

# **SOME STRESS IS GOOD STRESS: ARCHITECTS REACT TO THE POSSIBILITIES OF AI**



**BY STORIES EDITOR**

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**Artificial Intelligence.** It feels like science fiction found its way out of a book and into our lives. From [uncanny valley](#) generated imagery to bad television scripts, Ai has built a reputation for foolish inaccuracy while also striking fear around job security and the future of the human experience. We are deep diving into Ai and how it can help and harm our society, profession, and environment. We asked our Strada Architects and self-proclaimed tech nerds Mark Hensler and Aaron Bell how they see Ai, and how it can be harnessed for the betterment of the architectural world. Our last step? Asking ChatGPT the same questions!



Strada recently attended [the Ai Horizons Conference](#), where we asked attendees this question: How can Ai shape the future of cities?

### **What insights emerged through this conversation? What are your reactions?**

**Mark:** It was interesting getting all the nerdy brainpower from Pittsburgh in one space. Google executives, Carnegie Mellon University thought leaders, and Governor Josh Shapiro were some of the Ai authorities in attendance. We were a bit of an outlier in that we didn't offer Ai tech solutions at the event. It was less what we do now, and more what we could do. My key takeaway was how much Ai is centered around data processing. Understanding the deep thinking involved in processing all the info we can gather relates directly to the many types of Ai that are custom-tuned to the problems they are trying to solve for. Its more Augmented than Artificial intelligence. Ai is processing in a way that we can look for patterns that help us learn more efficiently.

The ethics of Ai were a hot topic. How do we regulate something that the public already has some access to? The level of harm versus the level of help Ai can influence depends on the morality of the people using it, and the morality of people who are creating it. The speed of adoption for this technology is 10 times faster than the PC. It's revolutionary.

**Aaron:** It's that morality aspect that sticks, right? Take smart cities for an example. [Using Ai sensors in sewers](#) can provide real-time data that could detect early signs of illness. How sick is the city today? How sick was it yesterday? How can we react? It seems great, but is it an invasion of privacy? Is it collecting data that isn't a city's role to take? Could someone use that biological data to create harm?

Ultimately, we aren't in the business of prediction, but it's important to look at Ai as a potential tool for the betterment of people. Automatic driving could revolutionize cities! Less need for parking, removing parallel parking, reclaiming land for people. The instant reactivity of an Ai-driven vehicle could reduce reaction times in a traffic situation to nearly zero, which would ultimately reduce traffic overall. Using Ai to reclaim the world for people, the loveliness of a clean world, that would be great.

**Mark:** An interesting and optimistic view! It goes back to that adoption rate. Some people might not want to give up control, but there really aren't many jobs left that don't work with computers in some way. Once we are a few generations into the Ai landscape, fear should dissipate and benefits should emerge, like shorter travel times, reduction of climate impact, and efficiency of traffic.



**Aaron:** Uber replaced most taxis, Ai could help replace our own cars if we can see the economic benefits. Owning a car could be a thing of the past. Maybe that goes beyond Ai, but they're absolutely connected.

**ChatGPT:** [AI can optimize urban planning](#)

by analyzing data on traffic, energy use, and infrastructure. It can design smart cities that are more sustainable, efficient, and responsive to residents' needs. AI-driven simulations can help plan transportation, reduce waste, and manage resources like water and electricity. Through predictive modeling, AI can foresee urban growth, helping cities adapt to environmental and social changes.



Generative Ai in Urban Planning Prototype

## What does Ai not understand about Architecture? Can it learn?



Ai friends checking blueberries

**Mark:** Ai only knows what it's been taught, so once we decide to teach it something, it can learn everything we want it to know. Former CMU professors have founded [Bloomfield Ai](#), which uses high-resolution cameras mounted on tractors to determine the status of a farmer's crop. Currently focused on blueberries, Bloomfield can determine if a crop needs more or less water, or if pollination needs a boost. This knowledge needs to be shown, not just told, and is typically handed down between generations of farmers.

By giving Ai that information, data points can be quickly assembled to help a network of farmers to understand how crops are performing. If we can teach Ai the difference between a ripe and underripe blueberry, it seems like we could teach it anything! I'd love to see it take one of the Architecture licensing exams to see what it knows already.

**Aaron:** I think about Ai in two categories. There's general Ai, which is language models, ChatGPT, the built knowledge from internet data, and for architecture would be things like the history of the practice and code data. This sort of Ai, I'm reluctant to use for things like Specifications writing, because Ai sort of hallucinates to fill in gaps in its' own knowledge.

And then there's specialized Ai, where it's trained on a specific task or problem with defined points of success or failure. Just like any tool, Ai's success is in how you apply it to a problem. So maybe it's not what it does and doesn't understand about architecture, but how the people who do understand architecture invest in Ai. Ideally, that would be developers, both of spaces and of tools like Revit, but likely architects themselves will need to push for the potentials of Ai to get investment in the right places.

**Mark:** Universities are starting to do this by teaching architecture students about the possibilities. Code analysis, life safety plans, those would be great uses of Ai, but money is always going to be the driver. I'd like to see Ai used for cost-effective solutions for the tedious tasks so our own efficiency can increase while diving more deeply into creative solutions.

**Aaron:** It goes back to the blueberries, really. We don't need Ai to go and pick the blueberries, but by using it to track growth and needs, it can lead to massive time and cost savings. If we can harness Ai to complete the non-creative and time-consuming aspects of architecture, we can pass that savings on to a client, allowing for more to happen with their budget.

**Mark:** I'd be curious to see how that shakes out. The blueberries, at the end of the day, still rely on farmers to interpret the data to create a better crop for consumers. Things like ArchiCAD, Autodesk, and Revit require a trained professional to use successfully, and so in that sense, we are the consumers of Ai, but the benefit is being purchased by the client.

**Aaron:** I agree. Ai could allow us to really make buildings into products, and maybe even lower rents as studied structures in Ai architecture are created.

**ChatGPT:** Ai struggles with emotional, cultural, and aesthetic aspects of architecture—elements deeply tied to human intuition and creativity. While Ai can learn from data, it can't fully grasp the emotional or philosophical nuances that define architecture's human-centered approach. Ai might improve in interpreting human preferences, but replicating true creativity remains a challenge.

**Anthropic CEO Dario Amodei had this to say about Ai:** “Mostly, it's a fact of nature. We don't get to choose, we just get to find out which world we live in, and then deal with it as best we can.”

### What is the world of Ai in architecture like now?

**Aaron:** I don't think it's quite there yet. On the generalized side, there are obvious benefits for us and other businesses in any field. Help with writing, researching, and collection of information is common, though it needs to be treated as an unreliable narrator, so it's more of a starting point. I've tested putting Specifications through Ai, and it can generate ideas, but every aspect still needs checked.

Coding is something I'd like to really harness with Ai. There's Object Creation in ArchiCAD, which allows you to copy code into the GDL Script Editor and create elements. Both Rhino and Grasshopper can write useful scripts for Python. Essentially, it's a superpower you can learn, but it does take adjustment.

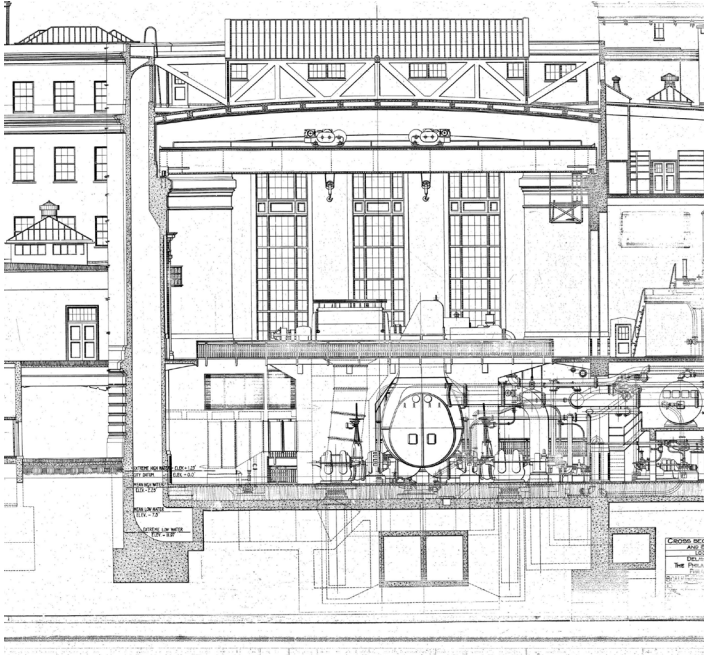
**Mark:** Those all sound really interesting. The next steps make me a little nostalgic for those quintessential “intern tasks”, but why spend hours on something that can take minutes?

**Aaron:** Exactly. Adobe is showing us ways to save time through [Generative Ai](#). You can lasso a spot, type in a prompt, and iterate that generation until you get what you need. TVs are using Ai to upscale low DPI (dots per inch) content to meet larger TV sizes. Generating seamless textures is another Ai development for texture maps. Tiling like this used to be a long manual photoshop process, but now it's happening in seconds.

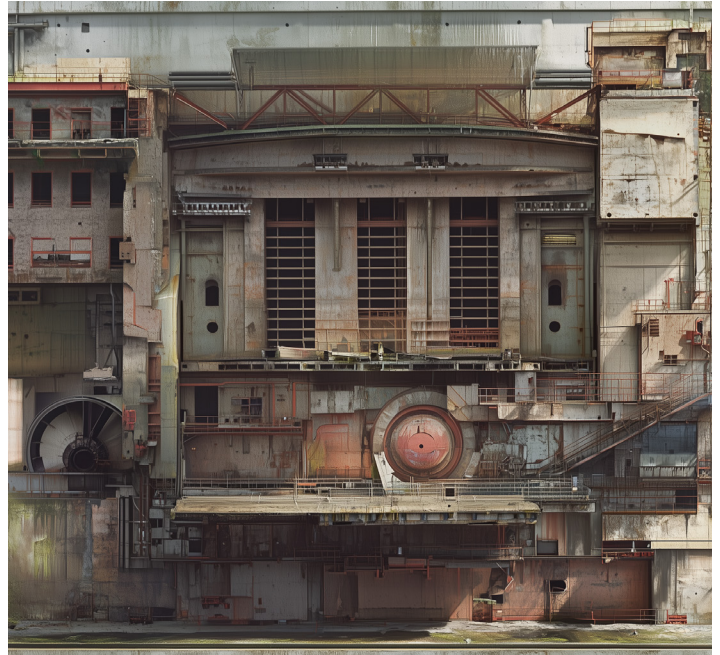
**Mark:** And that's the truth of it, really. Most things humans have created over centuries have been to give us the time to do more things we care about. We hope that means time with our families and our interests, but realistically it's just putting more things on our plates. So it's less luxury and freedom, more “wouldn't it be nice to spend less time on emails?” and focusing on the aspects of a job that we enjoy to make them more interesting and effective.



**Aaron:** I'm not so optimistic that we'll have a choice. We work in a competitive space. If others can reduce schedule, they'll win the work, so that makes understanding and incorporating Ai a race.

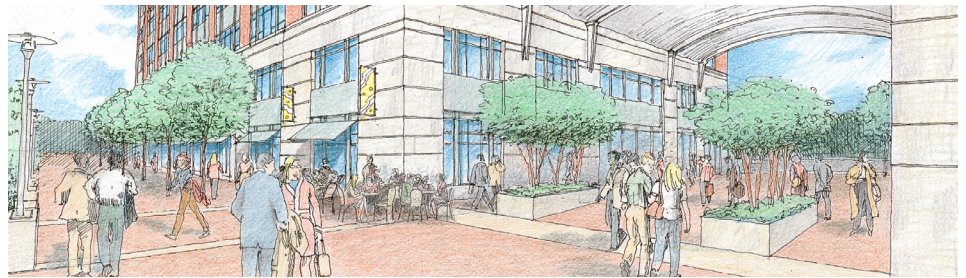


Original Architectural Sketch of The Battery in Philadelphia



Ai Treatment of Architectural Drawing of The Battery in Philadelphia

**Mark:** When we went from hand drafting and building chip board models to PC modeling, I'm sure there was pushback. Even hand sketching is more commonly done on iPads than paper now. I also like to use the rendered models to "walk" through the space for my own thought process.



Hand-sketched rendering by John Martine

**Aaron:** Thought process feels like what it should all be about. If you can hit a button and get 10 versions of a building that hits all criteria and is buildable, you just skipped weeks if not months of thinking. It's an iterative process to design, and there's value to taking the time for that process. Ai can generate ideas without the human wisdom to exercise judgement. I do worry it could kill this profession if we aren't careful.

**Mark:** Yes, Ai can give you an answer, but it can't really tell you why. It creates a distance where Ai could just start giving us results that we accept because the data is good enough. But the WHY is lost. Faster isn't inherently better, but it can enhance our "why" as long as we use it to empower the thought process rather than use it as a crutch.

**Chat GPT:** AI in architecture focuses mainly on enhancing efficiency—automating design processes, generating blueprints, optimizing energy use, and speeding up construction workflows. AI tools help architects with data-driven decision-making, but the creative, intuitive, and emotional dimensions of design are still human-led. AI is an assistant rather than a visionary in architecture today.

Author and Management educator [Ethan Mollick of the University of Pennsylvania](#) is looking ahead at Ai and the implications it could bring, through both continuation of the current trends and the possible creation of AGI, or Artificial General Intelligence, that would essentially do human tasks better than humans, saying, “AI is not a future technology to be dealt with if it happens, it is here now and will require us to think about how we want to use it.”

### What is your reaction to this statement on AGI?

**Aaron:** AGI is like the I, Robot version of the future, where there’s an omniscient singular collection of knowledge and humans are replaced. True AGI, when it comes, will be the most disruptive thing in history. Maybe it’s science fiction, but it feels realistic.

I’d like to see it take on big challenges. In architecture, we aren’t trying to solve every problem, but we can make our work more sustainable by understanding carbon footprint and adapting our designs to increase sustainability overall. At the urban scale, Ai could be used for smart energy grids, adapting HVAC systems to the finest changes in weather conditions. I’d like to see more of that, using Ai to keep tabs on things we really can’t. Interfacing climate issues and sustainability with modeling could allow us the time to bring more artistic elements back into architecture.

**Mark:** My take is that, look, I’m definitely not smarter than Einstein, but I do understand more about physics than he did because of where I exist in history. Einstein created the math, but the research continued past his time. We understand so much more about our universe because someone took the time to understand the math and connect data points. With Ai, data points are connected more quickly, allowing us to think deeper. I hope AGI emerges in an assistant role, helping humans to be better rather than replacing them. With architecture, I would like AGI to help us design more energy efficient buildings, and analyze our construction processes.

**Aaron:** A current preoccupation of mine is that modern architecture is pretty standardized. We used to have more craftsmen involved. Most of our favorite buildings have inlays, molding, patterns, filigree... art! There’s a serious absence of decoration in modern architecture. Nowadays, the best building is the most efficient machine, which is, well, boring. A new building in Philadelphia could have an identical across the country. I’m hopeful that Ai, and AGI, could allow us to create more complex and visually interesting building elements. I’m not saying complexity to be complex, but to return to beauty. I want Ai to help me 3D print columns and facades that bring interest with a lower financial impact.

**Mark:** Why aren’t we doing that? It seems like the technology exists. I also think that Ai’s benefit here is in what we said before, about taking time used on menial tasks and applying that budget to more meaningful design. We still have skilled laborers who can create interesting facades. These talents aren’t totally lost yet, so why not use Ai to give us the time to return to craftsmanship?

**Aaron:** I feel like this is less an issue of time, and more the sheer costs of things being so high that building parts need to be made cheaply and quickly. Ai can’t really give us a lot of time back on the construction side in its’



London practice Blast Studio has developed a method for 3D printing with living mycelium and used it to form a column that could be harvested for mushrooms before serving as a structural building element. The Tree Column, made of mycelium, is on display at London’s Design Museum.



current capacity, but it can give contractors better and more interesting parts to install in the first place. I imagine job sites with giant 3D printers, ready to make whatever is needed. We need to bring cultural expression back, we need to bring art back, and I want to figure out how to make Ai work with me on that.

**ChatGPT:** Ethan Mollick's statement highlights the urgent need to address the rapid integration of AI into society. AI is no longer a speculative future concept—it's already reshaping industries, education, and daily life. His call to action emphasizes the importance of proactively considering how to leverage AI responsibly and equitably. While the potential development of Artificial General Intelligence raises complex ethical and practical questions, even today's AI systems require thoughtful frameworks for governance, usage, and impact. Mollick's perspective is a timely reminder that the choices we make now will shape how AI benefits humanity while minimizing potential risks and disruptions.

## Carnegie Mellon University considers [Ai one of the 3 great pedagogical challenges](#) to study now, alongside climate change and social justice.

### How do these challenges thread together with your work?



Ai-imagined robot 3D prints a building

**Mark:** Of those 3, climate change is the one we have the biggest impact on as architects. Using Ai to analyze the energy grid and adjust the energy use of appliances is already happening, and will continue to keep coming in ways we won't even realize exist.

Ai is also helping us to see data as patterns, which is massively influential in improving social justice. We're becoming more and more able to see the WHY of what happens in communities, positively influencing things like urban planning and site analysis. Augmenting the instinct of urban design with actual data to contradict or support those gut reactions will make for better places. It's powerful to think that Ai will help pull back the curtain on a lot of things, force us to consider the built environment in new ways, and reveal how we interact with each other and the environment. Hopefully we have good solutions as these social and environmental answers emerge.

**Aaron:** I connect climate change directly with sustainable building, reducing carbon, and efficiency. Strada is making changes for the environment like ruling out PVCs and reducing other toxic materials through our Healthy Materials Action Plan, and pursuing LEED and smart building projects.

Social justice is trickier for architects since we typically deal with a single space. We're a small piece of a larger process, so it's important that we engage in conversations that inform our work in ways that support social justice and equity. We are advocates, and we can lead responsible updates in underserved areas if we work with the communities directly.

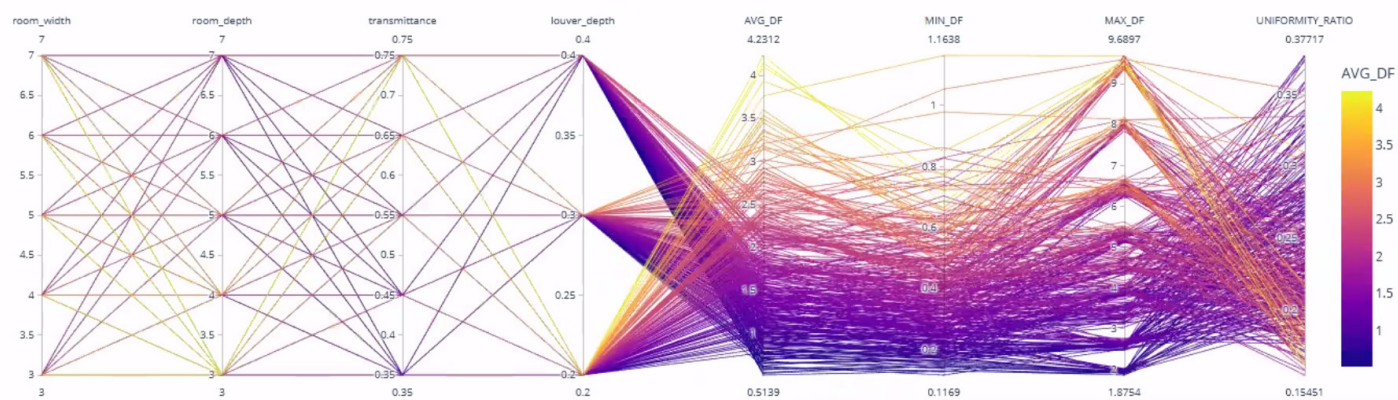
Ai hasn't disrupted as much as we thought it would yet, but it will, and we can influence those outcomes by being intentional and steering use in an anticipatory way.

**ChatGPT:** These challenges intersect in building equitable, sustainable futures. AI can help design energy-efficient buildings, mitigate environmental impact, and create inclusive urban spaces. Addressing social justice, AI can analyze disparities in infrastructure, improving accessibility and fairness in urban development. Together, they form a framework for ethical and responsible innovation.

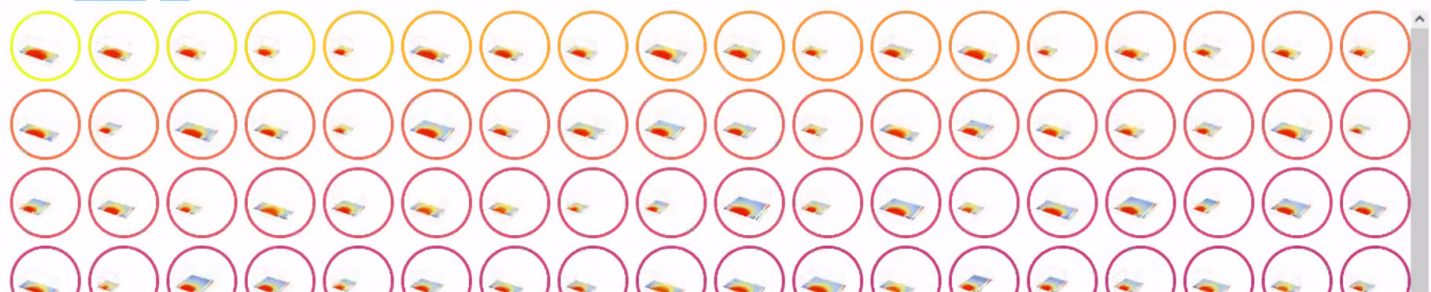
☒ Sample Project ☐ Load from a Pollination project (Coming soon)

Select sample Daylight Factor ▾

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Ai comparisons: cove.tool Iterative Massing Analysis based on daylight factor

## Are tools like [Midjourney](#) a threat or an asset to architecture?

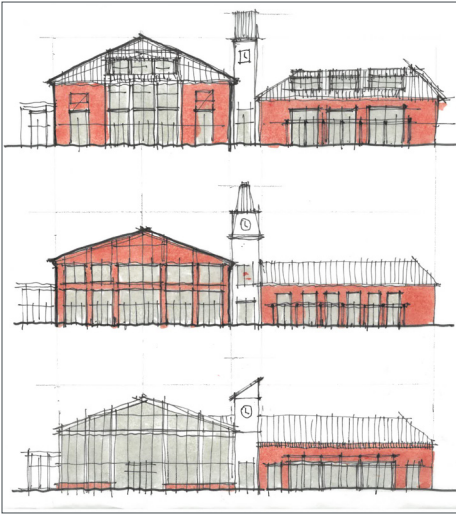
**Mark:** An asset for sure. It's still largely just pretty pictures, like a Google image search with a generative edge. Tools like Midjourney, when used properly, can go a long way in sparking dormant creativity. There's a sense of assistance there that can help expand our imaginations, move us forward if we get stuck.

**Aaron:** My worry with Midjourney is that it gets to a result really quickly, but you don't know how it got there. It's all about speed, without regard for better or worse. There's value in struggling with ideas, doing historic research, learning the underpinning of a built concept. You just don't learn when Ai does things for you. So much of architecture is systems and components and assemblies. My heart is in the space of learning, and I don't want to lose sight of struggling through ideas to understand each part of a problem.

A great example is [Biosphere 2](#), a geodome created as a research tool. The trees grew far more rapidly upwards than in nature, and then fell right over. The lack of wind meant the trees did not respond to nature, and so they weakened and collapsed. We humans also benefit from force, like exercising! Stress in the right context is what helps us strengthen and grow.

**Mark:** I completely agree. We're drifting back to Ai ethics. There are reasons kids are not allowed to use Ai for their schooling. My high school son had asked me why he needed to write an essay on *To Kill a Mockingbird*, and I explained it's teaching you how to think in new ways. There's so much value to thinking and learning. It's what makes the difference between machine and human. As much as I love the idea of Ai to boost creativity, it needs used sparingly or creativity would ultimately be stifled.

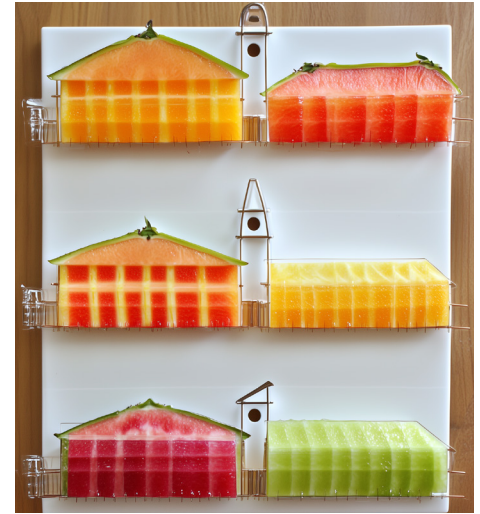




A sketch done by hand



The hand sketch rendered in Ai



**Mark:** Ai is more helpful in connecting data points to help us go 20 layers deeper on a problem. I personally love the process of creation, but would entertain Ai as a critique and an expander of thinking, like a friend you bounce ideas off of. Using it just to create things quickly will stunt us as a society.

**Aaron:** Yes, it has to supplement human processes. You have to have tactile relationships in architecture. Ai is a tool, but it requires ethics behind it. If we keep asking it for stuff with no process, we'll be buried with useless ideas.

**Mark:** Between the CMU event and this conversation, I've really felt a shift in my understanding of Ai. I had seen it as just a replacement for mindless tasks, but now I feel more optimistic.

**ChatGPT:** Midjourney and similar tools are assets, enhancing creativity and speeding up visualization processes. They allow architects to experiment with concepts quickly and collaboratively. However, the risk lies in over-reliance on such tools, which may diminish the human touch in design, creativity, and intuition that are essential in architecture.

# Strada