Paris workshop on Bayesian Deep Learning for Cosmology and Time Domain Astrophysics 3rd ed.



ID de Contribution: 8

Type: Talk

Probabilistic inference of galaxy properties using multi-modal variational autoencoders

vendredi 23 mai 2025 09:05 (20 minutes)

Variational autoencoders (VAEs) are powerful tools for inferring object properties, particularly well-suited for processing imaging data due to their architectural design. In this work, we use multi-modal VAEs to generate probability distributions for various galaxy properties using multi-band photometric observations. The VAE is trained on synthetic photometric and spectral datasets to infer properties such as redshift, spectral energy distributions (i.e., low-resolution spectra), and stellar population parameters. These inferences are derived from the latent space representations learned from observational or mock data, which may include either integrated galaxy magnitudes or image cutouts of individual sources. We validate our method using both simulated datasets from LSST and real observations from the Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP), supplemented with spectroscopic data from DESI-DR1.

Authors: ROSSET, Cyrille (APC); ROUCELLE, Cécile (APC); AUBOURG, Eric (APC); GRISHIN, Kirill (Universite de Paris)

Orateur: GRISHIN, Kirill (Universite de Paris)

Classification de Session: Static sky cosmology

Classification de thématique: ML Tools