

Assignment 2: Translating with AI

Value: 20% of Final Grade

Format: Individual Project

Deliverable: 4-Page 11×17" PDF (Landscape) + Process Documentation (min. 2 pages, letter-size PDF)

Background

When OpenAI released DALL-E in January 2021, one image captured public imagination: the "avocado armchair." Given the simple text prompt "an armchair in the shape of an avocado," the AI generated plausible furniture designs that merged two completely unrelated concepts — the soft curves of a halved avocado became chair backs, the pit became cushions. What made this remarkable wasn't the visual novelty, but that **AI could combine discrete, unrelated elements into geometrically and functionally coherent objects** ([MIT Technology Review, 2021](#)). This capability — bisociation, or combining unrelated conceptual matrices — has been central to architectural thinking for over a century, but AI now accelerates it exponentially.

The practice of translating everyday objects into architectural language has deep historical roots. In the early 1920s, Le Corbusier created still life paintings depicting overlapping domestic objects — bottles, glasses, guitar — arranged in shallow, layered compositions. These studies directly informed Villa Stein at Garches (1927): transparent, overlapping planes creating spatial depth. Frank Gehry's study of fish movement and scale patterns in the 1980s culminated in Guggenheim Bilbao (1997), where titanium panels don't mimic fish shape but capture the shimmer and optical fluidity of scales catching light underwater. PTW Architects with Arup used the Weaire-Phelan structure — soap bubble molecular geometry — to design the Beijing National Aquatics Center's (2008) steel frame, translating molecular packing efficiency into architectural structure.

Contemporary digital practice has accelerated this through AI workflows. Hassan Ragab uses Midjourney to generate hundreds of variations exploring how coral reef growth patterns might inform facade systems ([DesignBoom, 2022](#)). Studio Tim Fu pioneered "AI-first" practice — their Lake Bled Estate project (Slovenia, 2024) used AI to analyze local vernacular architecture (the *rizalit* timber element), then synthesized heritage data with contemporary requirements to generate six villas in two months ([Studio Tim Fu; Architizer Journal, 2025](#)). At Pratt Institute, Robert Brackett photographs textures, feeds them to AI, then CNC-mills outputs in concrete ([Pratt, 2024](#)). At UT Austin, Daniel Koehler has students build physical models, photograph them, generate thousands of AI variations, then curate ([UT Austin, 2024](#)).

In this assignment, AI is your primary exploration tool. Unlike rule-based methods like Grasshopper (where you program every step), working with AI is conversational and unpredictable. You describe what you want, AI interprets it, you refine your description, and together you iterate toward a design. The most successful projects will develop a hybrid workflow — moving fluidly between hand sketching, AI generation, Rhino modeling, Photoshop editing, and back to AI. You define the translation strategy, curate the outputs, and make design decisions. AI generates; you direct.

AI tools: Nano Banana (access via gemini.google.com; additional credits will be shared), [Meshy.ai](#) (paid account & password in "Additional Notes" below). You may use other tools as well. Specify all AI

tools in your documentation.

The Task: Object-to-Architecture Translation

Phase 1: Object Selection & Translation Strategy

Select an everyday object and identify how its qualities can inform architecture — not just what it looks like.

Object Categories:

- **Artifacts:** Industrial products, food, tools, musical instruments (coffee maker, guitar, LEGO bricks)
- **Art and Material Expressions:** Paintings, sculptures, origami, textiles (Mondrian painting, origami crane, woven basket)
- **Natural Patterns and Forms:** Biological structures, geological formations (pinecone, coral, seashell, canyon layers, honeycomb)

Translation Strategies (Pick 1~2):

1. Spatial Organization: How does your object organize space or movement?

Example: Nautilus shell's logarithmic spiral → circulation that expands outward from compressed core, spatial volumes growing proportionally

2. Structural + Material Logic: How does your object stand up, distribute forces, fold, bend, or assemble?

Example: Origami folding → deployable facade system where rigid panels rotate along scored fold lines to modulate light and ventilation

3. Growth or Formation Process: How did your object come to be? How does it change over time?

Example: Coral reef accretion → building whose massing aggregates incrementally around structural armature, each phase adding density and porosity

4. Cultural or Symbolic Meaning: What does your object represent? What stories does it tell?

Example: Kengo Kuma's M2 Building uses scaled Ionic columns — not as structure, but as cultural fragments questioning classical architecture's meaning in commercial context

💡 **Avoid pure mimicry.** Emphasize deeper connections — functionality, materiality, process, or cultural significance.

Design Scope: Not limited. Choose a scale that best explores your translation strategy — could be a small pavilion, a building complex, an urban massing study, a facade system, or a spatial detail. What matters is how well the scale serves your concept.

Phase 2: AI-Driven Design & Fabrication

💡 **The approaches below are examples, not requirements.** Develop your own hybrid workflow that works for your concept. Mix and match, skip steps, or invent entirely new approaches. What matters is the quality of your exploration and final design.

2.1 Ideation (Starting Points)

Sketch → AI Exploration

Hand-sketch 2–3 translation concepts. Use sketches as input images in Nano Banana with text prompts describing your strategy. Generate 10–15 variations exploring different interpretations.

Physical Model → AI

Build rough physical models (clay, foam, cardboard). Photograph from multiple angles. Use photos as AI input to explore material, atmosphere, and detail variations.

Moodboard Collage → AI

Collect reference images (object close-ups, material textures, spatial references). Use AI to synthesize them into architectural propositions.

2.2 Digital Development (Example Workflow)

Generate Multiple Mesh Options

Select 3–4 strong AI images. Use [Meshy.ai](#) to convert each to 3D mesh. Import all to Rhino and compare side-by-side. Evaluate: Which captures your translation strategy best? Which has interesting spatial qualities? Which is structurally coherent?

Hybrid Modeling

Select the most promising mesh. **Don't just use the raw mesh** — refine it:

- Use mesh editing tools to adjust proportions, openings, details
- Combine with NURBS modeling for specific architectural elements (floors, structural members, openings)
- Use SubD modeling to smooth or articulate surfaces

Iterative Loop

Move fluidly between: Rhino edits → export views → generate new AI images → compare digital model to AI vision → refine model. Each medium informs the next. Document this back-and-forth process.

Test Prints (Optional)

Print small test sections to evaluate detail level, openings, and concept clarity. Adjust digital model based on what you learn.

💡 **Your process may look completely different** — some students might start with Rhino models, others might iterate entirely in 2D AI before touching 3D. Document whatever workflow you develop.

Phase 3: Final Deliverables

3.1 Physical Model

Your final 3D print model can be:

- **Full building** (if scale allows clear reading)

- **Critical section cut** (showing internal spatial relationships)
- **Facade detail** (showing material/structural logic at larger scale)
- **Spatial moment** (threshold, entrance, key architectural condition)

Requirements:

- Maximum size: **8×8×8cm**
- Must show evidence of digital refinement (not raw AI-generated mesh)
- You keep the physical model (bring to pin-up March 6)
- Take photos of your physical model and include them in section 3.2

3.2 Design Portfolio (4-Page PDF)

Use Nano Banana to generate final architectural drawings: perspectives, plans, sections, section perspectives, diagrams — a full set of hybrid AI + manual images.

Treat this as a **mini-studio submission**. Organize content clearly across 4 pages (11×17" landscape).

Suggested content:

- **Concept:** Object photos, translation statement (3-4 sentences), brief design description
- **Process:** Early AI explorations, generative diagrams showing form development
- **Final Design:** Primary perspectives, plans/sections, atmospheric views, detail views
- **Physical Model:** 4-6 photos from multiple angles, scale reference, detail shots, brief caption

3.3 Process Documentation (minimum 2 pages, letter-size PDF)

This is a **narrative with screenshots** — a simple Word or PDF document showing your design journey.

Include:

- How you moved between AI, sketching, and 3D modeling
- Key text prompts and input images at each stage
- Screenshots of important iterations and turning points
- Your mesh generation and refinement process
- What worked? What didn't? How did you revise?

Answer these three questions (total ~300 words, include screenshots):

1. What was your most effective prompting strategy, and how did it evolve? (Show early vs. late prompt comparison)
2. At what point did you override or reject AI's output — and why?
3. What did you learn about AI's strengths and limitations as a design partner?

Submission Requirements

Miro Pin-up: https://miro.com/app/board/uXjVG921kok=?share_link_id=193974412410; Password: UBCSALA2026

- **March 5, Thursday 11:59 PM** — Pin-up on Miro
- **March 6, Friday** — In-class pin-up (bring physical model)

Final Canvas Submission (March 13, 11:59 PM — extended one week to allow time for 3D printing)

1. **Design Portfolio** (4-page PDF, 11×17" landscape) — see Phase 3.2
2. **Process Documentation** (min. 2 pages, letter-size .doc or PDF) — see Phase 3.3

Grading Rubric (Total: 20 pts)

Grading emphasizes design thinking and exploration process, not just visual polish.

Criteria	Weight	Description
Translation Depth	20% (4 pts)	Goes beyond visual mimicry; demonstrates clear translation strategy; shows conceptual thinking about how object qualities become architectural qualities
Design Quality	25% (5 pts)	AI-generated imagery shows iterative refinement; architectural proposition is convincing and spatially coherent; creative and effective use of AI as design collaborator
Physical Model	30% (6 pts)	Model shows evidence of design exploration and digital refinement (not just raw mesh); thoughtful representation choice; successful fabrication (clean geometry, appropriate detail)
Process Documentation	15% (3 pts)	Clear demonstration of workflow with prompts and input images; shows iteration and decision-making; transparent process with screenshots
Reflection	10% (2 pts)	Thoughtful answers to three reflection questions; shows learning progression in prompting; demonstrates critical awareness of AI's role and limitations

Additional Notes

- **Nano Banana** examples from Ex2.1: <https://ubcdesignmedia.notion.site/>
- **Meshy.ai Shared Accounts** (log out of personal account first, then sign in):
 - **Last name A-G:** ubcsalaai+01@gmail.com
 - **Last name H-L:** ubcsalaai+02@gmail.com
 - **Last name M-Z:** ubcsalaai+03@gmail.com
 - **Password (all accounts):** UBCsalaDM2

Each student has ~200 credits for ~20 high-quality downloadable models +8 free retries for each task — should be enough for this exercise. Instructor will monitor accounts and reload credits if

needed. Message instructor if you have access issues or credits run out.