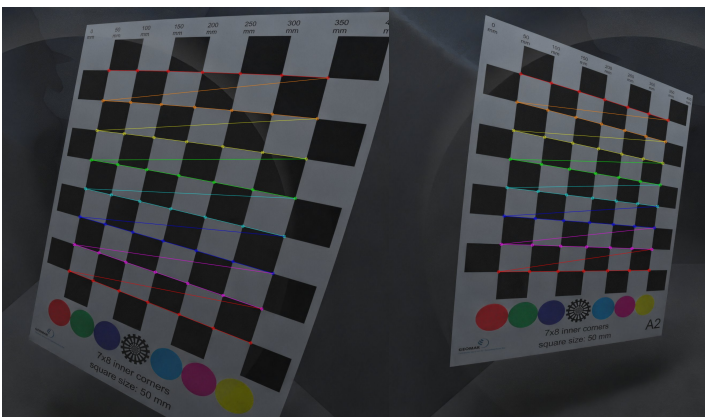
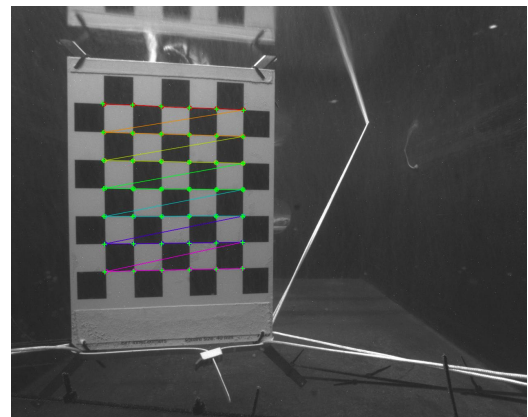


The Oceanic Machine Vision Group at the GEOMAR works on the topic of optical underwater surveys employing artificial intelligence (AI) and classical computer vision approaches and offers the following opportunity for a

– Master Thesis –  
**Robust Underwater Checkerboard Detection**



Checkerboard-Detection on Synthetic Data



Checkerboard-Detection on Real Image

Deep sea imagery suffers from wavelength-dependent attenuation in the water column and refraction at the air/glass/water interface of pressure housings. Thus, the images have false colors and incorrect geometries, which render them unsuitable for state-of-the-art computer-vision and photogrammetry applications. A possible remedy is the prior in-situ calibration of the camera-light systems. To this end, a calibration object with known colors and dimensions has to be detected in images to be used as a basis to identify scene parameters. Unfortunately, the underwater detection of such calibration objects — like checkerboards — is not very robust. Thus, a possible work plan for this thesis would consist of the identification of robust in air calibration object detection systems and a subsequent adoption to the underwater-case, followed by an evaluation on synthetic as well as real underwater imagery.

Prerequisites: Python and/or, C++, ideally interested in computer vision

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