The Classical Tradition of Artificial Intelligence

Andri Gerber in Conversation with Mario Carpo, February 11, 2025 (online)

Andri Gerber: AI has been a hot topic in architecture for some time. What concerns us all, is to what extent it is transforming or might transform our profession.

Mario Carpo: In order to discuss this, we have to start by acknowledging that, in the context of architecture, there is not much you can do with the available AI tools at the present. There are offices training their models on past work, so that they can replicate their style. Coop Himmelb(l)au is one example. They published an article about their AI model, which can reproduce the office's house style. They call it "Deep Himmelblau."[1] But in this case it is rather easy, because the office has a distinctive style. But many offices don't have a specific style, so they can't do this kind of exercise. Even for Coop Himmelb(l)au this is mainly a marketing tool and, I understand, they use it primarily as a first step when discussing initial ideas with clients. If the client is convinced, then the real work starts.

AI has already replaced quite a number of jobs. Think of all those working on images. Generative AI can do better image editing than humans. But it's not a design tool. My argument would be that generative AI is not changing the way we work, but rather the way we look at architecture. We are talking about a cultural and conceptual impact, and this leads us to look at architecture in ways which are not new, but revived and brought back to us. We have to go back and consider how architecture was seen in the European classical tradition since Antiquity. This way of thinking was cancelled by twentieth-century modernism for many reasons. Indeed, I was a modernist myself, at least in

1 Wolf Prix, Karolin Schmidbaur, Daniel Bolojan and Efilena Baseta, "The legacy sketch machine: From artificial to architectural intelligence," *Architectural Design* 92, no. 3 (2022): 14–21.

spirit, so I know something about it. If you believe that form follows function, any idea of creative and stylistic imitation becomes obsolete.

AG: Do you yourself use any AI tools in your teaching?

MC: Many students use a category of software called "Style Transfer." The idea is that there is something from which you can draw inspiration. Even though design students often don't know art history, they are nonetheless constantly talking about "style." So the idea of style comes—literally—from the program they are using. But the term was very important in art history. Think, for example, of German architectural theory in nineteenth century, about Heinrich Hübsch and his book, *In What Style Should We Build?*, from 1828.[2] Or think about Vasari and his idea that some paintings have something in common, what he calls *maniera*.[3] One could even go as far back as Cicero to find a reference to the concept of style.

In the classical tradition, imitation meant inspiration, transposition, and transformation. Imitation was part of creation. There is no creation without some component of imitation, and there should be no imitation without some component of creation. That's the classical tradition. With German art theory in the nineteenth century, in particular, style became an inevitable term in architecture.

We thus have two terms—imitation and style—which are embedded in the classical tradition. They rose then fell together under the guillotine of modernism. We should not forget that the first modernists were still trained in the academies and in this tradition, which they then rejected, but, regardless, they wanted to create a new style. When modernism went to America it became "the international style," named after Philip Johnson's MoMA exhibition.[4] Tradition, style, and imitation became forbidden words only with later modernism.

For these architects, imitation meant copy, and hence plagiarism, and hence a crime, something to be reprimanded and repressed. They even came up with a totally new vocabulary to avoid these words.

When I was a student, you could not mention the word "imitation" without being considered an idiot. At the same time, we were all looking at references for our projects. [laughs]

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2 Heinrich Hübsch, *In welchem Style sollen* wir bauen? (Müller, 1828).

3 Giorgio Vasari, *Le vite de' più eccellenti pittori, scultori, e architettori* (Giunti, 1568).

4 Philip Johnson and Henry Russell Hitchcock, *The International Style* (Norton, 1932).

So, we did imitate, but we were forbidden to conceptualize imitation. You could do it, but you shouldn't talk about it.

AG: Absolutely, that was the same for my generation during our studies!

MC: Imitation and precedent returned with postmodernism, but the situation remained complicated, and the terms "imitation" and "style" were never really rehabilitated. Think about one of the bestsellers of the 1970s: Harold Bloom's *The Anxiety of Influence*, published in 1973.[5] Interestingly, you have here a book which is all about tradition and imitation, but these two terms are never mentioned!

In my understanding, thinking in terms of style and imitation is an inevitable component of the human mind. You may repress it as modernists did, but now it is coming back with generative AI, which is rather ironic.

AG: Imitation forces us to talk about copyright.

MC: Well, in the classical tradition, the notion of copyright could not exist, because it was a right, even a necessity, to be inspired by precedent. With mechanical reproduction—for example, the copy of a photograph—copying became an identical reproduction. Hence the idea of plagiarism. There is a right of copy, but there is no right of inspiration.

There are no royalties to be paid for influence, for the intellectual property of influence. You go to a museum, see a painting, and that might inspire you. With modernism, to copy became to cite. The idea that you need quotation marks. Collage is a typical modernist technique where you take fragments and put them together.

The classical tradition was different; there you look at something, you absorb it, you digest it, you transpose it, and then you create something new. You are inspired by something, and make something out of it, but you won't be able to reveal the ingredients you were using. Gottfried Semper, following Bötticher, would define this process as *Stoffwechsel*,[6] which we can translate as "metabolism." We can explain it by a metaphor: it's about the difference between French *potage de legumes* and Italian minestrone. In the first soup, you

5 Harald Bloom, *The Anxiety of Influence: A theory of poetry* (Oxford University Press, 1973).

6 Gottfried Semper, *Der Stil in den technischen und tektonischen Künsten* (Frankfurt 1860/3).

can't identify the ingredients, except from the color; in the second you can recognize all the vegetables. The French soup is the classical tradition; minestrone the modernist.

There is a nice story about the Greek painter Zeuxis. He was invited to the south of Italy and asked to make a painting of Juno. He asked for the most beautiful girl in the region, in order to use her as model, but could not find anyone quite to his taste. Instead, he chose five models, not one, and composed a painting out of the most beautiful features of all five.

And this is exactly what AI is doing. It's merging, transforming, transmogrifying. But the data set today is not made of five models but a gazillion. And with generative AI, anybody can do that! And this is what we used to do in the past, with the exception of the last seventy to eighty years of modernist dogma.

AG: The story of Zeuxis resonates with how Alberti developed his own proportional system. Rejecting Vitruvius' assumption of a fixed system, in which the head is always 1/7 of the body, and knowing that this system does not apply to many people, he made a new system out of the proportions of several individuals.[7]

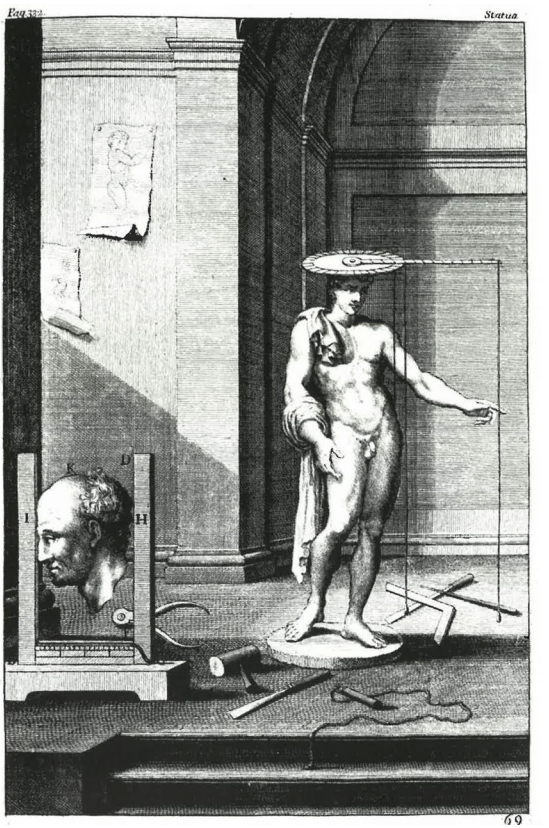
MC: And that is where his machine to transpose proportions he describes in *De Statua* comes from.[8]

AG: Let's go back to teaching. Before you said that the first modernist architects were taught in the classical tradition and rejected it. Their students then grew up with the new tradition, but without any knowledge of what their masters rejected, and this led to a great ignorance and finally also to the dogma you described. My question then would be, how do we teach our students for them to really understand what these tools mean in the context of our rich history?

7 Andri Gerber, Tibor Joanelly, and Oya Atalay Franck, *Proportions and Cognition in Architecture and Urban Design* (Reimer, 2019).

8 Leon Battista Alberti, *Della Pittura* (1435).

Fig. 12: Leon Battista Alberti, Finitorium, 1435



MC: As I said before, our students use these programs, which were invented around ten years ago, but they don't know what the notion of "style" implies. But what is even more problematic is that we are missing a culture of creative imitation. We are not capable of dealing with imitation in critical and creative terms, because we are not teaching imitation anymore.

And this is not the consequence of a new technology. It is a consequence of modernism, which decided that all forms of imitation were a crime. Imitation was eliminated from our discourse for a very long time. We were trained to imitate without having a concept or a theory for it. We lacked the terms to de-

scribe it; we did it in an idiotic way in the technical sense of the term, without having a language to describe what we were doing.

We have lost the classical tradition, which was based on imitation. Don't forget that tradition means transmission. For centuries we had a huge body of consensual thinking to theorize what imitation is and to make a distinction between bad imitation and good imitation.

We have to ask again: what is the pedagogy of imitation? Think about learning languages. You learn them at school through rules, declensions, etc. But before school, we speak the languages without any rules, without any grammar, by simply imitating the sounds coming from the mouths of the people living next to us.

Imitation as a practice without a theory is embedded in the technical history of computer science. From its beginnings in 1956, AI had two styles, so to speak: the rule-based, or symbolic, and the connectionist, which was based on trial and error. Now you have large language models (LLM) and Chatbots. This led to large behavioral models which are used to train robots, so that they can repeat gestures. These kinds of experiments were first conducted by Google a couple of years ago. They positioned a robot to observe a person through computer vision. The person was sorting cubes of three colors—red, blue, and yellow—into a pile under the watchful eye of a computer with AI. This was next linked to a robot, which did the same by imitating what it saw. There is no scripted rule to explain what the robot should be doing. It is not scripted in the sense that the robot will lay a brick in position x, y, z because of some code. Rather, it is being trained and driven by AI. It looked at something and repeated what it had seen. It learned. This can be also explained by the notion of "tacit knowledge"; something that you learned and know, but cannot verbalize. You cannot explain it. The only way to teach an artist in that way is to have an apprentice learn next to the master. In the medieval craft tradition, for example, you would live in the same house as your master and just observe him working for twenty years until you knew what to do—by replicating what he did.

Machines today are automating tacit knowledge, which for a modernist, as I was by training, is somewhat perplexing, because I always thought that tacit knowledge is a shortcut we have invented to hide our incompetence [laughs]

The idea that AI is vindicating the stupidity which was always embedded in a non-rational way of doing things by imitation learning, or model teaching, which is the way we still tend to teach many arts and crafts, is fascinating.

That's what AI is now doing, which is fascinating, perplexing, and worrying at the same time.

So, to return to your question, what is the consequence for teaching? The question then is who is learning from whom.

AG: So, there is this historical background, but now concretely on this aspect of imitation, what is our role as teachers, and what is the role of the students?

MC: I don't have a direct answer. There is one thing we could do, but I hesitate to advocate it: restart teaching in the classical tradition. Not all of it, not what it did, but how it worked. Because there is a body of theory we now need. In order to have a dialogue with post-industrial machines, we should learn from the tradition of a pre-industrial age.

AG: That's a fantastic and quite radical idea!

MC: One problem is that although classical theory has recently been revived in architecture, the revival was not for good reasons. It is all about *looking* like the classics, not *thinking* like them. Advocating for the classical tradition today could be misunderstood, because of these references.

AG: Let's change subject for a moment. You have often used metaphors in this interview to explain your thoughts and I am also a big advocate of them, as they were the subject of my PhD. If we consider AI as a way to organize knowledge, it seems to do so without reference to architecture. In the past architecture was one of the preferred metaphors for knowledge systems. Think of the two-partite tower used to describe the relationship of the quadrivium to the trivium, the theater of memory by Giulio Camillo Delminio, or the music temple by Robert Fludd. Is the fact that architecture has lost its capacity to be a metaphorical vehicle for AI symptomatic?

MC: The art of memory goes as far back as Quintilian and Cicero, to name but two examples. It used the physical configuration of spaces to store and order memory. If Cicero had to deliver a speech in the Senate, where he would speak for hours, he first had to memorize it. To do so, he would subdivide his speech in units of arguments and place them in physical spaces, in order to pick them up at the right moment.

Now, AI doesn't work that way. Google has already replaced sorting, as you would do with a traditional library, where every book has its place, with coding and searching, where things have a code and not a physical position.

AG: The generic warehouse could then be the architectural metaphor of AI.

MC: You could say so. And if you look at the classical model of the library, the organization is based on several theories, such as the arborescent subdivision of topics, which was invented by Pierre de la Ramée (Petrus Ramus) in the sixteenth century or the Dewey Decimal Classification—named after Melvil Dewey—where every book has a place based on its subject. And when it comes to sorting images, we could refer to art historian Aby Warburg and his iconology and the arrangement of images in his *Mnemosyne Atlas*.

If you take a book and don't place it back in the right slot on shelf, it is lost forever. Nowadays the warehouses, which are organized by AI, don't have any sorting principle, because each item has a code which can be read by a robot moving from a distance. The logic behind this organization is that of minimizing the distance a robot has to run in order to pick a piece. Items which are most frequently sold are put next to each other, etc.

Ideally, the library of the future would make a huge pile of real books. Books would just be piled up without any order upon arrival. Each book would have a QR code or a code legible at a distance. When you looked for that book, you would put on a pair of Google glasses and say: "hey Google, where is that book?" And in the Google glasses, that book would become luminescent. So, you would go and pick it up. Automated searching has replaced human sorting.

We humans need to sort things. We put things in a certain place, so we know where they are when we need them. AI does not need sorting, because it can search without any order. Unfortunately, the profession of the librarian is one which will probably become obsolete because you won't need to put books on shelves anymore, assuming that books will continue to exist, which I think they will.

AG: We all hope so! But at the moment, we don't need sorting, we don't need a spatial order, and thus architecture as a way of organizing space.

MC: Searching is for computers. That's what they do. The question, then, is how this affects us and the way we think. This happened already before the rise of generative AI with the Google search, which has become a cultural technol-

ogy. This has definitively produced some kind of mental adaptation already. And speaking for myself, I remember fewer things, because I know I can find them anytime I need them. Thus, my memory is declining because the artificial memory I can use is now so effective.

AG: This makes me think of the famous study of taxi drivers in London who developed larger hippocampi due to their navigational skills, which demonstrates the plasticity of our brains.[9]

MC: Neuroscientists are no doubt currently studying the plasticity of a human brain adapting to these new ways of organizing knowledge.

AG: You have talked about the classical tradition. There is another tradition which is embedded in the etymology of certain word. Think about the word "artificial." If you look at its etymology, it goes back to Latin *artificialis*, which is derived from *artificium*, meaning realized skillfully or artfully. In German there is a nice mirror effect between *künstlich* (artificial) and *künstlerisch* (artful) which does not work in English. Something is artificial because it is artfully done. In architecture, the term *artificiale* was mainly used to describe visual effects and illusions. When we talk about AI, the connection to the origin of the word seems completely lost, as we don't think about something which has been done by humans but is somehow generated by algorithms.

MC: Well, "artificial" is not the only word to lose its original meaning in this context. Another word which has lost its original meaning in the context of AI is "generative." We do not talk about *creative* AI, but about *generative* AI. Here we have to go back to the history of Christianity. Generation and creation are important terms there. All this goes back to the Nicene Creed and one line in it, which says (in Italian): *generato non creato* (Latin *genitum, non factum*). Generated and not created. God creates, the son is generated; he is not made from nothing, he is made from something that is already there. Now think of what that means for generative AI. Nothing is created out of nothing. Everything is generated after something which is already out there. What do we call that in

9 Eleanor A. Maguire, David G. Gavian, Ingrid S. Johnsrude, and Christopher D. Frith, "Navigation-related structural change in the hippocampi of taxi drivers" *Proc. Natl. Acad. Sci. U.S.A.* 97, no. 8 (March 2000): 4398–4403, https://doi.org/10.1073/pnas.070039597.

architecture? Precedent, tradition, or history? There is no innovation without tradition. There is no license without rule. There is no invention without convention, and we always knew that. And now, AI is proving it.

AG: Absolutely. Again, we are back at tradition.

MC: Except that it's not intelligent: it can imitate, but it cannot creatively imitate. There is innovation, but based on tradition. Think of the famous metaphor of dwarfs standing on the shoulders of giants.

AG: I was rereading your introduction to the English edition of *Architecture in the age of printing* where you end the preface with the following words: "This book, which recounts how architecture came into the age of printing, implicitly suggests that architecture will also manage to get out of it—and survive. After all, we did well without printing for quite a while."[10] I was wondering what your outlook is nowadays, with all the experience that you have gained. Are we and architecture going to survive?

MC: That was thirty years ago! [laughs] Times have changed and we all have mixed feelings about technology. The problem in the first place is political. In 1996, 1997, a lot of architectural students were going into computers and the Internet, and wanted to be the next Bill Gates. But nowadays, I don't know anybody who wants to be the next Elon Musk … It is not a civilizational problem; it has become a political problem in the sense that we must ask who owns the technology. Don't blame the technology, blame the person who owns it.

AG: I think that is an excellent conclusion. Thank you very much for your time!

10 Mario Carpo, *Architecture in the Age of Printing: Orality, Writing, Typography, and Printed Images in the History of Architectural Theory*, trans. Sarah Benson (MIT Press, 2001), viii.