RECOGNITION OF M-TYPE STARS FROM LAMOST DR5 USING A HASH-LEARNING METHOD

Yanxin Guo, A-li Luo, Shuo Zhang, et al. 2019, MNRAS, 485, 2167

Email: lal@nao.cas.cn

1 Key Laboratory of Optical Astronomy, National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China

2 University of Chinese Academy of Sciences, Beijing 100049, China

3 Department of Physics and Astronomy, University of Delaware, Newark, DE 19716, USA

4 Nanjing Institute of Astronomical Optics & Technology, National Astronomical Observatories, Chinese Academy of Sciences, Nanjing 210042, China

WHAT DID WE DO?

LAMOST DR5 low-resolution optical spectra





Distribution of signal-to-noise in g and r band





HOW DID WE DO IT?



Clustering M-type spectra released in DR5 to obtain positive samples





Training Multi-Layer Pseudo Inverse Learning (also called Extreme Learning Machine, ELM) model



Using Hamming distances in Hash space to evaluate similarities





REFERENCE

STAGE 3

Guo P., Wang K., Xin X., 2017, IEEE International Conference on Systems, Man, and Cybernetics (SMC), IEEE, Banff, Canada Luo A.-L. et al., 2015, Research in Astronomy and Astrophysics, 15, 1095 Salakhutdinov R., Hinton G., 2009, International Journal of Approximate Reasoning, 50, 969 Wang K., Guo P., Yin Q., Luo A. L., Xin X., 2016a, International Joint Conference on Neural Networks, IEEE, Vancouver, BC, Canada. p. 3453 Yi Z. et al., 2014, AJ, 147, 33

ACKNOWLEDGEMENTS

This research is supported by the Major State Basic Research Development Program of China (973 Program, No. 2014CB845700), China Scholarship Council, and the National Natural Science Foundation of China (Grant Nos. 11703053 and 11703051). This research has made use of LAMOST data. The Guo Shou Jing Telescope (the Large sky Area Multi-Object fiber Spectroscopic Telescope, LAMOST) is a National Major Scientific Project built by the Chinese Academy of Sciences. Funding for the project has been provided by the National Development and Reform Commission.