A Data Set Providing Synthetic and Real-World Fisheye Video Sequences

Andrea Eichenseer and André Kaup

Multimedia Communications and Signal Processing
Friedrich-Alexander-Universität Erlangen-Nürnberg
Cauerstr. 7, 91058 Erlangen, Germany

Motivation: Fisheye Cameras

- Ultrawide field of view (FOV) surpassing 180°
- Applications: Video surveillance, automotive, outdoor, virtual reality, medicine, ...
- Different image characteristics require adaptations of conventional signal processing techniques
- Suitable test material needed
- No publically and freely available fisheye data set available so far

Availability of Data Set

- All sequences available in 8-bit RGB format (PNG)
- Raw data available in 12-bit Bayer GR format (TIFF)
- Successfully used for adapted motion estimation, error concealment, and super-resolution algorithms
- Freely available for research purposes
- Publically available online: www.lms.lnt.de/fisheyedataset

Synthetic Fisheye Video Sequences

- Rendered in Blender from 3D scenes using the equisolid angle fisheye model
  - Projection function is known
  - Enables perfect re-mapping, e.g., distortion correction
  - Useful for verification purposes
- Various types of content
  - Simple patterns & text
  - Images used as textures on cubes
  - Real-world scenes including automotive and surveillance scenarios
- Different types of camera and scene motion
  - Global motion (G), local motion (L)
  - Translation (T), pan (P), rotation (R), zoom (Z)
- Properties
  - Resolution: 1088 x 1088 pixels, FOV: 185°
  - Focal length: 1.8 mm, Sensor: 5.2 mm x 5.2 mm

Real-World Fisheye Video Sequences

- Captured with a fisheye camera
  - Camera: Basler acA2000-50gc
  - Lens: Fujinon FE185C057HA-1
- Different types of camera and scene motion
  - Global motion (G), local motion (L)
  - Translation (T), pan (P), zoom (Z)
  - Including shaky camera motion for use with super-resolution applications, for example
- Properties
  - Resolution: 1150 x 1086 pixels, FOV: 185°
  - Focal length: 1.8 mm, Sensor: 2/3"
  - Hundreds of frames available per sequence
  - Sensor data available, e.g., for demosaicking

- Various types of content, ranging from testcharts over indoor scenes...
- ... to surveillance and automotive sequences