THE UNIVERSITY of MISSISSIPPI

Department of Mathematics

AMS Talk

Error analysis of generative adversarial network

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I will present error estimation on the generative adversarial network (GAN) which is the minimax problem of two neural networks developed by Ian Goodfellow who was a research scientist and director of Google Brain and AI, at Apple. Most of the research on GAN was on application based where the generalized method needs to be understood for its error bound and convergence rate ability. The estimation of the error helps in the analysis of more realistic data. The error bound is developed and explained by a class of functions combined with the neural network structure of the discriminator and generator class. The new class of functions is uniformly bounded, VC type concerning an envelope and VC dimension that helps to get a Talagarnd Inequality. We found a tight convergence rate for the error of GAN after applying Talagrand inequality and Borel Cantelli lemma. The error bound and convergence rate was generalized for the existing error estimation of GAN and we obtain a better convergence rate.