

InfraGard Presentation

February 18, 2005

Dr. David S. Burris, Professor of Computer Science at Sam Houston State University, addressed FBI agents and leading commercial infrastructure assurance professionals in the InfraGard Houston Members' Alliance on the topic of Cryptography Basics, hosted at the Houston FBI Headquarters. Dr. Burris's presentation provided an introduction to data encryption methodologies, approaches to managing data integrity and a cost benefit analysis of cryptanalysis, the art and science of breaking codes.

The Computer Science Department at Sam Houston State University, in conjunction with the College of Criminal Justice, supports research and training in information assurance and data security through the Center of Excellence in Digital Forensics, a federally funded center supporting the training of law enforcement personnel in the collection, identification, management and investigation of digital evidence.

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InfraGard is a national infrastructure protection organization sponsored by the FBI to support attempts to safeguard and secure critical infrastructure installations from natural disaster and terrorist attack. InfraGard Houston chapter sponsors a regional conference each year, and monthly training and education sessions.

Forty people were in attendance for the presentation at the February training session, a significant increase over previous sessions. The attendees included FBI field agents and Houston PD officers as well as security professionals and technicians.

Dr. Burris' talk provided a comprehensive introduction to basic terminology and methods used to encrypt and decrypt digital information. The talk additionally examined:

- Hashing methods
- Digital integrity
- Assuring confidentiality
- Authentication
- Non-repudiation
- Symmetric and asymmetric cryptography algorithms
- Secure socket layers (SSL)
- Digital signatures & envelopes
- Key Stores, exchanging keys over an insecure medium

Following Dr. Burris' presentation the question and answer session revealed a significant interest and

demand within Federal, State, City and commercial organizations for individuals knowledgeable in digital forensics, cyber security, and cyber terrorism. The primary concern appeared to center on obtaining personnel with existing appropriate technical skills; with the legal and criminal justice background being taught in-service. In conjunction with that demand there was an evident recognition that no useful sources of potential security personnel exist at present.

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Center of Excellence in Digital Forensics (CEDF)

The establishment of CEDF allows the university to augment its well-established Criminal Justice facilities for both emerging and existing professionals by establishing facilities for teaching, to provide new digital forensics professionals; research, to develop new approaches, techniques and methodologies in the detection, preservation, analysis and preservation of digital evidence; and service, to provide databases to improve, among other concerns, digital forensic profiling and digital fraud investigation, digital tools to improve data detection/recovery and network security. Through successful implementation of this FY 2004 proposal, we seek to achieve the following goals:

- Develop appropriate curricula integrating Criminal Justice and Computer Science at the undergraduate and graduate level to provide opportunities for students in professional digital forensic areas.
- Provide appropriate continuing professional education curricula to meet the needs of regional law enforcement agencies, investigative and judicial agencies.
- Establish teaching, research and service facilities in Data Recovery, Information Assurance and Network Security.
- Establish research/service programs focusing on the development of digital forensic profiling databases and digital fraud investigation systems to support professional agencies in conjunction with established Criminal Justice organizations such as the Institute for the Study of Violent Groups and the Law Enforcement Management Institute of Texas.
- Pursue recognition by the National Science Foundation as a Center of Excellence in Digital Forensics and as a Center of Academic Excellence in Information Assurance Education by the National INFOSEC Education and Training Program (NIETP)