However, perhaps most important, is that ORCA needed to be user-friendly and provide understandable analysis. Cadets Damon Paulo and Bradley Fischl really took great initiative in the spring semester to assemble an excellent graphical front-end. Currently, Bradley is working with our law-enforcement partners to transition a version of ORCA to them.

You can read more about the ORCA software in our paper, entitled “Social Network Intelligence Analysis to Combat Street Gang Violence” in our pre-print available on-line at http://arxiv.org/abs/1306.6834. The paper will be presented in Niagara Falls in August at the International Symposium on Foundations of Open Source Intelligence and Social Informatics (FOSINT-SI), held in conjunction with ASONAM-13. Details available here: http://fosint-si.cpsc.ucalgary.ca/

Using Social Network Mining to Help Fight Street Gang Violence

By Dr. Paulo Shakarian

As a result of some of our recent work here at the Network Science Center at West Point, we were contacted by some law enforcement personnel asking how the algorithms we’ve developed could apply to the problems major police departments have with criminal street gangs. As it turns out, there is actually a great deal of similarity between the problems that some of these police face and counter-insurgency warfare. So, it made sense for us to collaborate.

We discussed the situation faced by our law enforcement counterparts with these gangs and identified several problems that are also of interest to the military. The resulting software we put together is called the “Organizational, Contact, and Relationship Analyzer” or ORCA. This software ingests arrest records and creates a social network among offenders who were arrested together. Our team for ORCA consists of Cadets Damon Paulo and Bradley Fischl as well as Electrical Engineering and Computer Science faculty LTC Tanya Markow, MAJ Michael Martin, and MAJ Paulo Shakarian.

The social network is then used to help answer a variety of questions. First, many offenders may be affiliated with gang members but do not admit to being in a gang. ORCA uses a logic programming approach (that we previously developed with our colleague Gerardo Simari of Oxford) to assign a “degree of membership” to each unaffiliated offender based on their connections to members of other gangs. ORCA also can be used to identify influential gang members who could potentially radicalize a group as well as identify relationships among sub-groups of gangs – creating an “ecosystem” of smaller criminal elements.

However, perhaps most important, is that ORCA needed to be user-friendly and provide understandable analysis. Cadets Damon Paulo and Bradley Fischl really took great initiative in the spring semester to assemble an excellent graphical front-end.

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The teams work was recently highlighted in the MIT Technology Review blog: http://www.technologyreview.com/view/516701/how-military-counterinsurgency-software-is-being-adapted-to-tackle-gang-violence-in/