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To catch a cyber-thief

New search tool helps in fight against child porn, permits quick capture of e-criminals

2013-06-05 (Press-News.org) Montreal, June 5, 2013 – When local police came calling with child porn allegations last January, former Saint John city councillor Donnie Snook fled his house clutching a laptop. It was clear that the computer contained damning data. Six months later, police have finally gathered enough evidence to land him in jail for a long time to come.

With a case seemingly so cut and dry, why the lag time? Couldn't the police do a simple search for the incriminating info and level charges ASAP? Easier said than done. With computing devices storing terrabytes of personal data, it can take months before enough evidence can be cobbled together from reams of documents, emails, chat logs and text messages.

That's all about to change thanks to a new technique developed by researchers at Concordia University, who have slashed the data-crunching time. What once took months now takes minutes.

Gaby Dagher and Benjamin Fung, researchers with the Concordia Institute for Information Systems Engineering, will soon publish their findings in Data & Knowledge Engineering. Law enforcement officers are already putting this research to work through Concordia's partnership with Canada's National Cyber-Forensics and Training Alliance, in which law enforcement organizations, private companies, and academic institutions work together to share information to stop emerging cyber threats and mitigate existing ones.

Thanks to Dagher and Fung, crime investigators can now extract hidden knowledge from a large volume of text. The researchers' new methods automatically identify the criminal topics discussed in the textual conversation, show which participants are most active with respect to the identified criminal topics, and then provide a visualization of the social networks among the participants.

Dagher, who is a PhD candidate supervised by Fung, explains "the huge increase in cybercrimes over the past decade boosted demand for special forensic tools that let investigators look for evidence on a suspect's computer by analyzing stored text. Our new technique allows an investigator to cluster documents by producing overlapping groups, each corresponding to a specific subject defined by the investigator."

Fung says that, "out of all the types of available data in cybercrime investigation, text data is the most common medium used by scammers, identity thieves and child exploitation criminals. But this type of data is also the most challenging to analyze. It's really hard make a software program automatically interpret the underlying meaning of the text."

The researchers have also developed a new search engine to help investigators identify the relevant documents from a large volume of text. Says Dagher, "In a normal search engine, a user enters some keywords and results can vary – widely. In contrast, our search engine captures the suspects' vocabulary, and then uses it to improve the accuracy of the search results. Just like some cultures are said to have over 50 words for snow, criminals might have 50 words for... snow of a different kind! This search engine allows investigators to pick up on those nuances and quickly identify the incriminating documents."

"Experiments using real-life criminal data already suggest that our approach is much more effective than the traditional methods," says Dagher. This new method of quickly sifting through huge amounts of text to zero in on the evidence could soon be used by law enforcement agencies around the world, meaning future cybercriminals can go to trial much more quickly, saving time for the police – as well as money for tax-payers.

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Related links:

Concordia Institute for Information Systems Engineering http://www.ciise.concordia.ca/
National Cyber-Forensics and Training Alliance Canada http://www.ncfta.ca/
Gaby Dagher's website http://users.encs.concordia.ca/~daghir/

Benjamin Fung on Research @ Concordia http://www.concordia.ca/explore/#!/profile/111/
Concordia's Computer Security Library http://www.ciise.concordia.ca/CSL/

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A lucky catch: A tiny new fish, Haptoclinus dropi, from the southern Caribbean

2013-06-05 A new species of tiny blenniiform fish has been discovered in the biodiversity rich waters of the southern Caribbean. Haptoclinus dropi is only around 2cm in length with a beautiful color pattern that includes iridescence on the fins. The proposed common name of the species is four-fin blenny, due to the division of the dorsal fin into four sections, which is a distinguishing feature of the genus and unique among blenniiform fishes. The study was published in the open access journal Zookeys. This beautiful new species was discovered as a lucky bycatch during targeted ...

Laser-brightened cirrus clouds

2013-06-05 This news release is available in German. Can cloud formation, precipitation or thunderstorms be influenced by laser light irradiation? This issue has been investigated by researchers from KIT's Institute for Meteorology and Climate Research – Atmospheric Aerosol Research (IMK-AAF), Freie Universität Berlin, and the University of Geneva. The objective of the studies conducted by head of IMK-AAF Professor Thomas Leisner was to find out whether and in how far laser light and plasma can influence cloud formation. For their investigations, the researchers used ...

Award-winning researcher developed a method to accurately compare concert hall sound

2013-06-05 Researchers at Aalto University in Finland have developed a method that allows accurate comparisons of concert hall acoustics. The leader of the research group, Associate professor Tapio Lokki, was presented with an International Commission for Acoustics Early Career Award today in Montreal, Canada. The award was given to professor Lokki for outstanding contributions to room acoustics, and in particular for the novel subjective and objective assessment methods of concert halls. 'People have different tastes and unique preferences when it comes to the acoustics of a concert ...

First dual-action compound kills cancer cells, stops them from spreading

2013-06-05 Scientists are reporting development and successful lab tests on the first potential drug to pack a lethal one-two punch against melanoma skin cancer cells. Hit number one destroys cells in the main tumor, and the second hit blocks the spread of the cancer to other sites in the body, according to their report in the journal ACS Chemical Biology. Nathan Luedtke and colleagues explain that the spread of melanoma and other forms of cancer beyond the original location — a process called metastasis — makes cancer such a serious disease. Photodynamic therapy (PDT), which involves ...

University of Minnesota researchers control flying robot with only the mind

2013-06-05 Researchers in the University of Minnesota's College of Science and Engineering have developed a new noninvasive system that allows people to control a flying robot using only their mind. The study goes far beyond fun and games and has the potential to help people who are paralyzed or have neurodegenerative diseases. The study was published today in IOP Publishing's Journal of Neural Engineering. A University of Minnesota video of the robot in action can be viewed at http://www.youtube.com/watch?v=rpHy-fUyXYk. Five subjects (three female and two male) who took part ...

New research shows cheese may prevent cavities

2013-06-05 CHICAGO (June 5, 2013)—Consuming dairy products is vital to maintaining good overall health, and it's especially important to bone health. But there has been little research about how dairy products affect oral health in particular. However, according to a new study published in the May/June 2013 issue of General Dentistry, the peer-reviewed clinical journal of the Academy of General Dentistry (AGD), consuming cheese and other dairy products may help protect teeth against cavities. The study sampled 68 subjects ranging in age from 12 to 15, and the authors looked at the ...

Strength in numbers when resisting forbidden fruit

2013-06-05 A new study from the University of British Columbia helps explain how people become obsessed with forbidden pleasures. The study, which will appear in an upcoming edition of Cognitive, Affective and Behavioral Neuroscience journal, shows that when people are forbidden from something, it takes on a new level of focus. "Our findings show that when individuals are forbidden from everyday objects, our minds and brains pay more attention to them," says lead author Grace Truong, a graduate student in UBC's Dept. of Psychology. "Our brains give forbidden objects the same level ...

Neurochemical traffic signals may open new avenues for the treatment of schizophrenia

2013-06-05 Researchers at Boston University School of Medicine (BUSM) have uncovered important clues about a biochemical pathway in the brain that may one day expand treatment options for schizophrenia. The study, published online in the journal Molecular Pharmacology, was led by faculty within the department of pharmacology and experimental therapeutics at BUSM. Patients with schizophrenia suffer from a life-long condition that can produce delusions, disordered thinking, and breaks with reality. A number of treatments are available for schizophrenia, but many patients do not respond ...