Guillaume THIBAULT, PhD
Born March 22nd, 1979

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Research Assistant Professor

Image processing
Computer Aided Diagnosis
Machine learning

Education

2009 **PhD in computer science, specialized in numerical images**.
Luminy, Aix-Marseille II University - France.

Professionnal background

Since 2015 **Research Assistant Professor**, Oregon Health & Science University, OCSSB, BME.

- Automatic segmentation and classification of nuclei in H&E images for robust tumor purity estimation, using image processing, clustering and deep learning.
- Electron Microscopy (EM) images analysis and segmentation.
- Automatic immunofluorescence (IF) images segmentation and quantification.
- MRI characterization for early residual cancer burden prediction.
- Deep learning.

2013-2014 **Post-Doctoral position, research engineer**, Oregon Health & Science University (OHSU), CSLU, OCSSB, BME.

- Automatic immunogold particles detection in EM images.
- EM and IF images analysis. Automatic cell segmentation, registration, characterization and classification.
- Machine learning.

2009-2012 **Post-Doctoral position, research engineer**, Ecole des Mines de Paris (ENSMP), Mines-ParisTech, Center for Mathematical Morphology (CMM).

Various projects in collaboration with:

- AP-HP, Télécom Bretagne (LaTIM) and ADCIS for TeleOphta project. The goal is the automatic detection of diabetic retinopathy in eye fundus images.
  - Project co-coordinator.
  - Supervisor of a PhD student and a master student.
  - Development of methods for the detection of the eye main structures: blood vessels network, papilla and fovea.
  - Working-out of methods for the detection of various pathologies related to the diabetic retinopathy: exudates, red lesions, cotton wools, etc.
  - Implementations in Java (utilization of Weka library), MorphM, Python and JMP (data statistical analysis).
- Pierre Fabre laboratory, CBIO and ADCIS, for RAMIS project. The goal was the characterization and the classification of cells (acquired from confocal microscope with fluorescence) in the various phases of mitosis in order to provide an automatic detection of new molecules in cancer cures.
  - Conception of new statistical methods of texture analysis for the characterization of cells.
  - Development of a new method of z-projection for image stacks.
  - Segmentation of adherent cells.

- Software in Java and Python (use of Weka and MorphM libraries) for the entire part of automatic image processing (projection, segmentation, characterization). MySQL use.

- L'Oréal Company. 3D dermis images characterization for patient age automatic classification.
- Michelin Company. Pneumatic tire cuts images segmentation in order to determine the rubbers repartitions.
- Dutch forensic police department. Automatic detection of falsified signatures according to a knowledge database.

Since 2010 **Consultant in computer science**.

- C4M Company. Image analysis applications development on Smartphone.
  - Feasibility study, specifications and modeling.
  - Objects detection and tracking, skin and faces.
  - Image processing.

2005-2009 **PhD thesis in computer science, specialized in numerical images**. Shape and texture indexes, application to cell nuclei classification.

The goal of the thesis was the elaboration of a complete system of classification of nuclei acquired by confocal microscope, in order to evaluate the impact of new treatments against Progeria disease.

- Analysis of cell specificities.
- Development of specific shape indexes and tests of many shape characterization methods.
- Development of a new statistical texture characterization method.
- Data analysis with JMP.
- Classification of cells using Weka library.

2007-4months **Project management: database conception**, for the Bouches du Rhône firefighters.

The goal was the development from scratch of a database for the management of preventive plan against forest fires.

- Analyze of specifications, and database conception.
- Supervision of an engineer.
- Implementation in Access.
- Integration and validation.

2003-3months **Development engineer**, development of LogiMask software for CarMask and Filétude companies. Software presented to Paris automobile innovation show.

The software realized cars bedding: an employee selected a model of car to paint, and the software controlled a table plotter which cut specific shapes in paper in order to protect plastic parts during the painting.

- Conception and modeling.
- Algorithmic and optimization for paper saving.
- Development with Visual Basic.
- Automation.

Educational activities

Since 2009 **Supervising:**

- PhD thesis of Xiwei Zhang (retinal images analysis).
- Third year trainee engineers from Ecole des Mines (blood vessels segmentation).
- Master 2 trainee (vascular network detection).
- Second year trainee engineer (database conception).

Since 2009 **Mathematical morphology practical sessions**, CMM summer school.

2005-2009 **Teacher in computer science and mathematics, degree and master,** faculty of sciences of Luminy, Aix-Marseille II University.

- C and Maple languages.
- Numerical images: image processing and pattern recognition.
- Mathematics for computer science.

Since 2007 **Moderator** on Developpez.net parts Algorithms/Math/Images/AI forums**.**

Numerical images and computer science occupations

- Pattern recognition (shape and texture characterization and classification).
- Image processing.
- Deep learning and machine learning.
- Computer aided diagnosis.
- Mathematical morphology.
- Programming languages: Java, C/C++, Python.
- Databases: Oracle, MySql, Access.
- Operating systems: Mac Os X, Linux, Windows.

Hobbies

- Firefighters volonteer (since 1997), CSP Aubagne (Bouches du Rhône) and CS Massy-Igny (Essonne, 2012-2013).
- Photography.
- Oenology.
- Sports (running, climbing, handball, badminton, krav maga, aikido).
- Humanitarian travel to Albania (September 1998): logistic, transport and distribution.