PhD position (M/F) – Thesis offer (M/F)
(Reference: MM_JLD_PhD_imagerie_042015)

Research topics  Second Generation of Tools in Image Forensics

Department  Multimedia Department

Parution date  April 10\textsuperscript{th}, 2015

Start date  ASAP

Duration  Duration of the thesis

Description  This thesis is granted by the National French Military Research Center.

Image forensics includes two major challenges:
- The detection of malicious manipulations;
- The identification of the sensors.

Even if image forensics is quite a new topic, some commercial products already exist. Nonetheless, several open problems still exist:
- The automation of analysis modules;
- The integration of such tools in standards, in particular of source coding; extension to video;
- The robustness of such tools against advanced attackers, themselves experts in image forensics (i.e. counter-forensics).

In this work, the Ph.D student will mainly focus on the automatic detection of image manipulations, according to the following three axes:

- **Automation**
  Currently, tools in image forensics require some manual steps that can be done by trained photo-experts. Automation of such tasks would save time, reduce costs attached to training and facilitate the spread of such tools to larger audiences with some new potential domains of application (e.g. social networks).

- **Robustness**
  Currently, tools work under the assumption that image manipulations are performed to fool human perception, with no assumption on the possible existence of digital detectors. In the close future, one can imagine that attacks will be improved so that they are undetectable by both humans and machines.

We may distinguish between different levels of manipulations:
1. Basic and global processing like source coding or zoom;
2. Advanced and local processing like cut & paste operations, inpainting.
• Video
The current tools are dealing with still images. Nevertheless, videos are more and more important. Extension of algorithms from images to videos is then a priority.

Prospective applicants are encouraged to read the following reference for more information about the exact topic: Digital image forensics: a booklet for beginners
JA Redi, W Taktak, J.-L. Dugelay
J. Multimedia Tools and Applications 51 (1), 133-162

Requirements
Education Level / Degree: Computer Engineering or Master Degree (with honors); English is mandatory, French is just a plus.

Application
The application must include (I, II and III):
• I-Curriculum Vitae
• II-Motivation letter of two pages also presenting the perspectives of research and education
• III-Names and addresses of three references

Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference: MM_JLD_PhD_imagerie_042015

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