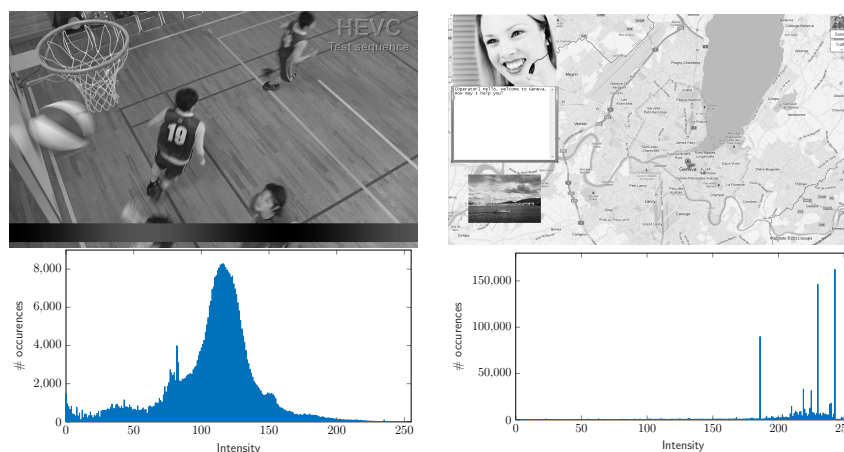


## Possible topics for a bachelor thesis/master thesis/research internship/minor project

**Topic:** Compression of Screen Content

**Description:** Screen content (SC) refers to images as they can be seen on desktop PCs, smartphones or other digital displays. SC is computer-generated and typically consists of 'synthetic' content, e.g. buttons, diagrams, text or animations. In contrast to sensor-generated content, SC is usually characterized by a low number of unique colors, repetitive patterns, uniformly colored areas and sharp contrasts. 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 SC images and videos is necessary 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 sensor-generated data. Thus, a multitude of coding techniques specifically geared towards SC have been proposed, such as palette mode in HEVC or the Soft Context Formation (SCF) coder by Strutz et al.

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

- Adapting deep learning based compression algorithms for screen content
- Extension of the SCF coder from image compression to video compression
- Dictionary-based compression of text areas in the SCF coder

Prerequisites are knowledge about image and video processing, good programming skills in Python/Pytorch for deep learning topics or C/C++ for SCF topics.

**Prerequisites:** Signal processing knowledge, programming experience in Python or C/C++

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**Available:** Immediately