Cover Letter for EIE4512 Final Project 2023

Part A: Completed by Students

Paper ID	1	Student Name	Lu Yi, Li Junxi	Topic Area	Image Restoration
Title:	Innovative algorithms for the astronomical image restoration				
Abstract（200-300 words）	This project is aimed to restoring astronomical images. In Astrophotography, the object we shoot is a very dim celestial body in the universe, whose light signal may not be much stronger than the noise. At this time, we need to preprocess the deep space image before processing it. Above all, our motivation is that, on the one hand, astronomy images are really critical for astronomy research, so it is necessary for us to derive the high quality images, on the other hand, it is so easy to have noisy or unpleasant images because of various factors. There are many factors that can cause image degradation. The caustics of imaging optical systems, the relative motion between imaging equipment and objects, the inherent defects of imaging equipment, and various external noise interferences can all cause image degradation to varying degrees. Many restoration methods are expected to be used to solve this problem. Classical methods contain inverse filtering, wiener filter, least squares filtering and L-R algorithm. We will also use point spread function of motion blur degradation model and turbulence degradation model as initial point spread function of the blind image restoration method restore image based on mixed degradation mode. Some innovative algorithms may also be introduced by ourselves to get a better result. To lower the time and computation complexity of the algorithm is under our consideration. Source images will be got from some website such as NASA. We will use python to realize some innovative algorithms to process these images. We will use different algorithm to different image to determine which algorithm is suitable to which kind of noise. Finally, we hope our idea can help build more useful algorithms to solve the astronomy image restoration.				

Part B: Completed by Course Staff

Review Comments from TAs	Paper Rating	

(Based on initial paper) Got some concerns. ---------- (Update based on final submission) I like the paper.

TOTAL: _____ Score in details:					
Proposal (20%)	Paper (50%):	Presentation (30%):	Bonus:		
TA-in-charge		Instructor's Signature		Date	Dec. ___ 2022