

How artificial intelligence can help in the fight against human trafficking

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The crime of human trafficking—defined by the U.S. Department of Homeland Security as modern-day slavery that "involves the use of force, fraud, or coercion to obtain some type of labor or commercial sex act—is notoriously difficult to prosecute.

"It is often misidentified as a single, isolated crime, like prostitution or a drug offense," says Dan Lopresti, professor and chair of the department of science and engineering at Lehigh University's P.C. Rossin College of Engineering and Applied Science. "And unless you put together the pieces, you don't realize there is a much bigger picture."

A group of computational researchers, experts in artificial intelligence (AI) and other members of the technology community is joining forces with [policy experts](#), [law enforcement officials](#), activists and survivors to help put the pieces together.

"Imagine the techniques that Google and Facebook are using to make a profit—understanding people, the way they connect, what their interests are, what they might buy or the activities they engage in," says Lopresti. "We can apply those same techniques—data mining, text mining, what's called graph mining—AI that's being used for legitimate and really profitable purposes, to track these illicit behaviors."

Although traffickers have embraced the internet and [social media platforms](#) to recruit potential victims and advertise to customers, Lopresti says, the same networks provide opportunities for rooting out

criminal activity.

As a member of the [Executive Committee of the Computing Research Association's Computing Community Consortium](#) (CCC), Lopresti helped organize a two-day conference at the United Nations in February called [Code 8.7: Using Computational Science and AI to End Modern Slavery](#). The conference brought together top researchers, policy makers, social scientists, representatives of the tech community and survivors for a deep dive into the topic.

The name Code 8.7 refers to Target 8.7 of the United Nations' Sustainable Development Goals which seeks to end forced labor, modern slavery, and human trafficking by 2030, and the worst forms of child labor by 2025.

For Lopresti, the time is ripe to move beyond our reliance on good—but fortuitous—observations to uncover crimes of human trafficking. It's time, he says, to leverage technology to support trained law enforcement in tackling this complex issue.

"Finding a solution to the problem of human trafficking is not just a technical one. It also involves social policy and political," he says. "As a researcher, if you don't understand this, you could come up with a solution that you think is elegant mathematically but is totally irrelevant in the real world. So that's why we wanted to be in the same room with the social scientists and the [policy makers](#)."

Since 2015, Jennifer Gentile Long, a graduate of Lehigh and chief executive officer of [Aequitas](#)—a resource for prosecutors working on cases of human trafficking and gender-based violence— and Lopresti have collaborated on computer-science-based efforts to help AEquitas manage and make use of the large amount of text data in legal documents to support the organization's work in helping prosecutors

build stronger cases.

The conference, which was co-hosted with the United Nations University Centre for Policy Research, the Alan Turing Institute, Tech Against Trafficking, University of Nottingham Rights Lab, and Arizona State University Global Security Initiative, kicked off what organizers plan to be a multiyear collaboration around the issue.

"It was amazing to see experts in all these fields come together and try to coordinate efforts so that people are working toward solutions, not working haphazardly," says Long. "They are making a true impact on this crime—identifying victims at points where they are missed, providing opportunities to leave and find safety, identifying perpetrators, and looking at policy in a coordinated effort. And it's so great to see Lehigh, in a way, sitting at the head of the table."

During the conference's closing session, survivors of human trafficking shared their stories with attendees.

"It reminded everyone," says Lopresti, "that even though we are talking about information, data, and policy, which all seem abstract, the data is real people. You can't treat a problem like this abstractly."

"Technology alone can't solve the problem," adds Long, "but when we combine it with training efforts to develop highly skilled, trauma-informed investigators and prosecutors, we can enhance victim identification and safety."

Mining the data for hidden evidence

Lopresti's participation in the global discussion around modern slavery follows his work outside the university on a local level, through his involvement with the Regional Intelligence and Investigation Center

(RIIC) in Allentown, Pa., a city of more than 120,000 located near Bethlehem, where Lehigh University is located.

Launched in 2013, the RIIC has "revolutionized" the way area police departments "analyze and share collected data to solve crimes," according to the office of Lehigh County District Attorney James Martin.

"I had no idea in our own backyard this was happening," Lopresti says. "But the same reason that drives Amazon to build a big warehouse in this region of the country—accessibility to large populations—is why this region, known as the Lehigh Valley, is also a hub for human trafficking, drug trafficking, gangs, and some very serious criminal activity."

Lopresti, who is an expert in document analysis and pattern recognition, is working with RIIC Director Julia Kocis , prosecutors, law enforcement officials and other Rossin College computer science and engineering faculty members—Jeffrey D. Heflin, Sihong Xie, and Eric P.S. Baumer—to help overcome the challenges of turning vast amounts of data, primarily from police incident reports, into something useable, despite limited resources.

"If an expert sits down and reads enough of these, he or she will find a common thread—this person is related to this place, which is related to this activity, which is related to this other person," he says. "The trouble is, they've got millions of these reports and just don't have enough time to read through them. We're developing natural language techniques, text mining and [data mining](#) techniques that are oriented to processing lots of data to identify patterns of behavior that would reflect illegal activities related to human trafficking."

Kocis presented their work at Code 8.7, emphasizing the "wealth of evidence that's evidence hiding within freeform text and unstructured

data that AI techniques can help identify." According to the Lehigh County DA's office, "Efficient access to this information will place law enforcement in a better position to help victims, investigate and prosecute traffickers and deter buyers."

Provided by Lehigh University

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