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

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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

Equisolid fisheye image FOV = 185°   Perspective image FOV = 110°
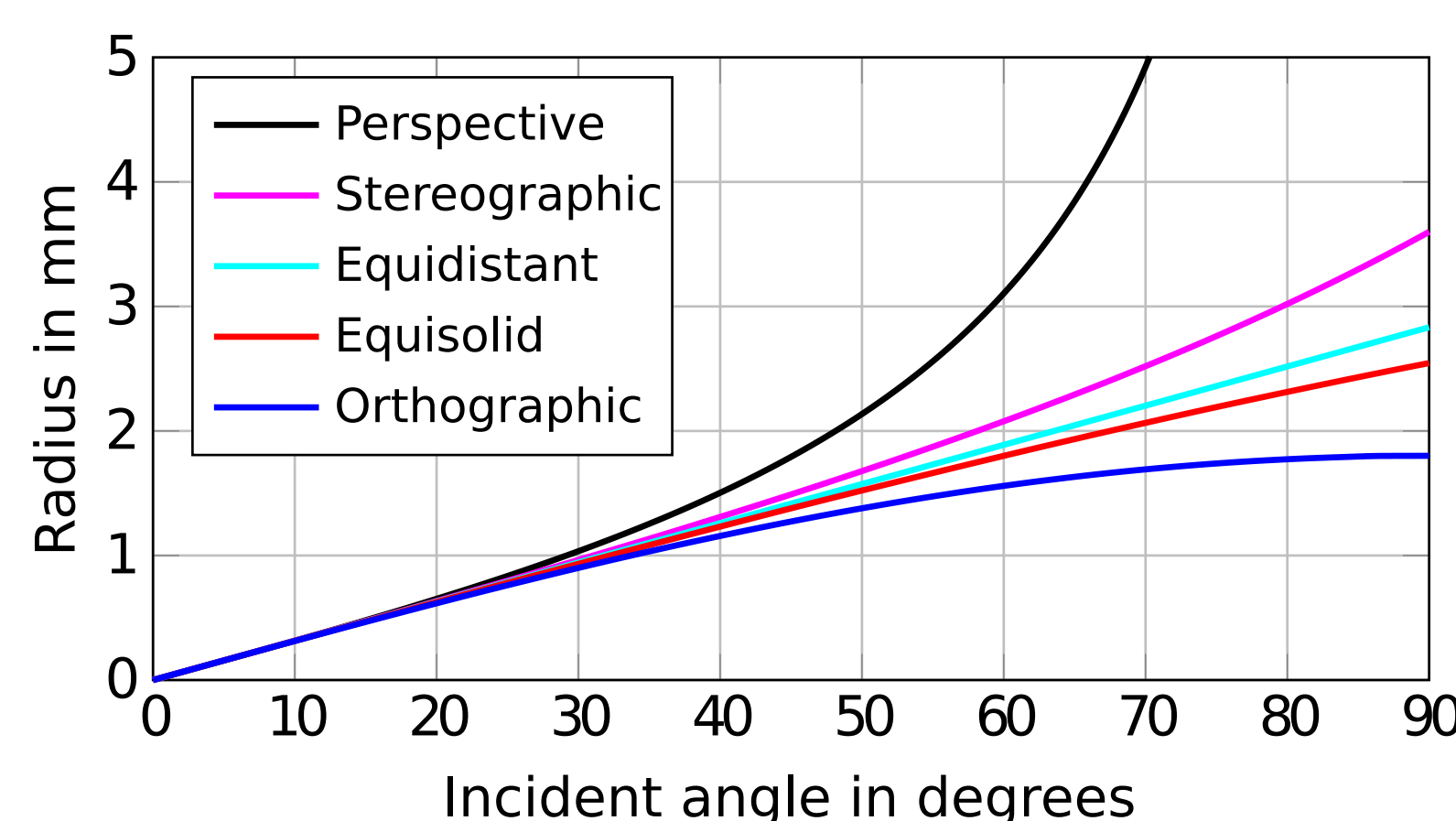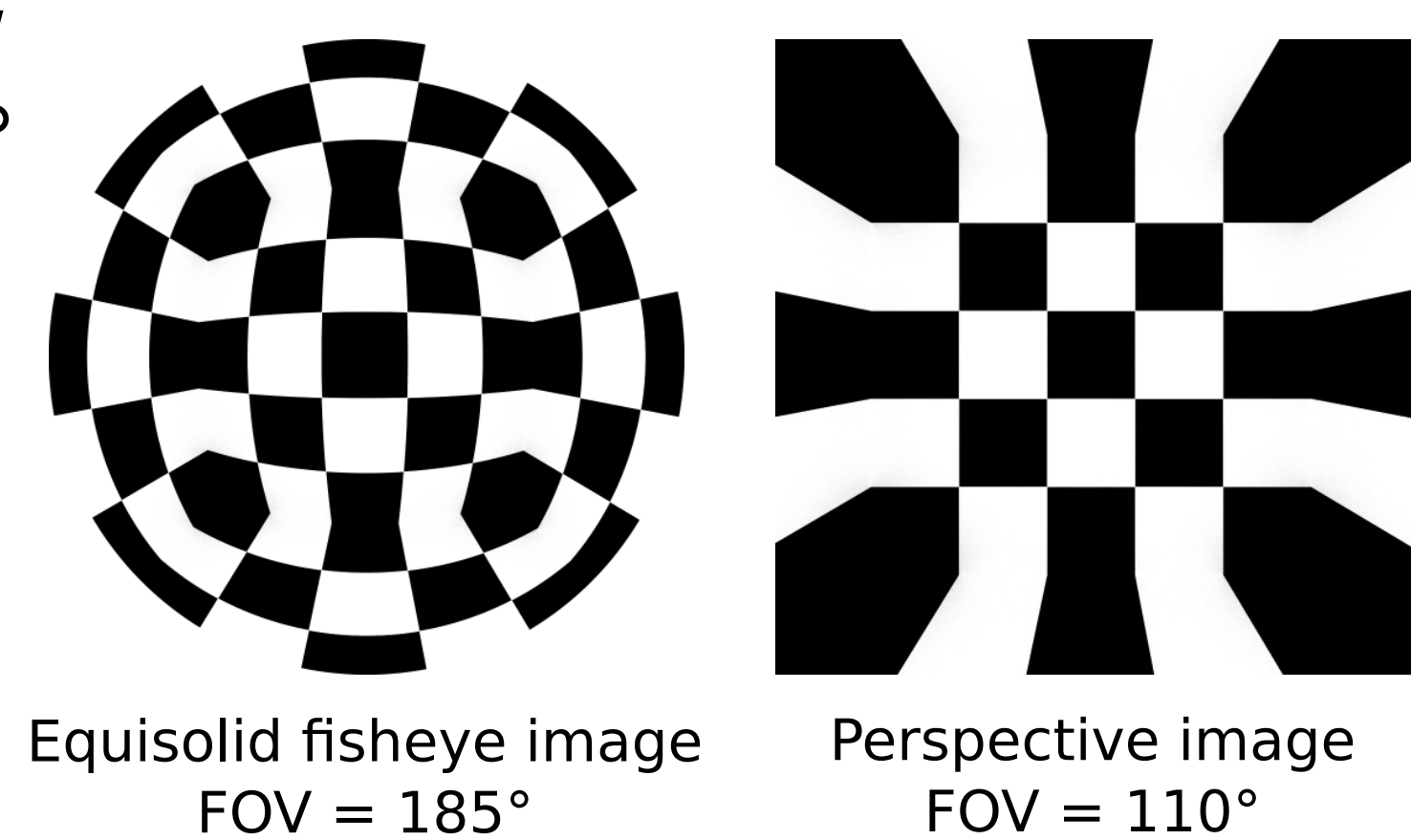
Synthetic Fisheye Video Sequences

- 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
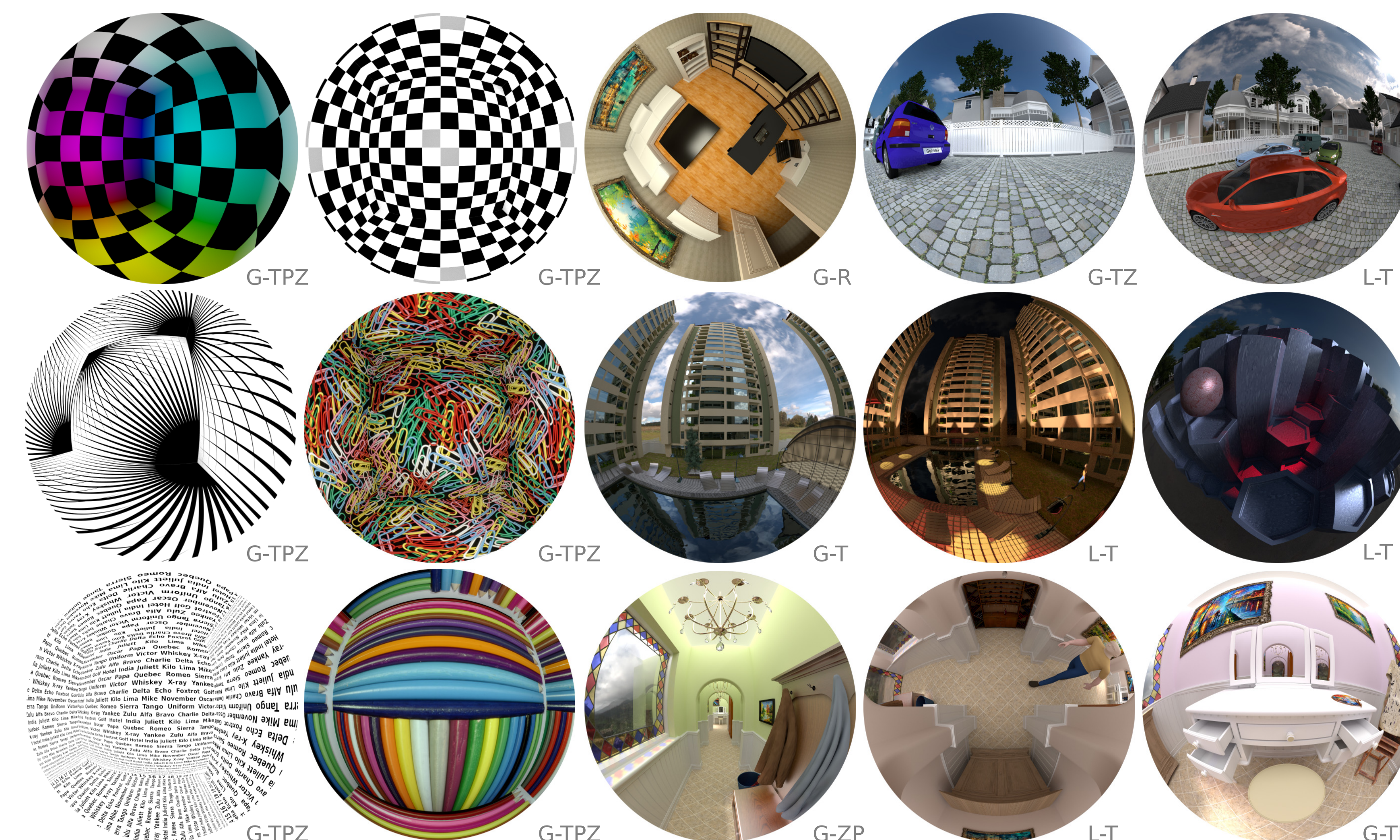

Availability of Data Set

- 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

Real-World Fisheye Video Sequences

- Captured with a fisheye camera
  - Camera: Basler ace 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
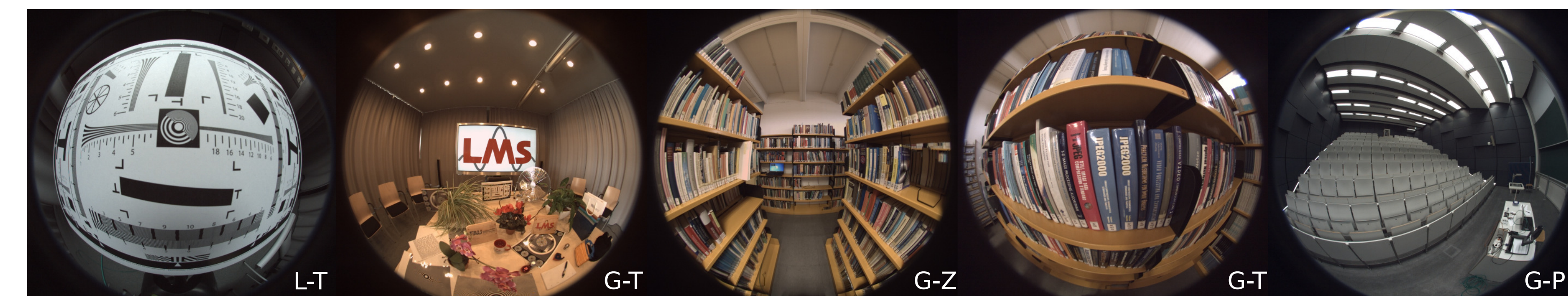
- Various types of content, ranging from testcharts over indoor scenes...

- ... to surveillance and automotive sequences