

BIOINF 593/EECS 598: Machine Learning in Computational Biology

Fall 2021

Instructors: Jie Liu, Joshua Welch

Tuesdays & Thursdays @ 2:30 pm – 4:00 pm

Computational biology is a rich and growing field featuring large, complex, and noisy datasets. This exciting area both draws upon the techniques of machine learning for scientific discovery and offers challenging problems that push the boundaries of machine learning. We will introduce the foundational machine learning techniques used in computational biology and describe their applications to biological data. Key topics include linear and nonlinear dimension reduction; deep learning for non-Euclidean data types, such as trees, graphs, and manifolds; deep generative models; and other unsupervised learning approaches. The course covers theoretical foundations and practical implementation of the techniques, in addition to the biological background needed for computational biology applications. Expertise in programming, calculus, linear algebra, and probability are required.