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Title: ED31A-02 A 3D Citizen Science Video Game for NeMO-Net, the NASA Neural Multi-Modal Observation and Training Network for Global Coral Reef Assessment

Abstract:

NeMO-Net, the NASA neural multi-modal observation and training network for global coral reef assessment, is an open-source deep convolutional neural network aimed at accurately assessing the present and past dynamics of coral reef ecosystems through determination of percent living cover and morphology. We present here the active learning component of the project, which consists of an interactive video game prototype for tablet and mobile devices where players are able to intuitively label morphology classifications over mm-scale 3D coral reef imagery. Active learning applications present a novel methodology for engaging the public while efficiently providing large-scale training and test data for increasingly complex and data-intensive machine learning algorithms. NeMO-Net trains players on domain-specific knowledge through interactive tutorials and periodically checks players' input against pre-classified coral imagery to gauge their accuracy and utilize in-game mechanics to provide personalized classification training. Players can rate the classifications of other players, unlock rewards and join a global community as they explore and classify coral reefs and other shallow marine environments.

Key Words: Citizen, Science, Video Game, NeMO-Net