Method developed to match police sketch, mug shot

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An example of how the MSU researchers' facial recognition system matches a police artist's sketch with a photograph. The image is from MSU's Pattern Recognition and Image Processing lab.

(PhysOrg.com) -- The long-time practice of using police facial sketches to nab criminals has been, at best, an inexact art. But the process may soon be a little more exact thanks to the work of some Michigan State University researchers.

A team led by MSU University Distinguished Professor of Computer Science and Engineering Anil Jain and doctoral student Brendan Klare has developed a set of algorithms and created software that will automatically match hand-drawn facial sketches to mug shots that are stored in law enforcement databases.

Once in use, Klare said, the implications are huge.

"We're dealing with the worst of the worst here," he said. "Police sketch artists aren't called in because someone stole a pack of gum. A lot of time is spent generating these facial sketches so it only makes sense that they are matched with the available technology to catch these criminals."

Typically, artists' sketches are drawn by artists from information obtained from a witness. Unfortunately, Klare said, "often the facial sketch is not an accurate depiction of what the person looks like."

There also are few commercial software programs available that produce sketches based on a witness' description. Those programs, however, tend to be less accurate than sketches drawn by a trained forensic artist.

The MSU project is being conducted in the Pattern Recognition and Image Processing lab in the Department of Computer Science and Engineering. It is the first large-scale experiment matching operational forensic sketches with photographs and, so far, results have been promising.

"We improved significantly on one of the top commercial face-recognition systems," Klare said. "Using a database of more than 10,000 mug shot photos, 45 percent of the time we had the correct person."

All of the sketches used were from real crimes where the criminal was later identified.

"We don't match them pixel by pixel," said Jain, director of the PRIP lab. "We match them up by finding high-level features from both the sketch and the photo; features such as the structural distribution and the shape of the eyes, nose and chin."

This project and its results appear in the March 2011 issue of the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

The MSU team plans to field test the system in about a year.

Provided by Michigan State University