Working Group on Statistical Learning Seminar

Title: Generalised exponential kernel for nonparametric density estimation

Speaker: Laura Craig (UCD School of Mathematics and Statistics)

Date: Thu 16th October 2025 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: This work introduces a novel kernel density estimator (KDE) based on the generalised exponential (GE) distribution, designed specifically for positive continuous data. The proposed GE KDE offers a mathematically tractable form that avoids the use of special functions, distinguishing it from the widely used Gamma KDE, which relies on the gamma function. Despite its simpler form, the GE KDE maintains similar flexibility and shape characteristics. The motivation for this new kernel stems from the observation that different asymmetric kernels can lead to varying asymptotic properties for bias and variance, underscoring the importance of exploring alternative forms. Through theoretical analysis and comparative evaluation, this paper demonstrates that the GE KDE provides a competitive and practical alternative to existing asymmetric kernels.