Research team develops face-mapping app for global smartphone searching

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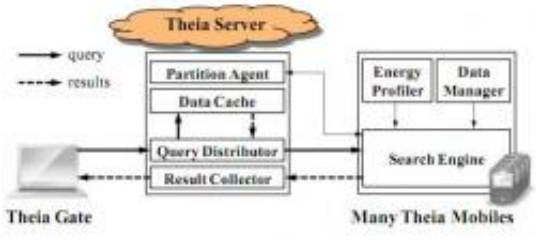

Architecture of Theia and information flow between its component. Image: arXiv:1106.5568v1 [cs.IR]

(PhysOrg.com) -- Researchers at Rice University have developed a smartphone app that appears both clever and interesting, but may never actually be used by anyone anyway. It's an app that when combined with a centralized server, combs people's cell phones looking to find photo's that have a face in them that match what someone is looking for. The team describes how their application would work in a paper they've uploaded to the preprint server *arXiv*.

The app, named Theia (perhaps for the Greek goddess of extent brightness) once installed on a user's phone allows for searching for images transmitted by a centralized server. If a match is thought to be made, the photo is sent back to the server for additional processing.

The whole point of the app is that there are times when most people wish for someone to be matched to a photo that might have been taken unintentionally. An image of a missing child's face, for example, might be included in a photo another family has taken at a playground, or perhaps someone wanted for a crime is on the loose and takes in a ball game and manages to wind up on a fan's smartphone as part of a bigger picture. Clearly such applications are all for the public good.

The problem is, of course, that not everyone would be open to installing an app on their phone that let's other people scan for, what are normally considered to be, private photo's. The possibility of abuse just seems far too likely. Also, when you consider that the app uses resources when performing its searches, slowing down the phone for normal use, it's hard to imagine many people agreeing to such a scenario, even in the instance where they would be paid some small amount for the processing time used by their phone.

Granted, some might be amendable to loading the app and allowing their phones to be searched during certain scenarios, such as right after a child abduction, or when a manhunt is underway, but leaving the app running so that anyone that signs up for the service can search for someone they are looking for, seems like an invitation to disaster. What if an abusive husband is looking for his wife, or a murderer is looking for a witness? How would the people running the server be able to differentiate the good from the bad? And finally, it seems that such a system would only be useful if the majority of phone owners agreed to use the app, which hardly seems likely.

Still, the idea behind the app is actually rather profound in that it highlights just how far we've come in a very short time. The idea of such an app just ten years ago would have seen both Orwellian scary and totally far-fetched.

More information: Opportunistic Content Search of Smartphone Photos, arXiv:1106.5568v1 [cs.IR] arxiv.org/abs/1106.5568

Abstract

Photos taken by smartphone users can accidentally contain content that is timely and valuable to others, often in real-time. We report the system design and evaluation of a distributed search system, Theia, for crowd-sourced real-time content search of smartphone photos. Because

smartphones are resource-constrained, Theia incorporates two key innovations to control search cost and improve search efficiency. Incremental Search expands search scope incrementally and exploits user feedback. Partitioned Search leverages the cloud to reduce the energy consumption of search in smartphones. Through user studies, measurement studies, and field studies, we show that Theia reduces the cost per relevant photo by an average of 59%. It reduces the energy consumption of search by up to 55% and 81% compared to alternative strategies of executing entirely locally or entirely in the cloud. Search results from smartphones are obtained in seconds. Our experiments also suggest approaches to further improve these results.

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