

# Learning High Dynamic Range from Outdoor Panoramas

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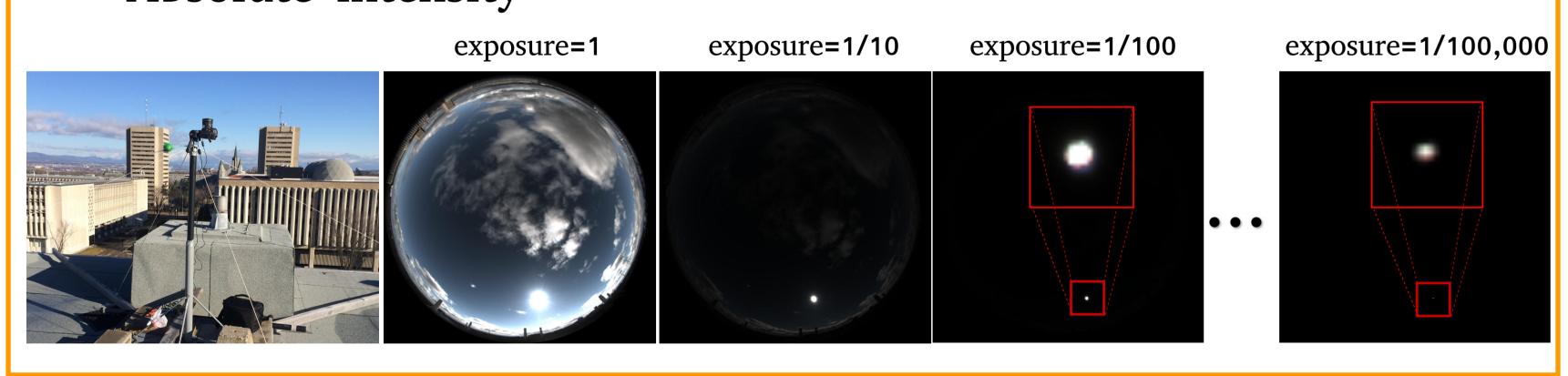


# Motivation Outdoor lighting Low Dynamic Range (LDR) vs. High Dynamic Range (HDR) Render with Outdoor scene LDR lighting Render with our HDR lighting

### Challenge

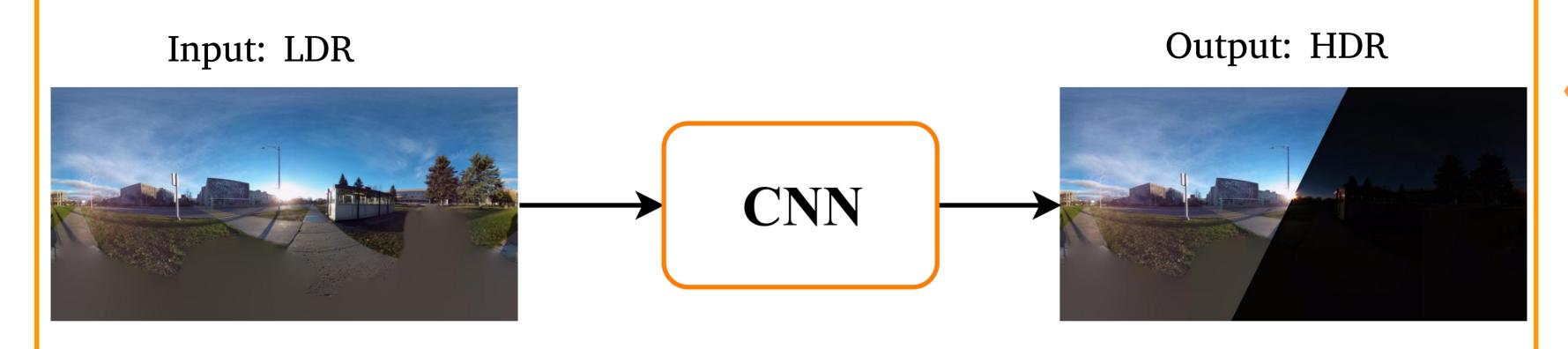
Hard to capture outdoor lighting with conventional cameras.

- Extremely high dynamic range
- Absolute intensity



#### Goal

Directly learn the extremely high dynamic range of outdoor lighting from a single, LDR 360° panorama.



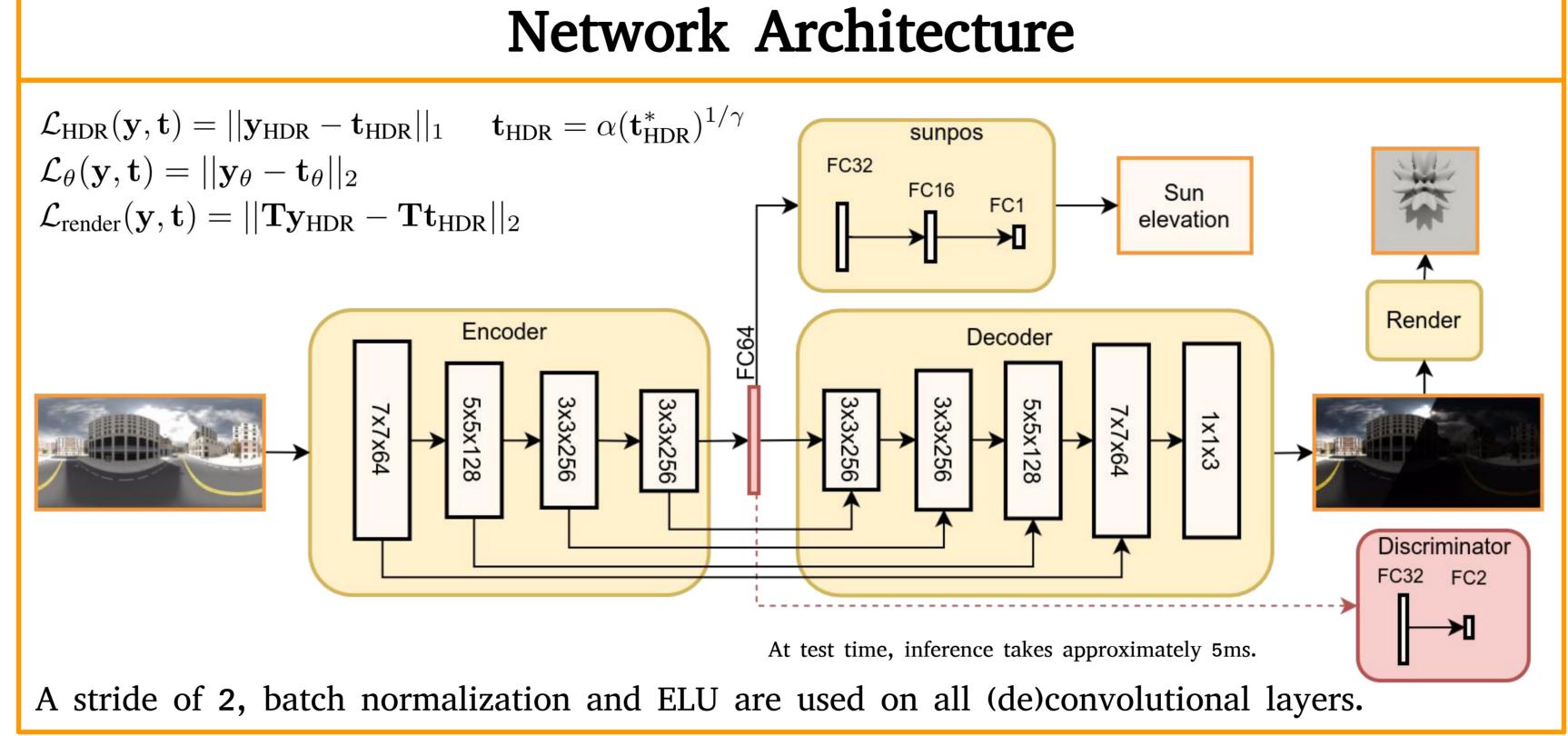
# Project page



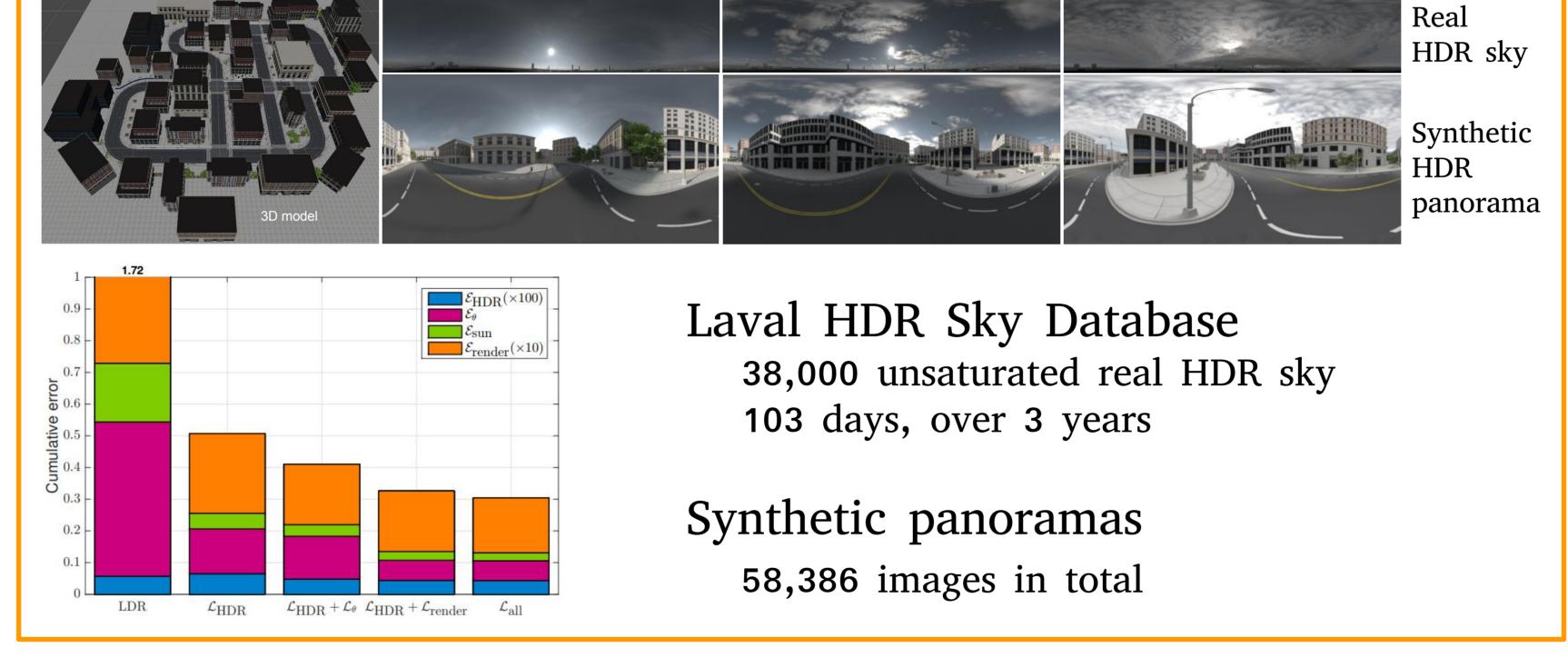
#### Contributions

- Regress HDR instead of capturing it
- Novel LDR/HDR dataset
- Three novel applications

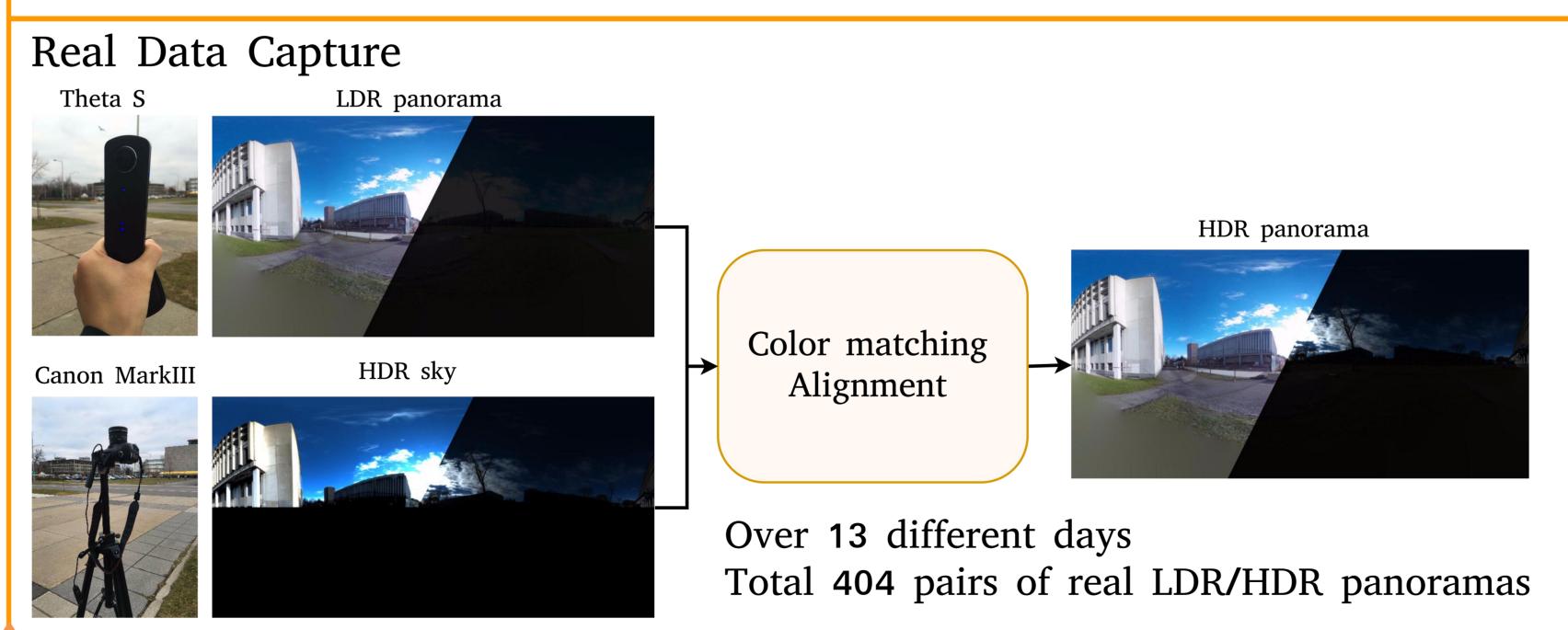
# Approach



# Synthetic Data Generation & Result



## From synthetic to Real



#### Experiments on Real Data



Generalizing the model trained on synthetic data

- Modeling white balance
- Modeling camera response function
- Domain adaptation

Improving the model trained on synthetic data

• Finetuning the model with a small amount of labelled real data.

#### Adapting the input LDR panorama

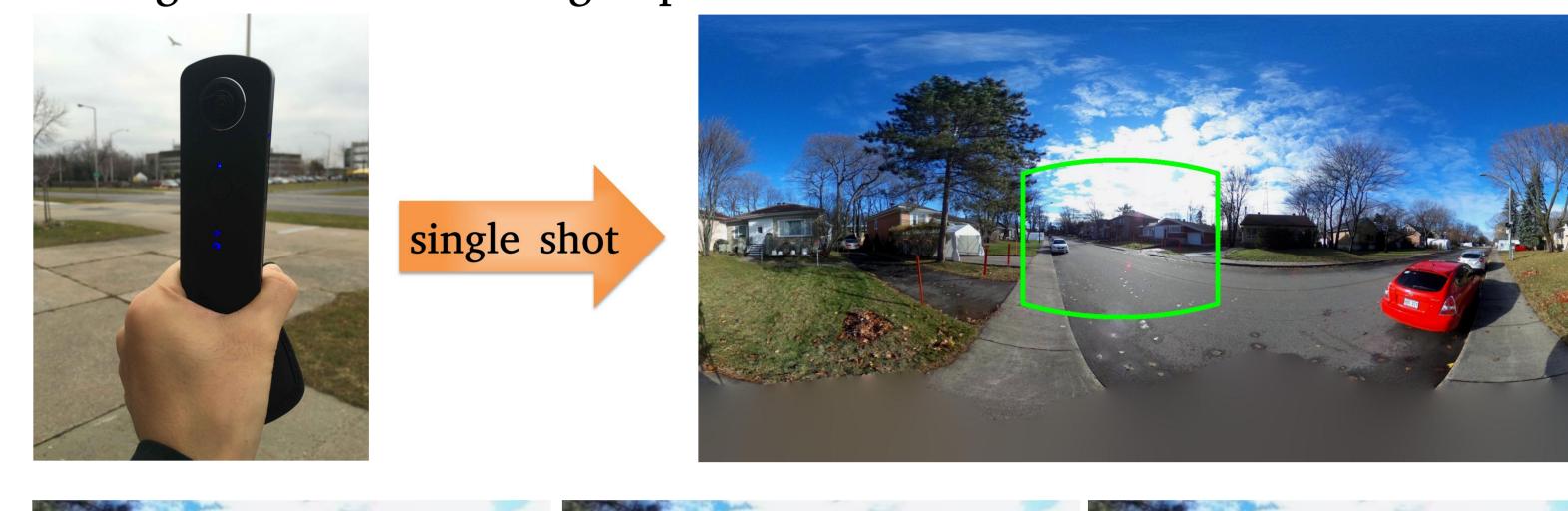
- Applying simple gamma function
- Applying inverse response function
- + white balance transformation

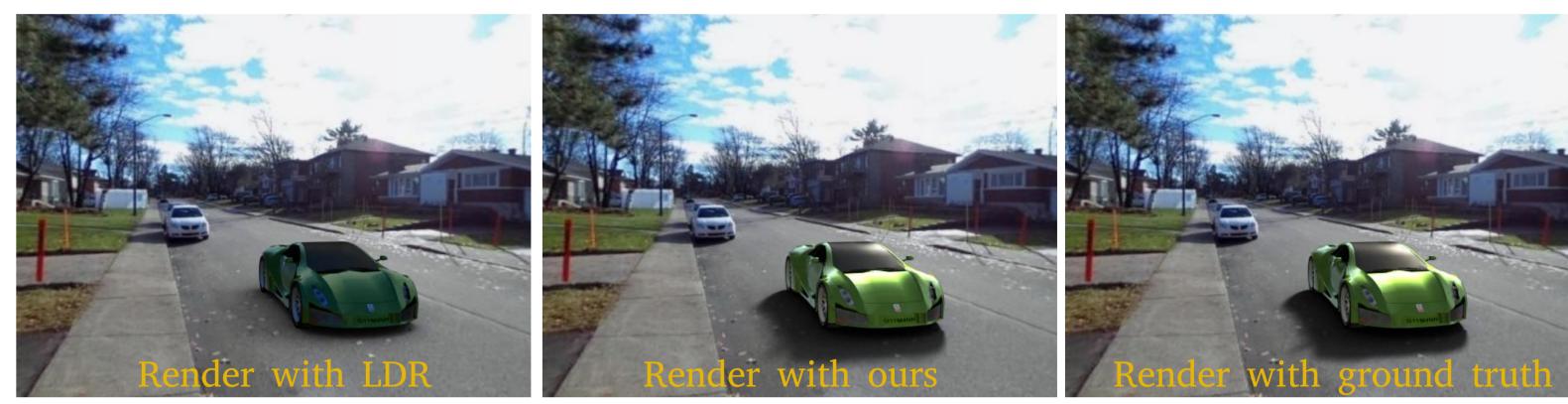
Applying inverse response function

# Results

#### Applications







#### 2. Making Google Street View HDR





#### 3. Image matching

