

# Structured Prediction Research

Data Science Professor Jeremiah Johnson presents research

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DR. JEREMIAH JOHNSON, LEFT, WORKS WITH STUDENTS IN HIS INTRODUCTION TO ANALYTICS AND DATA SCIENCE COURSE.

[Jeremiah Johnson](#), assistant professor of data science, presented a paper titled "Structured Prediction Using cGANs with Fusion Discriminator" at the 2019 International Conference for Learning Representations (ICLR) in New Orleans.

Johnson collaborated with colleagues from Johns Hopkins University on the research, which they presented at the Workshop on Deep Generative Models for Structured Prediction at ICLR, the preeminent international conference for research on learning representations, a subfield of machine learning and artificial intelligence.

The research has applications in computer vision, and the group are also working on a related project to use structured prediction to improve the classification of skin lesions.

An alumnus of the University of New Hampshire, Johnson leads the [Analytics and Data Science](#) bachelor's degree program at UNH Manchester.

Dr. Johnson is an alumnus of the University of New Hampshire, earning his Ph.D in mathematics in 2010.

An abstract of the paper is below, and you can [read the full paper here](#).

We propose the fusion discriminator, a single unified framework for incorporating conditional information into a generative adversarial network (GAN) for a variety of distinct structured prediction tasks, including image synthesis, semantic segmentation, and depth estimation. Much like commonly used convolutional neural network - conditional Markov random field (CNN-CRF) models, the proposed method is able to enforce higher-order consistency in the model, but without being limited to a very specific class of potentials. The method is conceptually simple and flexible, and our experimental results demonstrate improvement on several diverse structured prediction tasks.

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