

<http://www.post-gazette.com/local/city/2015/08/28/Software-developed-by-CMU-student-helps-find-online-sex-traffickers/stories/201508280284>



Software developed by CMU student helps find online sex traffickers

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By Joyce Gannon / The Pittsburgh Press

The universal scope of Internet advertising makes it an ideal way to attract customers and lure young participants into human trafficking activities including sex and prostitution, but behind those ads are layers of online data that can help investigators track down the criminals who organize and profit from such exploitation.

A fledgling Pittsburgh startup, Marinus Analytics, has a software product, Traffic Jam, that mines the so-called “deep web” for information and clues about trafficking operations and which is being used by law enforcement agencies including the FBI to identify offenders and rescue victims.

Marinus founder and chief executive Emily Kennedy, who began developing the product while she was a student at Carnegie Mellon University, said Traffic Jam has helped locate more than 120 victims of human trafficking and the firm has trained and assisted more than 75 law enforcement agencies and prosecutors’ offices that work on such cases.

The software uses machine learning, or artificial intelligence, to track and analyze patterns in publicly available data such as cellphone numbers that appear in online sex ads, and then connects those numbers with a wide range of other numerical data that can eventually lead to individuals involved in trafficking circles.

“We have a working relationship with Marinus and use their product to assist us in our own investigations,” said Gregory Heeb, special agent with the FBI’s Pittsburgh office.

Though he declined to discuss specific cases, Mr. Heeb said Marinus’ technology has “helped us to find a number of subjects and locate minors that were involved online. It’s helped us identify some victims and perpetrators.”

Other agencies that have utilized Traffic Jam, according to Marinus and CMU, include Utah’s Office of the Attorney General, the South Dakota Division of Criminal Investigation, the San Antonio Police Department and the Modesto Police Department in California.

Ms. Kennedy researched a way to delve deep into the Internet to aid human trafficking investigations as her senior honors thesis at CMU.

After she graduated in 2012, she became a research analyst at the Auton Lab in CMU's School of Computer Science, where her work on Traffic Jam received support from the federal Defense Advanced Research Projects Agency (DARPA). DARPA earlier this year awarded CMU a three-year, \$3.6 million contract to develop machine learning algorithms to help track sex traffickers through online ads.

At CMU, Marinus was also supported by the National Science Foundation's Innovation Corps program, which fosters commercialization of promising research projects.

Marinus spun out as a stand-alone venture last year, and last month, it was a runner-up in the inaugural UpPrize competition sponsored by BNY Mellon and the Forbes Funds to recognize technology companies that have a strong social mission.

With the \$200,000 Marinus received from UpPrize, Ms. Kennedy hopes to further develop Traffic Jam to improve its effectiveness for investigators; train more law enforcement officials and nonprofit victims' agencies on how to use it; and expand its use internationally.

"It's the biggest influx of funding we've received," said Ms. Kennedy, 25, who earned her bachelor's degree in ethics, history and public policy from CMU and has been passionate about learning more about human trafficking since she was a junior in high school.

Back in her hometown of Auburn in northern California, she first learned about human trafficking crimes from a church youth leader who had worked as a missionary in a red light district of Cambodia.

"I was really inspired by how he spent his time to pull girls out of the sex trade and provide rehabilitation and help law enforcement ... with something so horrible," she said.

By reading and educating herself on the issue, she became aware of the "intersection between technology and law enforcement" and decided to focus her senior thesis on data mining and how it can help solve trafficking crimes.

Among her advisers at CMU was Artur Dubrawski, co-director of the Auton Lab. Auton, which focuses on statistical data mining, was "an obvious place where some technology we have could make a big impact" on helping develop Ms. Kennedy's idea into a dedicated software product, said Jeff Schneider, Auton's other co-director.

Because the lab attempts to turn complex research into real-world applications, Mr. Schneider said, "That made Emily a great fit for what we do."

"She got help from some people in our lab with the initial prototype and she ran with it from there. But having the technology isn't enough; you need someone really passionate to carry the ball ... and Emily really made this happen on her own."

At CMU, Ms. Kennedy also received expert mentoring and assistance as an Olympus Probe project in the school's Center for Innovation & Entrepreneurship. Project Olympus identifies early-stage ventures with strong commercial potential and helps match products to the right customers.

For Marinus, there is "a large target market" including local and state law enforcement agencies, the FBI and the U.S. Department of Homeland Security, said Kit Needham, associate director and entrepreneur in residence at Project Olympus.

"As it turns out, there were very limited tools to help law enforcement find these [sex trafficking] rings ... they relied mostly on tips. Plus this area was very underfunded," she said.

Though Marinus is based in Pittsburgh, Ms. Kennedy splits her time between the city and northern California and doesn't maintain an office for the business. Its six team members work remotely and hold meetings usually at CMU or the Idea Foundry — a nonprofit business accelerator in Oakland which also provides advisory services to the company.

She declined to disclose the company's revenues.

Beyond human trafficking, Ms. Kennedy believes Marinus' technology could be applied to investigating other crimes including the resale of counterfeit goods online and monitoring extreme hate groups that may be planning terror attacks.

"So our work is sustainable for years to come," she said.