Korea Astronomy Machine Learning (KAML)

History

- April 2019 - KASI - 1st Meeting
- August 2019 - UoS - 2nd Meeting
  - KAML group is named
- October 2019 - Yonsei - 3rd Meeting
- *December 2020 - "Workshop on Machine Learning in Astrophysics & Astronomy" - Seoul*
  - *Organised by NIMS and UNIST*
- January 2020 - KASI - 4th Meeting
  - Last meeting pre-COVID
- July 2020 - Zoom - 5th Meeting
- October 2020 - Zoom - 6th Meeting
- April 2021 - UoS/Zoom - 7th Meeting
  - Two year anniversary!

Agenda

13:30	Welcome	
13:35 – 14:25	Invited Talk: Min-su Shin	*“Applications of Machine Learning Algorithms and their Challenges in Astronomy”*
14:25 – 15:15	Invited Talk: Ryan Keeley	*“Gaussian Process Regression in Cosmology”*
15:15 – 15:30	Break	
15:30 – 16:15	Discussion 1:	Summary of previous KAML projects
16:15 – 17:00	Discussion 2:	New KAML collaborational projects
17:00	Close	

Project Updates

- Srivatsan Sridhar (from Sungwook)
- Yongseok Jo
- Will Davison
- Sungwook Hong
- Min-Su Shin
- Cris Sabiu
- David Parkinson
- Satadru Bag

Project	People	Status
Period estimation and light curve only classification	Min-Su Shin, Kyungmin Kim	Updated during talk
Galaxy Cluster detection - using photo-z	Srivatsan	Made mock photo-z catalogue suitable for DESI legacy survey, apply SFoF to detect clusters in the mock. Need someone to take over this project, as Srivtasan is busy with new role
Classification of SN & transients - PLAsTiCC - strong lensed objects	Arman, Hanwool, Ben, David, Satadru	Unresolved SN images, working with simulations, training on functional form orthogonal functions regression algorithm
KMTNet photometric reverberation mapping	David, Sangnam, Dongsu, Arman, Will	No current progress, considering recurrent neural network
Simulations – populating halos and generating sky maps	Feng, Sungwook, Ben, Cris, Yongseok Jo, Songyeon, Rory	New machine based on IllustrisTNG, ready to make sky sims (?)
WL reconstruction	James, Sangnam, Dongsu, (Cris), Sungwook	Paper submitted. Next steps yet to been established
Cosmology from CNN	Cris, Hanwool, Arman, Feng, Sungwook, Ben, Srivatsan et al	Simulations run, covid survived, need to be analysed
Cosmology selection from sims with different initial conditions	Benjamin, Arman, David, Cris, Satadru, (Sungwook)	Waiting for hpc time, 2d then 3d cnn training once simulations are run

Project	People	Status
Multi-task learning for star/QSO/galaxy classification and photo-z regression	Min-Su Shin, Joon Goo Lee	Updated during talk
ASKAP-EMU objects – including, AGN, SFGs, radio relics	Jacobo, David, James	No update
Density, velocity from Redshift-space/FoG distortion reconstruction	Feng, Sungwook, Inkyu, Ben	No update
Supernova tagging	Will, David	new tagging software, plus NN classifier testing against OzDES spectra

New Projects Proposed

- SKA Science Data Challenge 2 - proposed by David
- Axion mass detection using 21cm intensity mapping and CNN - in progress by Cris & Kenji
- Hi-res recovery of AMR simulation data from HR5 - proposed by Sungwook