Open position for an Engineer at Inria - SIROCCO research group in Rennes (ERC Advanced Grant project CLIM).

Development of a Light field editing tool

Light fields are densely sampled high-dimensional signals containing information about the light rays interacting with the physical objects in the scene. They yield a very rich description of a 3D scene which enables advanced creation of novel images from a single capture [1][2]. However, if we want the light field technology to be as widely used as classical imaging and video systems, it is necessary to offer the users the possibility to edit and manipulate light fields as it is quite common with 2D images and videos.

The goal of the engineer position will be to develop a light field editing tool which will integrated expected initial functionalities such as visualization of data, refocusing and view angle modification but also several extended functionalities: object segmentation, object removal, inpainting, super-resolution. Light fields segmentation [3], inpainting [4] and super-resolution [5] algorithms have been developed in the team. After having implemented the initial functionalities and developing a first user interface, the main task will then consist in re-writing these algorithms in c/c++. They will be then part of the editing tool as different plug-ins for the functionalities of segmentation, inpainting and super-resolution. They will be exploited thanks to an enriched user interface.

The position is funded by the ERC advanced grant project CLIM: Computational Light Fields Imaging. The work will be co-supervised by Laurent Guillo and Christine Guillemot.

Profile:

- Engineer or PhD degree in computer science or signal and image processing
- Solid programming skills (Matlab, C/C++), practical knowledge of GUI, graphic and mathematical libraries
- Practical knowledge of software development process (scm, agile method, continuous integration)
- Fluent in English, both written and spoken

Duration: 2 years
Start date: March or April 2017.
Location: Inria Rennes, France.
Contacts: Laurent.Guillo@inria.fr, Christine.Guillemot@inria.fr;
Please send applications via email, including:

- CV
- A cover letter discussing your motivation to apply for this engineer position.
- The names of one or two referees for letters of recommendation.

References

- [1] M. Levoy and P. Hanrahan, Light Field Rendering, ACM Siggraph, pp. 31-42,1996.
- [2] R. Ng, “Digital light field photography,” Ph.D. dissertation, Stanford university, 2006.
- [3] M. Hog, N. Sbater, C. Guillemot, Light Field Segmentation Using a Ray-Based Graph Structure, ECCV 2016
- [4] M. Le Pendu, X. Jiang, C. Guillemot, Consistent 4D Light Field inpainting via Low Rank Matrix completion, submitted, CVPR 2017
- [5] R. Farrugia, C. Galea, C. Guillemot, Super Resolution of Light Field Images using Linear Subspace Projection of Patch-Volumes, IEEE J. on Selected Topics in Signal Processing, submitted, 2016.