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Title: Extreme Optical Imaging for Underwater Robotic Vision

Absorption, scattering, and color distortion are three major issues in underwater optical imaging. Light rays traveling through water are scattered and absorbed based on their wavelength. Scattering is caused by large suspended particles that degrade optical images captured underwater. Color distortion occurs due to different wavelengths are attenuated to different degrees in water. Consequently, images of ambient underwater environment are dominated by a bluish tone. This talk will introduce some underwater imaging models that compensates the attenuation discrepancy along to the propagation path, a corresponding robust color line-based background light estimator and a locally adaptive filtering algorithm for enhancing underwater images.