1. Pano2Vid

360° Camera

Challenge for watching 360° video:
How to find the right direction to watch?

Pano2Vid Definition
Input: 360° video
Output: “natural-looking” normal-field-of-view (NFOV) video
Task: control the virtual camera direction

2. Proposed Solution – AutoCam

Key Idea: Learn videography tendencies from Web videos
- Learn diverse capture-worthy content
- Pickup proper composition

Spatio-Temporal Glimpses
- Short NFOV video extracted from 360° video
- Makes 360° content comparable with NFOV videos
- Fixed camera parameter & direction

Sample ST-glimpses
Sample ST-glimpses and reduce the problem to ST-glimpses selection.

Capture-worthiness score
- Does the ST-glimpse looks human-captured?
- Implement by discriminative classifier

Example ST-glimpses

Human-captured NFOV videos (“HumanCam”)

Construct Virtual Camera Trajectory

- Maximize accumulated score
- Smooth camera motion

Reduce to shortest path problem

4. Evaluation Metrics

HumanCam-based Metrics
Output videos should look like human-captured videos.
- Distinguishability
- HumanCam-likeness
- Transferability

HumanEdit-based Metrics
Virtual camera trajectories should be similar to human-selected ones.
- Cosine similarity
- FOV overlap

5. Experiments

Dataset: videos crawled from YouTube using keywords
“Hiking”, “Mountain climbing”, “Parade”, “Soccer”

<table>
<thead>
<tr>
<th># videos</th>
<th>Total length</th>
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<tbody>
<tr>
<td>360° videos’</td>
<td>86</td>
</tr>
<tr>
<td>HumanCam</td>
<td>9,171</td>
</tr>
<tr>
<td>HumanEdit</td>
<td>20°</td>
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Baselines

Center prior
Random trajectories biased toward center

Eye-level prior
Static trajectories lying on the equator

Saliency
Replace capture-worthiness with saliency score

HumanCam-based Metrics

HumanEdit-based Metrics