NeRF Analogies: Example-Based Visual Attribute Transfer for NeRFs

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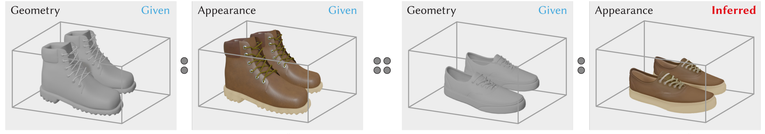
project page, code & 3D results

Motivation

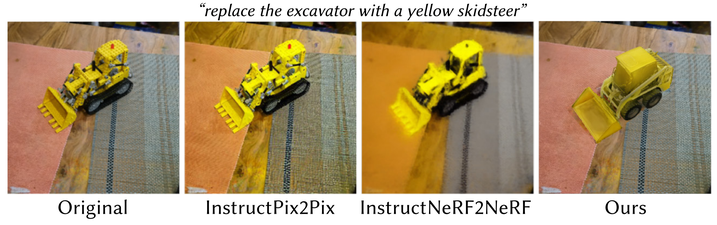
- NeRF models geometry + appearance
- Task: combine source appearance with target geometry:

  → appearance transfer in semantically related regions



- The resulting NeRF should satisfy the analogy A:A' :: B:B'

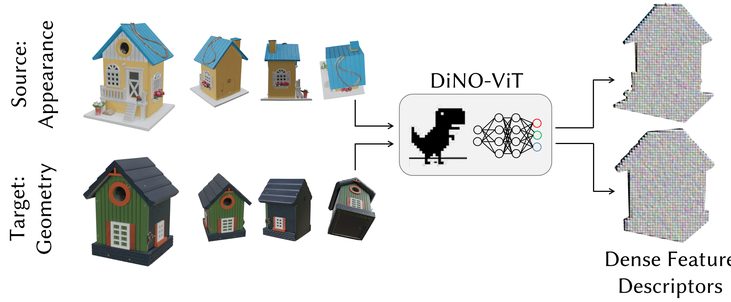
- **Previous work: 2D not MVC, 3D methods...**
  - ... based on text: not expressive enough



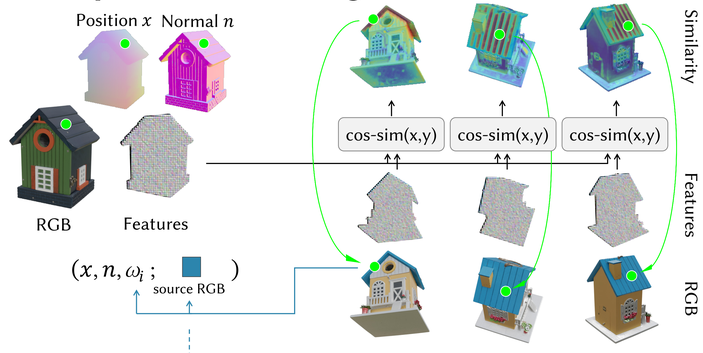
  - ... based on geometry: non-automatic/-robust, discontinuous, fixed topology, ...

Method

1. Feature Extraction

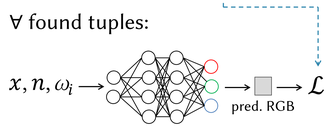


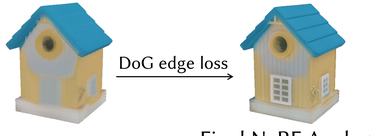
2. Correspondence Matching



3. Training

∀ found tuples:

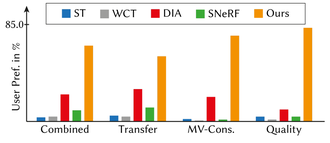




Results

- Our transfer is preferred by humans and metrics

	Metrics			User study			
	BPSNR	BSSIM	CLIP	Transfer	MVC	Quality	Comb.
ST [19]	25.14	.870	.981	1.7%	1.4%	2.9%	1.9%
WCT [34]	28.64	.917	.983	3.4%	0.5%	0.5%	1.9%
DIA [36]	33.06	.968	.983	28.6%	20.5%	9.1%	23.0%
SNeRF [49]	32.41	.947	.984	7.8%	1.0%	2.9%	4.8%
Ours	**36.16**	**.984**	**.992**	**58.5%**	**76.7%**	**84.8%**	**68.4%**



- Limitations & Extensions: