1 Supplementary Material

1.1 Additional success examples from the Pipeline

Reference (image + prompt)	**Baseline**	**Pipeline**
		
Prompt: Wide-angle view of a bag positioned on a moss-covered fallen log in a dense forest clearing surrounded by towering pine trees and scattered wildflowers, soft diffused natural light filtering through the canopy above.		
		
Prompt: Low-angle perspective of a drinking cup sitting on sandy beach dunes with ocean waves and seashells visible in the distance, golden hour sunlight casting long dramatic shadows across the scene.		
		
Prompt: Medium shot of a table positioned in a sleek modern office space with glass walls, minimalist decor, and polished marble floors, illuminated by clean white fluorescent lighting and natural daylight, professional photo		

Figure 1: Additional success cases where pipeline improves generated image output quality for ICLight. Left: reference. Middle/Right: generated images from baseline and pipeline

Reference (image + prompt)	Baseline	Pipeline
		
Prompt: Close-up shot of a broom leaning against white kitchen cabinets in a modern home interior, ceramic tiles reflecting soft morning sunlight streaming through nearby windows, photo		
		
Prompt: Medium shot of a chair sitting on pristine white sand at a tropical beach with crystal clear turquoise water, swaying palm trees in the background, and bright midday sunlight creating sharp contrasts and vibrant colors in this paradisiacal coastal scene.		
		
Prompt: Close-up shot of a hat resting on weathered cobblestones in a bustling city street with vintage brick buildings and iron lampposts in the background, warm golden hour sunlight casting long shadows across the urban scene, professional street photography style		
		
Prompt: Medium shot of a microphone positioned on a wooden desk in a cozy home office setup with bookshelves, houseplants, and a laptop computer nearby, soft natural daylight streaming through a nearby window creating gentle shadows and a warm, inviting atmosphere for podcasting.		

Figure 2: Additional success cases where pipeline improves generated image output quality for Nova Canvas. Left: reference. Middle/Right: generated images from baseline and pipeline

Figure 3: Additional success cases where pipeline improves generated image output quality for Replace Anything. Left: reference. Middle/Right: generated images from baseline and pipeline

1.2 Failure Cases

Figure 4 illustrates Replace Anything's tendency to hallucinate spurious objects, likely from over-compensation for prompt alignment and scene integration. Figures 5 and 6 show cases where the reference object is ignored—a common failure in outpainting/harmonization models that we did not observe with Nova Canvas in our experiments. Figures 7a, 7b, and 8 depict failures caused by misalignment between the ABO category label and the product image; because our captions use the label as the product reference, this mismatch creates ambiguity. The models outcome in this case is unpredictable. Outpainting models (Nova Canvas, Replace Anything) often retain the reference image while also inserting a category-consistent instance or, as in the cup example, produce a semantic compromise. ICLight-being fine-tuned for harmonization—frequently discards the reference entirely. Finally, Figure 9 shows an ICLight-specific failure in which objects are recolored to match the scene's palette.

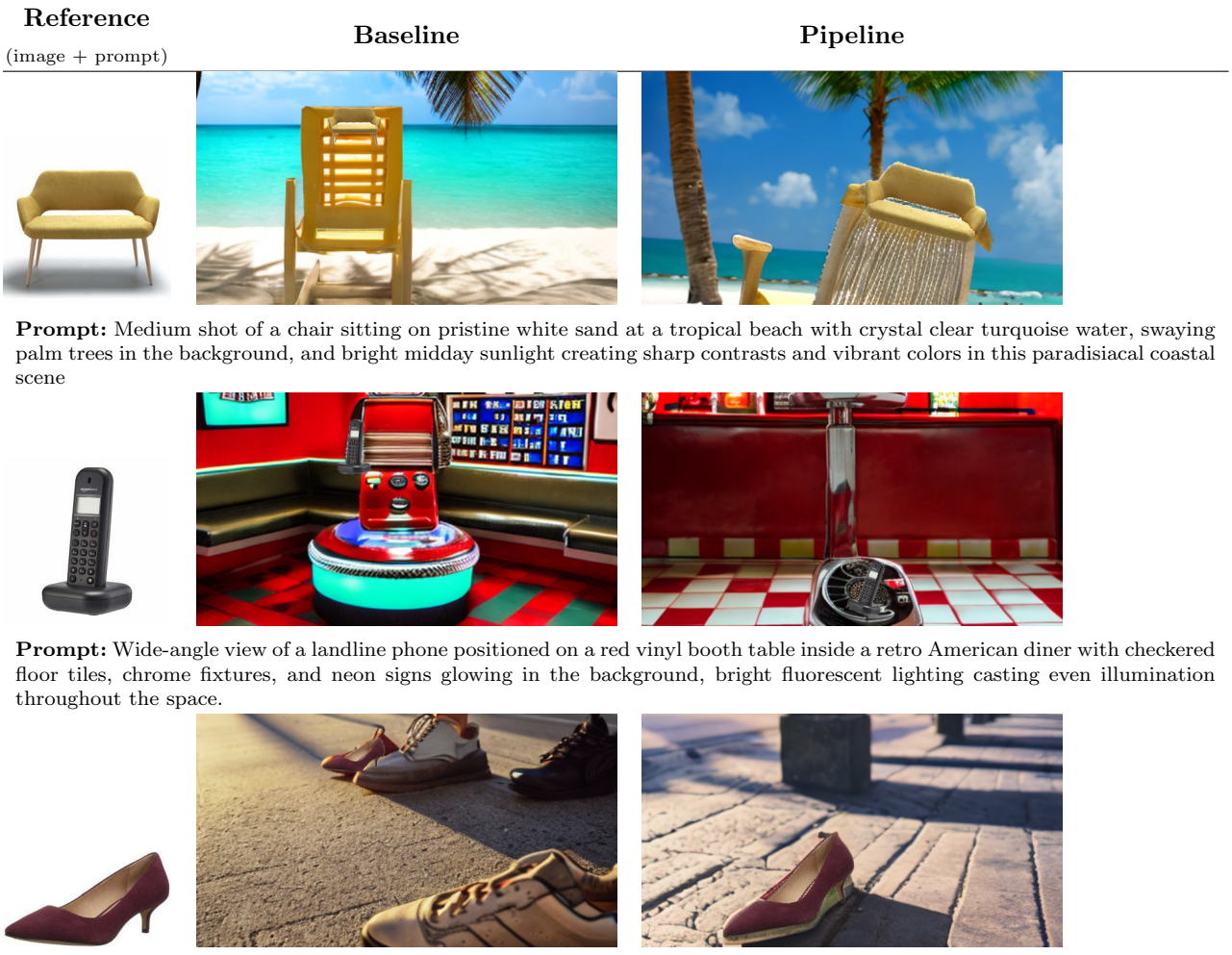


Figure 4: Failure cases for Replace Anything - hallucination. Left: reference. Middle/Right: generated images from baseline and pipeline

Reference (image + prompt)	Baseline	Pipeline
		

Prompt: Low-angle perspective of a broom resting against weathered brick wall in narrow urban alleyway, dramatic evening light from street lamp casting long shadows across wet pavement, photo

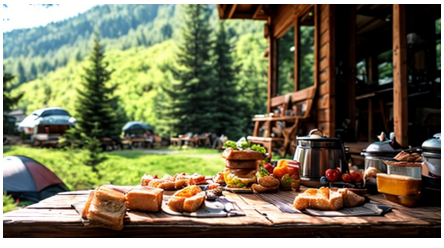
		

Prompt: Low-angle photograph of wine bottle partially buried in white sand dunes with desert landscape and distant mountains visible on the horizon under bright midday sun creating dramatic shadows and harsh contrasts.

Figure 5: Failure cases for Replace Anything - Object Ignored. Left: reference. Middle/Right: generated images from baseline and pipeline. In the above cases the model generated another instance of the object.

Reference (image + prompt)	Baseline	Pipeline
		

Prompt: Close-up shot of a broom leaning against white kitchen cabinets in a modern home interior, ceramic tiles reflecting soft morning sunlight streaming through nearby windows, photo

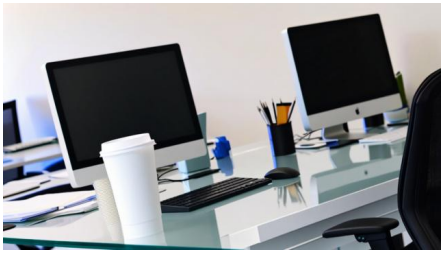
		

Prompt: Wide-angle view of a toaster positioned on a wooden picnic table in a mountain campsite with pine trees and tents visible in the background, bright natural daylight illuminating the outdoor breakfast setup.

Figure 6: Failure cases for ICLight - Object Ignored. Left: reference. Middle/Right: generated images from baseline and pipeline. In the first case the baseline completely ignored the reference image while the pipeline version generated another instance. In the second case, the toaster is floating in the air in the baseline image and is completely ignored in the pipeline generated image.

Reference (image + prompt)	Baseline	Pipeline
		
Prompt: Medium shot of luggage resting on sandy beach with palm trees swaying and turquoise ocean waves in background, bright tropical sunlight creating vibrant colors and gentle shadows on white sand, photo		
		
Prompt: Overhead shot of a drinking cup placed on a rustic wooden table in a cozy cafe setting with pastries and newspapers scattered around, warm ambient lighting from vintage pendant lamps.		

(a) Failure cases for ICLight - Product Mismatch. Left: reference. Middle/Right: generated images from baseline and pipeline. The first example shows a bag labeled as "Luggage" in the ABO dataset. The baseline completely disregards the reference image. In the second row, a stack of cups labeled as "Drinking Cup" confuses the model, leading both the baseline and the pipeline to ignore the provided image reference.

Reference (image + prompt)	Baseline	Pipeline
		
Prompt: Medium shot of luggage resting on sandy beach with palm trees swaying and turquoise ocean waves in background, bright tropical sunlight creating vibrant colors and gentle shadows on white sand, photo		
		
Prompt: Eye-level photograph of a drinking cup positioned on a sleek glass desk in a modern office space with computer monitors and office supplies nearby, bright fluorescent lighting creating clean reflections.		

(b) Failure cases for Nova Canvas - Product Mismatch. Left: reference. Middle/Right: generated images from baseline and pipeline. In the first row, the bag is labeled as "Luggage" in the ABO dataset. The baseline image shows the model generating a generic piece of luggage, reflecting confusion from the label. In the second row, a stack of reusable cups labeled as "Drinking Cup" results in the model generating coffee cups, capturing only a loose semantic resemblance to the reference image.

Reference (image + prompt)	Baseline	Pipeline
		
Prompt: Medium shot of luggage resting on sandy beach with palm trees swaying and turquoise ocean waves in background, bright tropical sunlight creating vibrant colors and gentle shadows on white sand, photo		
		
Prompt: Overhead shot of a drinking cup placed on a rustic wooden table in a cozy cafe setting with pastries and newspapers scattered around, warm ambient lighting from vintage pendant lamps.		

Figure 8: Failure cases for Replace Anything - Product Mismatch. Left: reference. Middle/Right: generated images from baseline and pipeline. In the first row, label confusion causes both methods to generate additional luggage around the reference image. In the second row, while the stack of cups is preserved in the baseline, the model inserts an extra cup on the table, and the pipeline produces a paper cup instead..

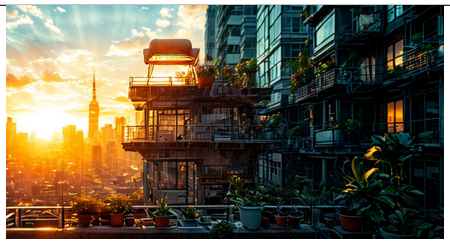
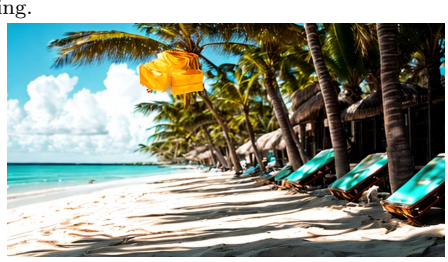
Reference (image + prompt)	**Baseline**	**Pipeline**
		
Prompt: Bird's eye view of a chair placed on a concrete urban rooftop terrace overlooking a bustling cityscape with skyscrapers, busy streets below, and potted plants around the edges, illuminated by dramatic sunset lighting casting long shadows across the industrial setting.		
		
Prompt: Medium shot of luggage resting on sandy beach with palm trees swaying and turquoise ocean waves in background, bright tropical sunlight creating vibrant colors and gentle shadows on white sand, photo		
		
Prompt: Overhead shot of shoes placed on polished white marble floor in a minimalist modern interior with clean geometric lines, sleek furniture, and bright even lighting from recessed ceiling fixtures, photo		

Figure 9: Failure cases for ICLight - Color Change. Left: reference. Middle/Right: generated images from baseline and pipeline.