

Master Internship 2015
Automated tracking in 3D+time biological data

Supervisors
Dr. Thomas BOUDIER - thomas.boudier@ipal.cnrs.fr

Presentation of the project

In modern biology, imaging is a key element of all research, especially in developmental biology. Imaging a developing embryo from 1 cell to advanced stage with up to 200 cells is becoming more and more common, and helps understand the basics of cell behavior and differentiation. Many algorithms are available for cell tracking, but most of them rely on a prior accurate detection of the cells. However when the number of cells is high, accurate detection of cells may be difficult. The cell behavior is nevertheless constant (movements and divisions) and analyzing the tracking should help detect erroneous detections.

Expected deliverables

The candidate will implement different tracking algorithms, based on biological rules (move and division). The tracking result should then be analyzed, and in case of aberrant association between two time frames, the algorithm should give a feedback on how much and where possible erroneous or missing detections occurred. Furthermore we recently implemented a segmentation/classification procedure based on cell nucleus shape to classify the stage of cell division (GulMohammed, BMC Bioinformatics 2014). The tracking algorithm should also use this information to improve both tracking and segmentation.

Keywords

Tracking, segmentation, 3D, 4D.

Applicant profile

- Master Degree or Engineer Student (last year of studies).
- Skills in programming, preferably Java.
- Familiarity with image processing algorithms.
- Strong motivation towards this challenging project.
- Availability for 5 to 6 months starting in the first semester of 2015.

Gratification: About 800€ net per month



Image & Pervasive Access Lab
1 Fusionopolis Way
#21-01 Connexis, South
Tower
Singapore 138632

Tel. (65) 6408 2542
Director. (65) 6408 2536
Fax. (65) 6776 1378

secretariat@ipal.cnrs.fr
www.ipal.cnrs.fr