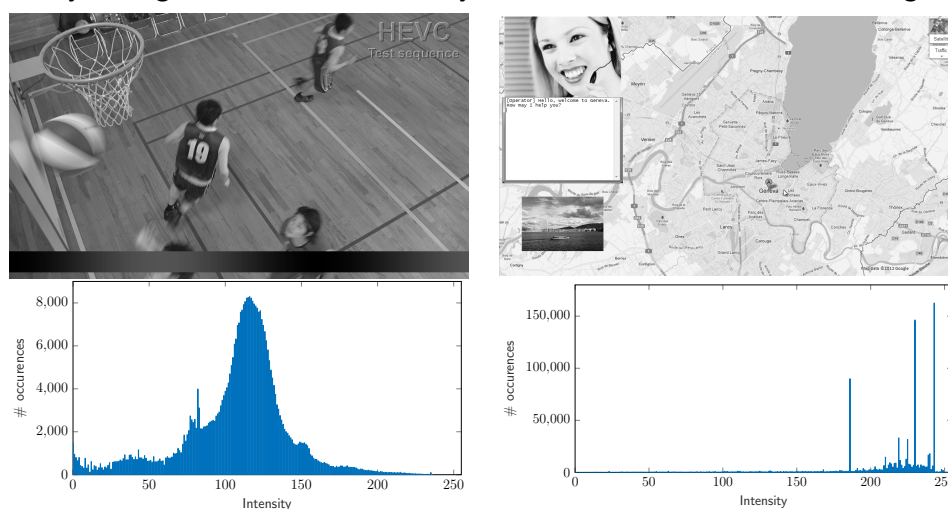


## Possible topics for a bachelor thesis/research internship/minor project

**Topic:** Compression of Screen Content Images

**Description:** Screen content (SC) refers to images as they can be seen on desktop PCs, smartphones or other digital displays. Generally, SC images contain 'synthetic' content, e.g. buttons, diagrams, text or animations. In contrast to camera-captured content, SC is usually characterized by a low number of unique colors, repeating patterns, uniform colored areas and sharp edges. A comparison of intensity histograms for natural and synthetic content can be seen in Figure 1.



**Figure 1:** HEVC-SCC test set image and their intensity histograms

The transmission of such images and image sequences is required for many applications such as screen sharing, cloud gaming or online conferences. However, SC can be a challenge for conventional coding schemes, since they are in general optimized for camera-captured scenes. Thus, a multitude of coding techniques specifically geared towards SC have been proposed, such as palette mode in HEVC or the Soft Context Formation coder by Strutz et al.

In this field of research possible topics for student theses include:

- Deep Learning based screen content compression
- Evaluation and modification of upsampling methods for SC images
- Segmentation-based compression of composite screen content images
- Post-processing methods for reduction of compression artefacts

Prerequisites are knowledge about Image and Video Coding, good programming skills and, depending on the topic, deep learning experience.

**Prerequisites:** Image coding knowledge, programming experience

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**Available:** Immediately