

GSAPP | Architectural Portfolio

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2024-2025



Studio Projects

01. Pollinized Ministerios SP 2025_Juan Herreros & Oscar M. Caballero

02. Every Island is a Mountains SU 2024_Marco Ferrari & Elise Hunchuck

03. Adaptive Islands FA 2024_Bryony Roberts

Elective Project (Visual Studies & Computation)

01. Re - "Making Studio" SP 2025_Danil Nagy (Generative Design I)

Theoretical Writings (History & Theory)

01. Le Corbusier's Evolution in Circulation: From Determinacy to Indeterminacy and Its Parallels with Rem Koolhaas FA 2024_Mary McLeod (Le Corbusier beyond Europe)

02. How the Theory Works: Focusing on "Field Trip: A Memoir," Rem Koolhaas

FA 2024_Mark Wigley (The History of Architectural Theory) 03. Contextualizing a Concept: The Solid / Void Concept from Y2K House to Casa da Música SP 2025_Bernard Tschumi (The Contemporary: "SCH00LS?")

04. From Casbah to Viaduct: Le Corbusier's Visual Analysis and the Abstraction of Algiers SP 2025_Amale Andraos (The Arab City)

Pollinized Ministerios

How should housing for both people and pollinators transform?

Year: Spring 2025, Columbia University Instructor: Juan Herreros & Oscar M. Caballero Project Type and Purpose: A collective housing designed to restore Madrid's biodiversity Project Location: New Ministries, Madrid, Spain Keywords: Living Ruin, Pollinators, Granite Façade, Collective Housing



Reassembly and greening of the granite façade:

From solid façade to habitat for pollinators



How should Madrid's Nuevos Ministerios-once a dry, imposing government complex-be transformed? Could it become not just a place for people, but the starting point for reviving

The transformation begins with the building's granite façade. Originally finished with brick, the façade was later clad entirely in granite during Franco's dictatorship to symbolize the strength of the regime. Peeling away this granite skin not only restores the building's architectural porosity, but also dissolves its symbolic authority into the public

The removed granite blocks are not discarded-they are reborn as habitats for pollinators, essential agents of biodiversity. Reassembled around a central soil core, these blocks form a new wall of granite, stacked with intention and care. Within the cracks of this wall, flowers and plants emerge, creating an ecosystem for pollinators to thrive. The material porosity created by the stone and soil merges the once-detached Nuevos Ministerios back into both the

ruins, will in time be colonized by plants and pollinators. Unlike the dry architecture of the past, they will become living ruins—structures that grow, evolve,

This façade will not simply be a green façade, but a façade of green-a functional ecological hub capable of revitalizing biodiversity across Madrid.

AMPHITHEATER

POLLINATOR CORRIDORS OF GRANITE





Changing the character of the residence through wall transformation 5

Granite façade fragment analysis and reassembly:

The foundation of a living ruin



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Documentation of the shape and size of the granite fragments in the façade



Details of the new granite wall section, elevation, and its gradual colonization by plants







Experimental planting in the crevices of stone and concrete

Every Island is a Mountain

How has colonial architecture contributed to the acceleration of environmental crises?

Year: Summer 2024, Columbia University Instructor: Marco Ferrari & Elise Hunchuck Project Type and Purpose: A research project on how colonial histories and Western architecture have driven environmental destruction in Mongolia and Tuvalu Project Location: Ulaanbaatar, Mongolia / Funafuti, Tuvalu Keywords: Colonialism, Environmental Destruction, Introduction of Western Architecture Final Project Video: <u>https://www.youtube.com/watch?v=e8Z7DJYRiz0&t=2s</u>



Tuvalu





Tuvalu's topography at different scales

The islands of Tuvalu originally adapted to changing water levels, shifting dynamically and altering their shapes to survive. Following this natural rhythm, the indigenous people of Tuvalu also moved between islands to sustain their way of life. However, in 1916, under British colonial rule, the concept of borders was introduced, and the people of Tuvalu were forced into permanent settlements.

This drastic change in lifestyle led to the establishment of fixed housing and infrastructure, which disrupted the natural mobility of the soil. This process was further accelerated during World War II, when the U.S. military stationed in Tuvalu built numerous military bases. As a result, Tuvalu is now unable to respond to rising water levels caused by global warming, placing the nation in a state of existential crisis.

Map of sea level rise across Tuvalu's islands: darker areas indicate higher rates of sea level rise.

Mongolia









Mongolia's topography at different scales

Mongolia's naturally fragile soil shaped its people's nomadic lifestyle. They lived in portable gers, which allowed them to move freely without harming the land. However, everything changed in 1921 under Soviet colonial rule. To impose collective socialism, the Soviets forced Mongolians into permanent settlements, introduced the concept of urbanization, and confined livestock raising.

To solidify their control, the Soviets rapidly built Western-style structures and infrastructure, such as highways and railroads. These immovable developments prevented Mongolia's fragile soil from recovering, accelerating erosion and leading to landslides, floods, and droughts. The compounding effects of these issues have ultimately resulted in severe desertification across Mongolia.

1.Brown: Expanding desert areas 2.Green: Deforestation areas 3.Yellow: Expanding cropland areas

The impact of colonial architecture: Expansion of desert areas parallel to urban growth



Flood-prone areas caused by modern urbanization, land reclamation, and borrow pits



Detailed map of urban expansion at a small scale & corresponding large-scale map of desertification

Data visualization: Relationship between colonial architecture and the environment











Adaptive Islands

How can architecture contribute to the mental health of architecture students?

Year: Fall 2024, Columbia University Instructor: Bryony Roberts Project Type and Purpose: Renovation of Avery Hall (Architecture Building) at Columbia University Project Location: New York, USA Keywords: Neurodiversity, Mental Health, Autonomous Spatial Change



Interior spatial strategy:

Partition system and integration of nature

Spaces must adapt to the changing functions of the studio. A partition system allows students to adjust spaces autonomously, adding flexibility. The courtyard introduces nature, enhancing both partitioning and students' mental wellbeing.



Exterior spatial strategy:

Extension and courtyard enhancement

To reduce the density of studio space, part of Fayerweather next to Avery is repurposed for the department of architecture. An extension connects the buildings, serving as a classroom by day and a flexible studio by night. The unused courtyard between two buildings is turned into a small park, introducing nature and natural light into the library.



Extensions linking Avery and Fayerweather, actively integrating nature into the courtyard



Horizontal Sliding Door



Horizontal Folding Door

Interior Courtyard











An interior studio with partitions opened to create a spacious group activity area

A bright and spacious library enabled by the open courtyard 15



Design development process sketches exploring connections with nature





Re-"Making Studio"

How can we automate the smartest use of space?

Year: Spring 2025, Columbia University Instructor: Danil Nagy Course: Generative Design I (Visual Studies & Computation) Project Type and Purpose: Reorganization of Making Studio Machines and Desks Using Grasshopper and Python Final Report: https://medium.com/@yh3788/re-making-studio-d50a47982114



Machine and desk layout in the making studio:

Development of an automated system using grasshopper and python



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Step 1: Define Usable Geometry

Input a closed boundary polyline representing the room. Draw polylines to indicate doors, columns, and other blocked zones. Subtract these from the main polyline to create usable wall segments.

Step 2: Place Machines

Users input machine width and depth in a panel and set safe distances via a slider. Machines are then auto-placed along wall segments-spaced by width plus clearanceand oriented to the curve's tangent.



Step 3: Buffer Zones

The system uses user-defined buffer distances to create clearance zones. The buffer value is controlled by a slider and used to offset the machine footprint. These zones help ensure safe circulation around machines.



Step 4: Desk Placement

A grid of candidate points is generated in the remaining space. Desks are placed at valid locations, avoiding buffers and walls. The system allows clustering desks in groups of 2 (largeCount) or 4 (megaCount), and lets you set the total desk count (totalCount).



Python script for placing machines along the wall based on the input sizes in Step 2

import Rhino.Geometry as rg machine_sizes = [] for item in y: try: raw_text = item.Value.strip() if hasattr(item, "Value") else str(item).strip() for line in raw_text.splitlines(): parts = line.strip().split(',') if len(parts) == 2: w = float(parts[0].strip()) h = float(parts[1].strip()) machine_sizes.append((max(w, 0.01), max(h, 0.01))) except Exception as e: print("Parsing error for", item, "", e) print(": machine_sizes:", machine_sizes) boundary_center = u.GetBoundingBox(True).Center # u = boundary curve def is_overlapping(poly, others): crv = poly.ToNurbsCurve() for other in others: res = rg.Intersect.Intersection.CurveCurve(crv, other.ToNurbsCurve(), 0.01, 0.01) if res and res.Count > 0: return True return False rectangles = [] machine_index = 0 for curve in x: if machine_index >= len(machine_sizes): break length = curve.GetLength() t_step = 1.0 t = 0.0 while t < length and machine_index < len(machine_sizes): w, h = machine_sizes[machine_index] spacing = w + z if t + w > length: break center_t = t + w/2ok, param = curve.LengthParameter(center_t) if not ok: t += t_step; continue pt = curve.PointAt(param) tangent = curve.TangentAt(param); tangent.Unitize() normal = rg.Vector3d.CrossProduct(tangent, rg.Vector3d.ZAxis); normal.Unitize() if u.Contains(pt, rg.Plane.WorldXY, 0.01) != rg.PointContainment.Inside: normal = -normal start = pt - tangent*(w/2) end = $pt + tangent^{*}(w/2)$ p1, p2 = start, end p3 = end + normal*h p4 = start + normal*h poly = rg.Polyline([p1, p2, p3, p4, p1]) poly = rg.PolylineCurve(poly) if is_overlapping(poly, rectangles): t += t_step; continue rectangles.append(poly) machine_index += 1 t += spacing a = rectangles

Python script for placing desks within the defined boundary in Step 4

import math, random if cap+1 <= totalCount: import Rhino from Rhino.Geometry import (Point3d, Rectangle3d, Plane, Interval, if not opts: Vector3d, AreaMassProperties, Circle break random.shuffle(opts) from Rhino.Geometry.Intersect import Intersection def place_desks_and_bins(boundaryCrv, spacing, largeCount, megaCount, totalCount): smallW, smallL = 0.5, 1.0 w, I = w0, I0largeW, largeL = smallW*2, smallL else: megaW, megaL = smallW*2, smallL*2 w, I = I0, w0ds = math.hypot(smallW, smallL) R = Rectangle3d(dl = math.hypot(largeW, largeL) dm = math.hypot(megaW, megaL) step = max(ds, dl, dm) + spacing Interval(-1/2, 1/2) amp = AreaMassProperties.Compute(boundaryCrv)).ToNurbsCurve() if not amp: return[],[],[],[] continue origin = amp.Centroid if typ == 'mega': bbox = boundaryCrv.GetBoundingBox(True) mi = math.floor((bbox.Min.X - origin.X)/step) remM -= 1 ma = math.ceil((bbox.Max.X - origin.X)/step) elif typ == 'large': mj = math.floor((bbox.Min.Y - origin.Y)/step) larges.append(R) mj2= math.ceil((bbox.Max.Y - origin.Y)/step) remL -= 1 coords = [(i,j) for i in range(mi, ma+1) for j in range(mj, mj2+1)] else: coords.sort(key=lambda ij: ij[0]**2 + ij[1]**2) used = set() used.add((i,j)) singles = [] cap += val larges =[] break holes = [] megas =[] remL, remM = largeCount, megaCount for (i,i) in used: if ((i+1,j) in used and cap = 0 def inside_strict(rect): (i,i+1) in used and ts = [0.0,0.25,0.5,0.75] (i+1,j+1) in used): ms = [0.125, 0.375, 0.625, 0.875] for t in ts+ms: if boundaryCrv.Contains(rect.PointAt(t)) == Rhino.Geometry.PointContainment.Outside: return False origin.Z return not Intersection.CurveCurve(rect, boundaryCrv, 0.001, 0.001))) for (i,j) in coords: if cap >= totalCount: break bins = [] if (i,j) in used: if holes: continue P = Point3d(origin.X + i*step)bins.append(origin.Y + j*step, origin.Z) c = boundaryCrv.Contains(P) if c not in (Rhino.Geometry.PointContainment.Inside, Rhino.Geometry.PointContainment.Coincident): continue opts =[] if remM>0 and cap+4 <= totalCount: a = s opts.append(('mega', 4, megaW, megaL)) b = l if remL>0 and cap+2 <= totalCount: c = m d = bins

```
opts.append(('large', 2, largeW, largeL))
     opts.append(('small', 1, smallW, smallL))
    for typ, val, w0, I0 in opts:
     if random.random() < 0.5:
       Plane(P, Vector3d.XAxis, Vector3d.YAxis),
       Interval(-w/2, w/2),
      if not inside_strict(R):
       megas.append(R)
       singles.append(R)
      holes.append(Point3d(
       origin.X + (i+0.5)*step,
       origin.Y + (j+0.5)*step,
  totalDesks = len(singles)*1 + len(larges)*2 + len(megas)*4
  binCount = 0 if totalDesks == 0 else totalDesks//10 + 1
    for c in random.sample(holes, min(binCount, len(holes))):
       Circle(Plane(c, Vector3d, XAxis, Vector3d, YAxis), 0.3)
         .ToNurbsCurve()
  return singles, larges, megas, bins
s, I, m, bins = place_desks_and_bins(
  boundaryCrv, spacing, largeCount, megaCount, totalCount
```

Universal system: Applied to the making studio at the University of Buffalo



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GSAPP | Critical Writings on Architecture

Junhyuk Kim

2024-2025

Year: Fall 2024 Instructor: Mary McLeod Course: Le Corbusier beyond Europe Title: Le Corbusier's Evolution in Circulation: From Determinacy to Indeterminacy and Its Parallels with Rem Koolhaas



Corbusier's concept of circulation

into fragmented, multilayered spatial

experiences—offering users narrative



Rem Koolhaas expanded Le

architecture

Metropolitan Architecture, 2nd ed. (New	
/ Urbanism, November 2006 (Tokyo: A +	34 K
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El Croquis, 1995), 102.	> K

meaning

control

freedom rather than architectural



Le Corbusier's circulation strategies evolved from controlled, linear paths to complex, indeterminate systems that redefined how users engage with



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From the Promenade Architecturale to the fragmented ramps of the Kunsthal, this study traces the shifting role of circulation in shaping architectural

Year: Fall 2024 Instructor: Mark Wigley **Course:** The History of Architectural Theory Title: How the Theory Works: Focusing on "Field Trip: A Memoir," Rem Koolhaas

Summary of Field Trip: A(A) MEMOIR (First and Last ...)



Through the Berlin Wall. Koolhaas highlights the immense power of arch

through this very division

4. The Power of Absence

inevitable negative consequences-division, enclosure, and exclusion. He acknowledg

these outcomes as intrinsic attributes of architecture, exposing the utopian ideals of

The Berlin Wall reveals that the beauty of architecture is proportional to its ability to evo horror. Koolhaas describes the gradual evolution of a simple line on a map into soldiers

vitability. He argues that the progressive development of the Wall transcends its role

even the simplest shapes can hold immense significance. This insight redefines the role of form in architecture, emphasizing that architectural meaning need not rely on form itsel

nues that absence is not merely emotiness but rather a primary force that organizes

barbed wire, and concrete blocks, framing this transformation as an architectural

Ihaas observes that the Berlin Wall severs the traditional rela and meaning. The Wall operates independently of its physical form, demonstrating the

The Wall proves that absence can function more powerfully and flexibly than ence. This disrupts the traditional connection between importance and mass in chitecture, underscoring the architectural force and potential of the void. Koolhaas

liberation championed by 1960s architecture as mere rhetoric. The Wall creates

multiple layers. The first stage of the Wall was not merely a physical barrier of concre bricks, barbed wire, or soldiers-it was fundamentally a decision. This decision was the primitive foundation and essential premise of the Berlin Wall. Without it, the Wall held no characteristics. Its construction became more relaxed, blending into daily life with a bar appearance. The Wall deliberately ranged from overtly political and symbolic forms to those that seamlessly integrated into everyrlay contexts. Over time, the Wall generate various adjunct structures and paraphernalia, giving the impression that it was g

format can function as a theoretical text. It mass heaving merely describing an experience using it as a foundation to redefine the essence of architecture and the possibilities of

evident throughout the text. For instance, Koolhaas initially imagined the Berlin Wall as a s unid concept. The memoir form serves as a persuasive tool, as it share his personal experience, creating intimacy with the reade

smantled, and the rearier is invited to share in this journey of discovery. For e han he states. "The wall was not a fivert object but a situation "he marks the nersona velation that became the foundation of his void theory. This emotional connection sforms the text into more than just an analytical conclusion; it offers readers an

erved. His theoretical claims are not abstract but grounded in concrete and tangib evneriences. For instance, he describes the sand behind the Wall as being "troated like Japanese garden" and "natrium street lamps, their orange glow turned to

he various activities occurring around it.

meaning

What is the intended audience?

his text, which recounts and analyzes Konlihaas's experience of the Berlin Wall, nrimoril acture students of the time. The inclusion of reactions from students at the AA as's presentation, underscores that the theory's initial audience

of this theory lies not only in introducing the concept of the void but also i the way architecture is viewed. It challenges the architectural perspective of the was confined to physical dimensions, and encourages an exploration of efficiency does not solely lie in connecting people or creating heautit

hat identifies it as "theory"? & What argument is made and in what way?

ile Koolhaas's text appears, on the surface, to take the form of a memoir, it transcends olves into architectural theory. The text is clearly divided into tw Eninbanies, these observations are distilled into five structured arguments. This vork elevates the text beyond memoir, establishing it as a work of

al narrative of a memoir as its foundation. Through the reality of the Berlin Wa discovers the void's potential as a space of absence and division that s new meaning and possibilities. He proves that architecture ca hrough absence than through physical form. The text to see architecture through a new lens. In doing so, Koolhaas subver itectural discourse and successfully reconstructs the essence and around immaterial elements such as absence, division, and th

"Field Trip: A Memoir" redefines architectural theory through personal narrative, revealing how division, enclosure, and exclusion can paradoxically generate new spatial possibilities

The Persuasive Strategies and Effectiveness of the Memoir

The text Field Trip: A Memoir naturally introduces the theory of the void, derived from

by its title, is its form as a memoir. Although it was written in 1993, decades after his visit

Absence, rather than presence, can be a more powerful and flexible force in architecture

readers to vividly imagine the Wall's surroundings and join Koolhaas on his journey

Koolhone also amploye quartions to advance his arguments. These rearliers to critically reflect on the text rather than naccively concurse it. For example, w he asks. "Were not division, enclosure, and exclusion the essential stratagems of any architecture?" he directly references the key elements of division, enclosure, and exc

and reinforces the theoretical core. For example, Koolhaas describes the Wall as "an erasure, a freshly created absence," a paradoxical statement that underscores the th central argument. Such linguistic strategies compel readers to rethink the me architecture and space. Similarly, his description of the Wall as "the transg home the significance of absence as a spatial and architectural force.

Thus, the memoir form enables readers to engage with the text not just analytically b experientially. Koolhaas's abstract, ironic, and paradoxical language highlights key points and guides readers to grasp the core of his argument. By allowing readers to indirectly n Koolhaas's experience, the text offers a unique method







contiustee the reader's interset. A prime example is the description of the Wall as "a erasure, a freshly created absence," a paradoxical statement that underscores th central claim: the act of creating absence. This linguistic strategy com think the meaning of architecture and space. Similarly, when Koolhaas d stance in the line "absence would always win in a contest with nesence." Koolha ghlights the concept of abs

The memoir format, therefore, allows readers to engage with the text n analytical exercise but as an experiential journey alongside Koolhaas. The abstract, dentify the moments of significance and gain a clear understanding of Koolhaas's faims. This unique methodological approach enables readers to indirectly share in lhaas's journey, providing a sensory and reflective path to

How does this theory work What is the context?

At the time marking the tenth Berlin's division, the Wall stood as the most emblematic symbol of Cold War German

reluct of political and ideological conflict. Its material chara cation-were dictated by political decisions, which granted the Wall a sense of p

This context encouraged a perspective that went beyond seeing the Wall as a mere

from the Wall's physical characteristics to its broader spatial and soc

Year: Spring 2025 Instructor: Bernard Tschumi Course: The Contemporary (Ideas and Concepts from 1968 to the Present): "SCHOOLS?" Title: Contextualizing a Concept: The Solid / Void Concept from Y2K House to Casa da Música





The void persists; the solid transforms



Year: Spring 2025 Instructor: Amale Andraos Course: The Arab City Title: From Casbah to Viaduct: Le Corbusier's Visual Analysis and the Abstraction of Algiers







What mattered was not context, history, or culture—but the framing of a spectacle: a picturesque city enjoyed through the gaze