studentbot’ will not return until we can recover the full experience of nature. In this sense we subscribe to Ito’s phrase in relation to the android body:

‘It is about generating a space like fluid, in which movements back and forth between fiction and reality occur incessantly.’17 In the examples that we have been able to explore through the works of the Architectural Association, we believe that the digitisation of the student has a possible future. Immersive territory exploration systems and new AR/VR display formats have resulted in a collection of highly communicative visual documents.
NOTES

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STUDENTI BOTOVI? STUDENTI ARHITEKTURE SUOČAVAJU SE SA DISRUPTIVNIM TEHNOLOGIJAMA U ERI PANDEMIJE

Manuel Collado Arpia

Kontekst pandemije i obaveza da budemo zatvoreni u malim prostorima za većinu stanovništva doveli su nas do pitanja kako da predajemo o novim pravilima projektovanja i komuniciranja prostora bez fizičkog prisustva. Student 21. veka već je krenuo ka bioničkoj ličnosti zahvaljujući novim dostupnim tehnologijama. Istovremeno, rezultati klasičnog projekta, poput papirnih prezentacija, sticale su visok nivo apstrakcije zbog velikog preklapanja podataka i zahtevali su nove formate za bolju interakciju sa javnošću. U takvom kontekstu ograničenih projektanata i edukatora, videli smo jasno priliku da unapredimo sve nove digitalne formate koji omogućavaju odlučivanje o projektu, nove platforme interakcije i disruptivne vizuelne tehnologije kao što su VR i AR. Primonom novih nastavnih alata koristeći VR/AR u različitim kontekstima i projektima koncept „studenta bota“ će biti sužen. Kroz različita nastavna iskustva i primere projekata, procenićemo uspehe, neuspehe, polja ekspanzije i kontroverze ove nove tipologije učenika.

KLIJUČNE REČI: STUDENT BOT, DIGITALNA ARHITEKTURA, VIZUELNE TEHNOLOGIJE, DISRUPTIVNO, PROŠIRENA STVARNOST, VIRTUALNA STVARNOST, TEHNOLOGIJE POSMATRANJA, ARHITEKTONSKO OBRAZOVANJE, PANDEMIJA