Shape Measurement Benchmarking for Weak Lensing Analysis Pipeline

Keywords – Astrophysics - Cosmology - Image Processing

Context

Upcoming astrophysical surveys such as CFIS [1] and Euclid [2] aim to constrain cosmological parameters using properties derived from galaxy images, in particular their shapes via weak gravitational lensing. However, various shape measurement techniques are currently available each with different strengths and weaknesses.

The CosmoStat group is currently developing a weak lensing analysis pipeline in order to process currently available CFIS images. A crucial part of this project will be to benchmark the best possible shape measurement technique and to see what impact this has on the weak lensing analysis.

Outline of project objectives

The internship will essentially be comprised of the following tasks and objectives:

1. Get familiarised with the various galaxy shape measurement techniques currently available.
2. Implement these techniques in the weak lensing pipeline.
3. Interact with other members in CosmoStat to gauge the performance of each technique.

Candidate

The candidate should be a Master 2 (or equivalent) student with background in either physics/astrophysics or applied maths/signal processing/data science. Experience with Python is not required, but would be advantageous.

Internship

The internship will take place in the CosmoStat laboratory, under the supervision of Samuel Farrens and Martin Kilbinger.

- *Deadline for applications:* February 28th, 2019.
- *Contact:* Samuel Farrens (samuel.farrens@cea.fr) and Martin Kilbinger (martin.kilbinger@cea.fr).
- *Duration:* 4-6 months.

[1] http://www.cfht.hawaii.edu/Science/CFIS/
[2] https://www.euclid-ec.org/