# UNDERWATER INTENSITY-TO-HEIGHT DOMAIN TRANSLATION FOR SYNTHETIC APERTURE SONAR

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In remotely sensed synthetic aperture sonar surveys, the same location on the seafloor is often captured from multiple views. However, fusion and alignment of these different views is extremely challenging. For example, error in the coordinates from the INS can be on the order of several meters.  Furthermore, properties of SAS imagery can also provide barriers to adequate co-registration. Sound returns are inherently aspect dependent. In this work, we explore the use of domain translation to improve multi-look SAS image alignment. Three types of models are applied to translate SAS intensity imagery to height estimates: a Gaussian Markov Random Field approach (GMRF), a conditional Generative Adversarial Network (cGAN), and UNet architectures. Methods are compared in reference to coregistered simulated datasets.

**PRESENTER BIO:** Alina Zare teaches and conducts research in the area of artificial intelligence and machine learning as a Professor in the Electrical and Computer Engineering Department at UF. Dr. Zare's research focuses on developing machine learning algorithms to autonomously understand sensor data. Her research has included plant root phenotyping, sub-pixel hyperspectral image analysis, and underwater scene understanding using synthetic aperture sonar.