



NOVEMBER 24, 2008

SABER TECHNOLOGY ASSESSMENT PREFACE

The FBI Biometric Center of Excellence (BCOE) is pleased to share the results of an independent assessment of biometric technology conducted by the MITRE Corporation titled the *State-of-the-Art Biometrics Excellence Roadmap* (SABER). The SABER study was funded by the BCOE and completed in June 2008. The enclosed volumes assess the technical maturity of biometric modalities and evaluate the potential for expanding the FBI's Certified Products List as these modalities mature.

More specifically, the Technology Assessment is intended to provide a common understanding of relevant biometric technologies, address National Science and Technology Council (NSTC) Grand Challenges, and suggest potential areas for further investigation by the FBI and its research partners. It provides a roadmap based on the solid foundation that the FBI has established as a leader in fingerprint and DNA technology and seeks a pragmatic course forward using additional cost-effective and proven technologies. Within this publication, you will find an analysis of biometric modalities as they relate to current applications, market and industry, performance standards, and promising areas for further research by the FBI and our research partners. The modalities presented in this assessment are fingerprint, palmprint, vascular, face, iris, ear, voice, handwriting, and Deoxyribonucleic acid (DNA).

The results of the SABER study represent an important plank in our biometrics efforts, one that will help us strategically prioritize the FBI's biometric research and funding activities. Likewise, we believe the results of this technology assessment portion will benefit you—our government, academic, and industry partners—as the biometric community continues to address interoperability issues, assess future progress, and evaluate new technologies.

We, at the FBI, are proud of the leadership role we have played in applying biometric science and technology to criminal justice, national security, and civil purposes.

- We pioneered fingerprint identification services in the 1920s and revitalized the process in the 1990s by partnering with the law enforcement community and sponsoring the development of the Integrated Automated Fingerprint Identification System (IAFIS). IAFIS, a national fingerprint and criminal history system of over 59 million subjects, reduced turnaround time for results from months to minutes. The expansion of IAFIS from fingerprint to include automated processing of palmprint and other technologies is being pursued through our Next Generation Identification Program (NGI).
- Our DNA work and sponsorship of the Combined DNA Index System (CODIS) has revolutionized the use of the "genetic fingerprint" to establish both guilt and innocence in criminal investigations. This system links together seemingly unrelated cases (including serial crimes) so they can be investigated in tandem, and positively identifies not only criminals and terrorists but also the remains of victims and missing persons, often years later. CODIS has evolved from its 1990s pilot program status to a functional system that stores DNA profiles from around the country in a series of national, state, and local databases, all linked via computers. This linkage enables crime labs at every level to securely share and compare DNA profiles electronically.

- We continue our research on voice recognition and have field-tested the Forensic Audio Recognition System (FARS) prototype. In addition, our scientists are advancing research in the forensic and investigative applications of facial and handwriting recognition.
- Our leaders and biometrics experts maintain a strong presence in the Biometric and Identity Management Subcommittee sponsored by the NSTC, leverage well-established ties with the research community, actively participate in science and technology working groups and standards and interoperability forums, and collaborate broadly with various stakeholders across the biometric community.

Our latest initiative, the establishment of the BCOE, is helping to maintain this momentum by facilitating and coordinating biometric and identity management activities across the FBI and broader biometric community. The BCOE, headquartered in Clarksburg, West Virginia, is the FBI's focal point to foster collaboration, improve information sharing, and advance the adoption of optimal biometric and identity management solutions across the law enforcement and national security communities. This program is strengthening criminal investigations and enhancing national security, while protecting the privacy rights of individuals. The BCOE's approach is built upon the best practices of the FBI's extensive experience as a leader in the application of biometric technologies.

As we move forward, it is critical to ensure a coordinated effort across our community to effectively harness the benefits of emerging biometric technologies to support our nation's law enforcement and intelligence missions. The publication of the SABER Technology Assessment represents part of our information sharing efforts. We welcome your feedback regarding this publication and hope that you will visit www.biometriccoe.gov to provide comments. In the future, we look forward to regularly publishing the results from new and ongoing BCOE-sponsored initiatives.

LOUIS E. GREVER
Executive Assistant Director
Science and Technology Branch
Federal Bureau of Investigation