



DIGITAL CAMERA FINGERPRINTS

Prof. Enrico Magli from Politecnico di Torino has been awarded of an ERC Proof of Concept grant by the European Union to develop the project "ToothPic", aiming at tracking the origin of every picture posted on the web: a tool against illegal and criminal use of pictures online

Torino March, 18 2016 - More than 1 billion Facebook users upload in excess of 350 millions of new pictures per day and 250 billions overall, not to mention other social media sites such as Flickr, Instagram, Google+, Tumblr and Pinterest, and these figures are growing steadily. Managing photos over the Internet is hence becoming an increasingly bigger problem with sizeable social and financial implications. It is hence not surprising that a huge problem has arisen for the users and social media sites alike: it is very difficult to track down a wide range of improper uses of the photos, such as exploiting them for commercial purposes, re-posting others' photos without consent or infringing copyright, posting photos containing unethical or illegal contents, and so forth. The lack of tools to face these issues may have a great impact on these photo sharing services, who may suffer from legal actions, and this may in turn disrupt the service's popularity.

A technology developed at Politecnico di Torino aims at validating a breakthrough technology to solve the problems described above. In fact, surprising as it may seem, each digital camera has a sort of fingerprint, unique for each device, which is invisibly left in each photo taken by that camera. The research project **"ToothPic - A large-scale camera identification system based on compressed fingerprints"** has the purpose to demonstrate that this fingerprint can be effectively used to manage the enormous amount of pictures online. The project, whose principal investigator is Prof. **Enrico Magli** from the Electronics and Telecommunications Department (DET) of Politecnico di Torino, will be granted by the European Union a funding of about euro 150,000 within the **ERC - Proof of Concept** funding scheme, specifically targeted to previously funded ERC projects devoted to the commercial or societal application of the obtained results.

The technical output of the project will provide a sound demonstration of the feasibility of this technology, developing a camera search engine able to find all the pictures on the web taken by a given camera. The key technology to realize this project is an innovative technique to compress camera fingerprints, developed by the researchers from Politecnico di Torino during a previous ERC Starting Grant, allowing a real time search among billions of pictures.

The advantages of this activity go far beyond the possibility to detect the unauthorized use of one's pictures. It will be possible for example to trace the authors of illegal contents, improving the reputation of photo sharing social networks in terms of safety and reliability. The camera search engine will be validated on a database of pictures downloaded from Flickr (more information and privacy disclaimer at www.toothpic.eu).