

IAF EARTH OBSERVATION SYMPOSIUM (B1)  
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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AUTOMATIC SHIP DETECTION FROM HIGH RESOLUTION SATELLITE IMAGES BASED ON A  
DEEP CONVOLUTIONAL NEURAL NETWORK (DCNN) MODEL

**Abstract**

Ship detection and monitoring has been playing a vital role in managing marine traffic and activities that might have a security or civilian importance. For instance, it promotes the maritime rescue, port management and cargo transportation. Furthermore, ship detection enables governments to encounter piracy and illegal fishing. Although remote sensing has been introduced for a long time ago as an alternative to the traditional ship detection methods that requires manual observation and consumes manpower and resources, it is still full of challenges. These challenges are due to the existence of complex backgrounds in the satellite images such as clouds and fog as well as various ships structures with different poses, shapes and scales. More and more attention has been paid to the artificial intelligence technologies to efficiently detect objects based on remote sensing images. The aim of this paper is to design, implement and experimentally assess a novel Deep Convolutional Neural Network (DCNN) based framework for detecting ships from high resolution satellite images. The dataset used in this study consists of 4000 RGB sample images collected over the Dubai Coastline of the United Arab Emirates (UAE). The experimental results revealed that all ships are accurately detected with bounding boxes using sliding window detection mechanism.