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10 - 14 December 2018
Washington, DC

Oral Presentation
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Title: IN13C-0681 GEONEX: Progressive Conditional Generative Adversarial Training Using Transfer learning

Abstract:
Obtaining accurate segmentation on large scale images is an open problem in deep learning. The main problem is the amount of labeled data that exists for large scale images. Traditionally, the common solution to this problem is to crop the large images into smaller images to increase the amount of available data and train a Conditional Generative Adversarial Network (CGAN). CGANs are currently the state of the art in image to image translation and provide better accuracy than the traditional method of training a encoder based conv-net architecture to minimize the loss at each pixel. This method can produce noisy and discontinuous images with inaccurate results. We seek to solve this problem by utilizing the concepts of transfer learning and progressive training to create a CGAN that can segment large scale images with a limited amount of labeled data. In transfer learning we recognize that many learned features are applicable to many classes from multiple domains. This introduces the concept of feature reusability, which is the basis for finetuning. Progressive training got its start in training models on the same images at different resolutions. In this work we instead train a GAN on increasing image scales by transferring the weights from the smaller scales to the larger scales. The learned features at the smaller scales are continually reused and applied to larger scales to create a CGAN that can perform accurate segmentation on large scale images. We apply this method to detect building footprints on very high-resolution overhead imagery (e.g Digital Globe and high resolution airborne platforms).

Key Words: GEONEX, Progressive, Conditional, Generative, Adversarial, Training, Transfer, Learning

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IN13C-0681: GEONEX: Progressive Conditional Generative Adversarial Training Using Transfer learning

Monday, 10 December 2018
13:40 - 18:00
Walter E Washington Convention Center - Hall A-C (Poster Hall)

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