

# MO IAI SPRING NEWSLETTER

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## MUPD Solves Professor's Murder DNA Evidence is Key to solving Case

Story by Mark Barna

Eight years ago, the MU community was shocked by a gruesome killing of a retired research assistant professor in a parking garage in the light of day.

ment agencies involved in solving the case. "This brings closure on the tragedy to our family, as well as to the University of Missouri and Columbia communities as a whole," the

crobiology lab in the School of Medicine. The majority of his research was with Dr. H.D. Kim, chair of the pharmacology department.

### Special points of interest:

- MUPD Solves Homicide with DNA evidence.
- MOIAI Officers have board meeting
- Letter from Kevin Bushery

Despite some 300 leads investigated by the MU Police Department, the murder of Jeong H. Im went unsolved until recently. MU Police Chief Jack Watring announced Jan. 30, 2013, that based on DNA evidence gathered at the scene the killer was Timothy Aaron Hoag, a 35-year-old male with a history of violence. On Aug. 9, 2012, Hoag committed suicide by jumping off a downtown parking garage.



Capt. Brian Weimer of the MU Police Department announcing that the killer of Jeong H. Im has been identified Jan. 30, 2013, at MUPD headquarters. Photo by Nicholas Benner.

MU Chancellor Brady J. Deaton expressed his "heartfelt compassion" for the victim's family, given the years the case went unsolved. Its resolution "is the most important news we will hear this year," he said.

The breakthrough came Dec. 21, 2012, when MU Police received a tip that Hoag had committed the murder. Investigators obtained his blood sample that was collected after

The family of Im, who use the Korean surname lhm, thanked MU police and the other law enforce-

statement said. At the time of his death, Dr. Im was working in Kim Wise's mi-

he committed suicide, and they sent it to the Missouri State Highway (See MUPD Page 4)

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## MO IAI Officers Board has First Meeting of Year

The Missouri Division of the IAI had their first board meeting February 1st. While at this meeting many topics were discussed. A synopsis is as follows.

The board discussed possible topics for the 2013 annual fall conference. The annual fall conference

will be held at the Inn at the Grand Glaize this year. The board also discussed possible topics for presentation.

The board discussed and approved the a monetary contribution to the Johnson Whyte Foundation.

The board further discussed plans for the 50th Golden Anniversary conference. The board would like to remind the members that if they have suggestion to contact an officer or committee. The committee is made up of Kevin Bushery, Tim Zoll and Teresa Clerkin.

## Do you have an idea for a new logo for the Missouri IAI?

The officers of the MOIAI are asking you to create the new logo for our division to be used during the 50th anniversary year in 2014. Entry's must be submitted to an officer by May 1st, 2013. The winner will be announced at the 2013 educational conference. The winner will receive a night's stay at the Inn at Grade Glaize and free admission to the 2014 educational conference.

## Image-Based Matching Technology Offers Identification and Intelligence Prospects

The FBI's Integrated Automated Fingerprint Identification System (IAFIS)—the largest criminal biometric database in the world—is steadily making way for the Next Generation Identification (NGI), which will extend automated biometric identification capabilities beyond fingerprints and palmprints. Although law enforcement has used photographs of scars, marks, and tattoos (SMTs) for several years to help identify or eliminate suspects, the NGI will automate that process. In 2014, investigators will be able to query the NGI with descriptive data about tattoos to find images of potential matches of SMTs associated with individuals' records. Equally notable, however, is that right now, the FBI's Biometric Center of Excellence (BCOE) and its partners are advancing image-matching technology that will enable investigators to use a probe, or query image—with *or without* descriptive data such as key words or characters—and find similar images.

The BCOE, headquartered at the Criminal Justice Information Services (CJIS) Division in Clarksburg, West Virginia, is the FBI's focal point for biometrics and identity management. It is an initiative of the Science and Technology Branch, which includes the Laboratory Division, the Operational Technology Division, and the CJIS Division. Together, scientists, technicians, and biometric experts from these divisions are supporting the BCOE's mission to "foster collaboration, improve information sharing, and advance the adoption of optimal biometric and identity management solutions within the FBI and across the law enforcement and national security communities." In short, the BCOE is exploring new and existing biometric modalities, or

types, and maximizing their potentials.

With image-based matching technology, the BCOE's goal is to avoid the subjectivity inherent in text-based searches by using computer algorithms to search the features of other stored images and locate a potential match. An example of the subjectivity involved in labeling images, even when using the American National Standards Institute/National Institute of Standards and Technology (ANSI/NIST) standards for classifying an image's class and subclass, follows.

When looking at the image shown above, some users might see the letter "D" in this image and label its ANSI/NIST class/sub-class as "Other/Wording." Other users might consider the image a logo for the Detroit Tigers and label it as "Symbol/Miscellaneous Symbol," based on what they think it represents. Still others, due to the image's orientation, might interpret the image as a face and label it as "Human/Abstract Face." Computerized labeling, or indexing, increases the likelihood of finding similar images.

The BCOE's academic partnership with Michigan State University facilitated the development of the TattooID prototype for the automated retrieval, indexing, and matching of SMTs. To use the TattooID prototype, an analyst enters a probe image, key words, or characters into the program that employs an image-matching algorithm. The algorithm runs against images stored in the database and provides any similar images, ranked with match scores. Such a search can be run for images of the same general design, or it can be limited to include only those images of tattoos on designated body areas, e.g., a person's shoulder. Although search results do not provide positive identifications at this

point, they could help narrow a suspect list.

The BCOE recently finished building a tattoo dataset to test and evaluate the image-matching algorithms in the TattooID prototype. The testing will cover four basic scenarios: (1) tattoos from the same individual captured at different booking events; (2) similar tattoos on different individuals; (3) region of interest (matching small portions of an image to the larger image); and (4) matching across various media (drawings, stencils, photographs, etc.). To build the collection of images for testing, examiners analyzed tattoo images from the FBI Photo File and labeled the images according to ANSI/NIST classification standards. Furthermore, examiners ranked the similarities of images within the same class/sub-class, e.g., animal/bird. Once testing is completed, the BCOE will evaluate the prototype's performance and assess strengths and weaknesses of the current capability.

While the value of image-to-image matching technology is obvious from an identification perspective, the benefits of knowing the symbolism and background behind tattoos and graffiti can be equally valuable. From an intelligence standpoint, certain symbols or graffiti may be used to help establish whether an individual is associated with a particular gang, terrorist organization, or extremist group. This may help determine the extent to which the individual or gang poses a threat to law enforcement or the community, and possibly to recognize and link crimes across the country. This helps secure the safety of officers during investigations and arrests, and it can even possibly help with crime interven-

tion strategies. Applying its research with image-based matching technology with a bend toward relating the meaning of symbols, the BCOE recently collaborated with the Cryptanalysis and Racketeering Records Unit (CRRU) of the FBI's Laboratory Division on the development of the prototype image-comparison system, Tattoo and Graffiti Image-Matching and Graphic Evaluation (TAG-IMAGE). This investigative tool was designed to help the CRRU match images within its database and to determine the significance of tattoos, graffiti, or other cryptic symbols for FBI investigative programs dealing with foreign or domestic terrorism, violent crime, or gangs. Rather than using metadata or text searches, TAG-IMAGE uses advanced image-to-image technology to match symbols based on actual appearances. It may also provide raw information on a symbol's actual use, rather than leaving speculation as to its meaning or origin.

With TAG-IMAGE, a contributor e-mails an image to the CRRU, where an analyst enters the probe image into the system, which compares it with images stored within the CRRU database. Once a search is completed, a CRRU analyst e-mails a response to the contributor

(see Imaging Pg. 3)

### Letter from Kevin Bushery, MOIAI First Vice President

While it may be early in 2013, it is not too early to start planning for our Division's Golden Anniversary in 2014. Do you know that the Missouri Division is the tenth oldest chartered Division of the IAI and there are three other Divisions celebrating their Golden Anniversary in 2014.

An Anniversary Committee has been established to help plan for this milestone which is made up of Kevin Bushery, Ballwin PD, Tim Zoll, Fergu-

son PD and Teresa Clerkin, Jefferson City PD. The Anniversary Committee and the Division Board and Officers want the Anniversary Educational Conference to be special, but we need your help. We want the training to focus on the Crime Scene and Latent Print certification testing process. Please tell us what training you would like to see. Do you have any speakers in mind?

We would also like to plan a formal banquet for Friday

evening and give out attendance prizes at that time. In past years we have focused on crime scene/fingerprint related items for attendance prizes. This year we are looking for a variety of quality prizes to hand out. If anyone can solicit prizes on behalf of the Division to be given out it would be appreciated. Anyone obtaining attendance prizes can either hold them for the conference or contact the First Vice President Kevin Bushery who can collect them and transport them to the

2014 conference.

To mark this momentous occasion, the Division has designed a challenge coin and is looking at new clothing items with a new Division emblem designed by one of our members. Remember, the Division member who submits the winning design gets one night lodging for the 2014 conference and conference registration paid.

### Department of Justice & National Institute of Standards & Technology Announce Launch of National Commission of Forensic Science

The U.S. Department of Justice and the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) announced today the establishment of a National Commission on Forensic Science as part of a new initiative to strengthen and enhance the practice of forensic science. The National commission on Forensic Science will be composed of approximately 30 members, bringing together forensic science service practitioners, academic researchers, prosecutors, defense attorneys, judges and other relevant stakeholders to develop policy recommendations for the Attorney General. The commission will consider guidance on practices for

federal, state and local forensic science laboratories developed by groups of forensic science practitioners and academic researchers administered by NIST. "forensic science is an essential tool in the administration of justice and needs to be continually evaluated as science progresses," said Deputy Attorney General James M. Cole. "Forensic science helps identify perpetrators, convict the guilty, exonerate the innocent, and protect public safety. This initiative is led by the principle that scientifically valid and accurate forensic analysis strengthens all aspects of our justice system."

"The Department of Jus-

tice and the National Institute of Standards and Technology have a history of successful collaboration," said Under Secretary of Commerce for Standards and Technology and NIST Director Patrick Gallagher. "Through the initiative, we will work even more closely with the forensic science community to strengthen the forensic Science system." The commission will have responsibility for developing guidance concerning the intersections between forensic science and the courtroom and developing policy recommendations, including uniform codes for professional responsibility and requirement for training and certification. The new initiative provides a framework for coordination across foren-

sic disciplines under federal leadership, with state and local participation. The Department of Justice, through its involvement in the commission, will take an active role in developing policy recommendations and coordinating implementation. The NIST-administered guidance groups will develop and propose discipline-specific practice guidance that will become publicly available and be considered for endorsement by commission and the Attorney General. This Coordinated effort will help to standardize national guidance For forensic science practitioners. Additionally, NIST will continue to develop methods for forensic measurements. And validate select existing forensic science standards.

(See Department of Justice pg. 4)

### Imaging from pg. 2

that includes pictures of similar images as well as any associated details and contact information. The submitted image then becomes available for future comparisons by other agencies. The CRRU has begun a pilot pro-

gram using the TAG-IMAGE prototype. After the pilot phase ends, TAG-IMAGE will become available to local, state, tribal, and federal law enforcement and correctional agencies.

The BCOE also plans to conduct a small operational pilot program with the National Gang Intelligence Center to assess the feasibility of image-based matching and to gain user feedback. Ultimately, the BCOE hopes to use

this biometric research to enhance FBI operations.

Reprinted from [www.FBI.gov/CJISlink](http://www.FBI.gov/CJISlink). December 2012 issue.

## Johnson-Whyte Memorial Foundation Fund

Many student members of the Missouri Division who are not members of the Parent Body of the I.A.I., may not be aware of an excellent opportunity available to them—The Johnson-Whyte Memorial Foundation Fund. The IAI realizes the importance of education and research in the field of forensic identification. The J-W Fund has been established to fund scholarship grants and is available to anyone whether they are an I.A.I. member or not. Research grants are available to IAI members only.

Scholarship applicants must be enrolled in a full-time course of study at a Council for Higher Education Accreditation (CHEA) accredited college or university. The degree being sought must be related to employment in the field of Forensic Identification. Undergraduate applicants must be juniors or seniors during the

### Department of Justice from page 3

Specific criteria for membership will be announced in an upcoming *Federal Register* notice, and applicants will have 30 days from the publication of the notice to submit their

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Fall term of the year in which the award is to be given. Applicants must have a cumulative grade point average of 3.0 or higher on a 4.0 scale. Successful applicants will be announced at the 98th Annual Educational Conference in Providence, RI this summer, but do not need to be present.

Vocational scholarships may be provided to IAI members seeking to attend the IAI's Annual Educational Conference. Scholarship applicants must be active members of the IAI attending an official conference of the IAI in a country other than the country in which the applicant resides. Active membership for longer than one year is required before an application may be submitted. Scholarships awarded in this category will be based on financial need

applications.

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## Dues Renewal:

The 2013 Missouri Division IAI renewal of dues are approaching. Avoid being considered inactive and pay your dues by March 30th 2013. If dues are not paid by May 1st your membership will be considered inactive. You will then have to re-enroll and pay the initiation fee.

Dues for the 2013 year are \$20.00.

You can download the dues renewal form from the MOIAI website.

and preference will be given to those members who are actively involved in the conference as lecturers or poster presenters.

In an effort to promote the field of Forensic Identification, the Foundation may be used to fund research projects. Grants may be requested in the category of Operational Effectiveness or Health and Safety.

This program is administered by the IAI Board of Directors under the guidance of the Johnson-Whyte Memorial Foundation Fund Advisory Committee, of which I am proud to chair. If you would like to apply, visit the IAI website at [www.theiai.org/foundations/funding](http://www.theiai.org/foundations/funding) or contact me directly at [trzoll@charter.net](mailto:trzoll@charter.net).



Capt. Brian Weimer credits Detective Sgt. Shawn Spalding for bringing the Im murder case to resolution. Chancellor Brady J. Deaton notes it was a "community effort to solve the case." Photo by Nicholas Benner.

### MUPD from page 1

Patrol Crime Lab for analysis. Hoag's DNA matched that found at the crime scene.

The murder of Im on Jan. 7, 2005, was so unnerving in part because it was so brazen.

At about 10:30 a.m., the 72-year-old Im is seen on grainy surveillance video leaving the School of Medicine en route to the Maryland Avenue Parking Structure. Two hours later, police and firefighters arrive on Level 3 of the garage, where Im's 1996 Honda Accord was on fire.

Im's body was found in the trunk. He had been stabbed to death, stuffed

in the trunk, and the vehicle was set on fire, investigators determined.

The Dec. 21 tip led to another person, the name of whom police have not released, who claims to have been with Hoag on the day of the murder, MU Police Capt. Brian Weimer said. He drove Hoag to the garage the morning of the killing so "Hoag could get a car." Later that day, the driver received a call from Hoag demanding to be picked up at a business north of campus and to bring gasoline, Weimer said.

The driver took Hoag to Level 2 of the Maryland Ave-

nue garage thinking that Hoag needed gasoline to start his car. With gas container in hand, Hoag proceeded upstairs to Level 3. When Hoag returned, the driver told police, he was wearing a particle facemask and a hood over his head. As they drove away, the driver noticed smoke billowing from Level 3. The driver never came forward "out of fear for his family's safety," Weimer said. Reprinted with permission of MIZZOU magazine.



2006 photo of Timothy Aaron Hoag courtesy of MUPD.