Guided Co-Modulated GAN for 360° Field of View Extrapolation

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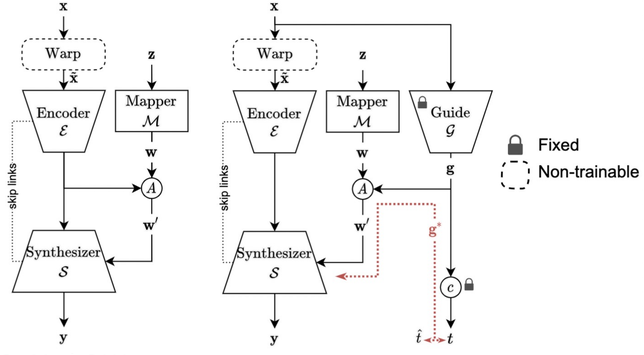
Motivation

- What a narrow field of view image tells us about the 360° environment surrounding the camera?
- Can we change the predicted 360° environment without changing the input narrow field of view image?

Approach

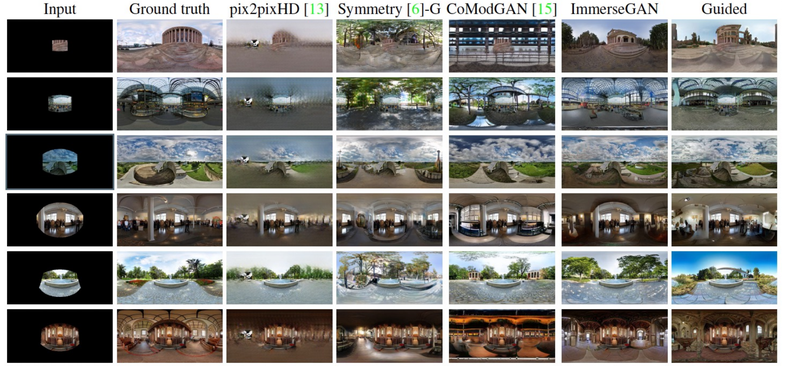
- 360° FOV extrapolation: Co-Mod-GAN [Zhang et al.] architecture with three modifications
  - 2x1 architecture
  - FOV masks
  - Seamless panorama generation with no visible boundaries: horizontal shift with a wrap around

- Editability: guided co-modulation
  - Using a pre-trained scene classifier as the guide for the co-modulation process



Results

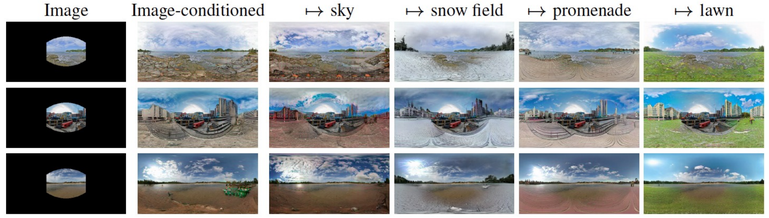
- FOV extrapolation: qualitative



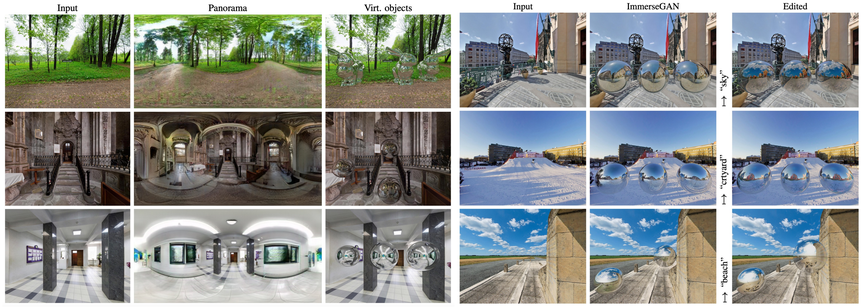
- FOV extrapolation: quantitative using FID

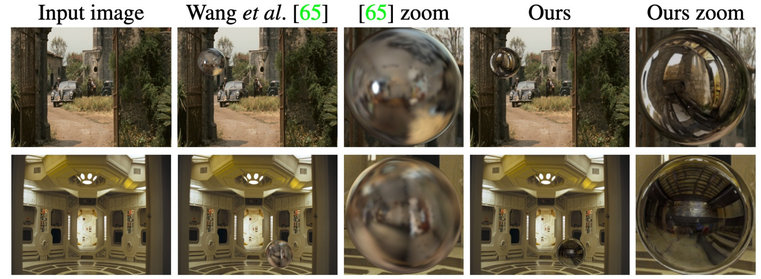
Method	40°	60°	90°	120°	Mixed
pix2pixHD [13]	226.41	163.19	100.18	58.09	122.18
Symmetry [6]-R	106.89	79.86	64.91	62.24	62.28
Symmetry [6]-G	92.97	75.66	61.60	62.15	56.04
CoModGAN [15]	79.05	67.72	46.33	35.34	47.91
ImmerseGAN (ours)	37.90	35.55	32.25	28.92	32.48
Guided ImmerseGAN (ours)	37.15	34.65	32.41	32.97	35.01

- Editing



Application: virtual object compositing





Conclusion

- GAN-based 360° FOV extrapolation
- State-of-the-art both quantitatively and qualitatively
- Novel guided mechanism for editing
- For more information: https://lvsn.github.io/ImmerseGAN/