

# Edgeworth approximation to network U-statistics

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**Abstract:** In this talk, we present some limiting theory and numerical results for approximating the distribution of network U-statistics in presence of edge-wise random noise. We compare the results with the classical noiseless setting and discuss their connections and differences. We derive the  $1/\sqrt{n}$  order term in the Edgeworth approximation and show that the accuracy of such approximation achieves order  $1/n$ , ignoring the logarithm factor, under mild conditions. We also discuss the nonparametric bootstrap and compared our method's accuracy with it.