

Short Course of the 2024 Workshop on Biostatistics and Bioinformatics

Title: Tutorial on Deep Learning and Generative AI

Room 1441, 25 Park Place, Georgia State University, Atlanta, GA 30303

1:30pm-5:30pm, May 03, 2024

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Abstract:

Designed specifically for individuals possessing a strong foundation in statistics and biostatistics, this course seeks to bridge the gap into the realm of deep learning and generative AI. Beginning with fundamental knowledge of deep learning, participants will be guided through hands-on implementations using the PyTorch framework. As we delve deeper, the course will unpack popular architectures that have reshaped the landscape of artificial intelligence, including CNN, GNN, ResNet, U-net, attention mechanisms, and transformers. Given the increasing importance of AI in healthcare, special emphasis will be laid on techniques tailor-made for medical imagery and drug discovery, such as SE(3) equivariant machine learning. As a culmination, participants will be introduced to the various facets of generative AI, encompassing GANs, VAEs, DDPM, and score-based generative models. Whether you're seeking to apply these technologies in healthcare, research, or any other domain, this tutorial promises a comprehensive insight into the world of generative AI and deep learning.

About the instructor:



Dr. Haoda Fu is an Associate Vice President and an Enterprise Lead for Machine Learning, Artificial Intelligence, and Digital Connected Care from Eli Lilly and Company. Dr. Haoda Fu is a Fellow of ASA (American Statistical Association), and IMS Fellow (Institute of Mathematical Statistics). He is also an adjunct professor of biostatistics department, Univ. of North Carolina Chapel Hill and Indiana university School of Medicine. Dr. Fu received his Ph.D. in statistics from University of Wisconsin - Madison in 2007 and joined Lilly after that. Since he joined Lilly, he is very active in statistics and data science methodology research. He has more than 100 publications in the areas, such as Bayesian adaptive design, survival analysis, recurrent event modeling, personalized medicine, indirect and mixed treatment comparison, joint modeling, Bayesian decision making, and rare events analysis. In recent years, his research area focuses on machine learning and artificial intelligence. His research has been published in various top journals including JASA, JRSS, Biometrika, Biometrics, ACM, IEEE, JAMA, Annals of Internal Medicine etc.. He has been teaching topics of machine learning and AI in large industry conferences including teaching this topic in FDA workshop. He was board of directors for statistics organizations and program chairs, committee chairs such as ICSA, ENAR, and ASA Biopharm session. He is a COPSS Snedecor Awards committee member from 2022-2026, and will also serve as an associate editor for JASA theory and method from 2023.