

Stage Numero : 120 du 05-11-2012

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- Thème scientifique	Sciences planétaires, exoplanètes
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- Résumé du sujet proposé

Titre : **Programming Development and Porting towards GPGPU In Image Processing For Planetary Sciences**

Thanks to planetary missions, high-resolution data (imagery, spectroscopy and elevation) are now available to the planetary science community. This very large datasets provide a fantastic playground for understanding other worlds. In order to analyze the data, complex image processing is required but demands an intense computing power and high parallelism of applications as the data offer higher and higher spatial and temporal resolutions. We currently develop and use up-to-date algorithms for assessing such tasks but show computing time limitations the large amount of data. A large amount of examples, benchmarks and advertisements have shown the fantastic improvement that GPGPU and more specifically CUDA architecture could offer to scientists in many fields. Most of our tools we develop and/or use are well adapted to massively parallel coding. We recently obtained a grant from NVIDIA's Academic Research Donation Support in order to port and/or develop tools for image processing onto GPGPU architecture.

The internship main goal would be to develop, port and/or adapt existing and new tools in image processing from planetary missions data. Several topics can be addressed including image correlation, photogrammetry, de-noising, pixel matching. In regards to the candidate interests and skills one or some of them can be addressed. Access to a workstation equipped with a NVIDIA Tesla Card (C2075, 6 Gb ECC, 515 Gflops in double precision) will be provided during the internship.

- Si vous estimez souhaitable que l'étudiant ait suivi un ou plusieurs des cours suivants :

- Instruments, méthodes d'observation et haute résolution angulaire au sol et dans l'espace
- Traitement des données

- Ce stage est-il susceptible d'une prolongation en thèse ?	non
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