**Introduction**

- Trust and privacy are the cornerstones of a free and democratic society.
- Pervasiveness of information technology is enabled or inhibited by their strength.
- Next-generation user authentication must move beyond IDs and passwords.
- Biometric authentication tightly binds user actions to the user’s physical traits or attributes.

**Objective**

Establish an integrated technical and societal research framework for biometric systems which is a prerequisite for the technology to serve as the cornerstone of trusted and secure identity management systems.

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**Approach and Impact**

**Proposed approach:** Establish an integrative framework and foundation through interdisciplinary research in four key areas

- Performance evaluation framework
- Reduction of performance barriers and system vulnerabilities
- Societal impact and technological maturity
- System design framework

**Research Impact**

- Expands analysis beyond sub-systems (e.g. matching algorithms for fingerprint)
- Enables statistical validation of performance
- Considers societal implications

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**Performance Evaluation Framework**

Develop appropriate statistical models and methods for:

- Multi-biometric system evaluation (MUBI)
- Detection of error rate changes over time
- Confidence intervals and sample size calculations for FAR/FRR/ROC (PRESS)

**Societal Impact**

- Report on legal implications and societal, cultural and psychological barriers facing deployment of biometric.
- Enable an understanding of the interface between domestic and international law and societal acceptance.
- Results show general support if limited to a viable policy objective and include policies to enhance privacy and anonymity

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**System Design Framework**

- Two distinct levels of analysis – subsystem and application.
- Develop Biometric System Design Matrix from which design patterns can be extracted and assessed.

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**Performance Barriers and Vulnerabilities**

- Establish performance gains from multibiometrics including cascaded, multi-algorithmic facial recog., iris-face fusion, etc.
- Address vulnerabilities through spoofing/liveness, image regeneration from templates, and aberrant behavior detection

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**Survey Instruments**

- 500-Subject Survey in conjunction with multi-university multi-biometric data collection.
- 1,000 Random Digit Dial Survey: General Societal Perceptions.
- Nine focus groups of users and non-users.

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**NSF Cyber Trust Principal Investigators Meeting**

March 16-18, 2008

New Haven, CT