

**SBIR Topic Number:**  
AF05-099

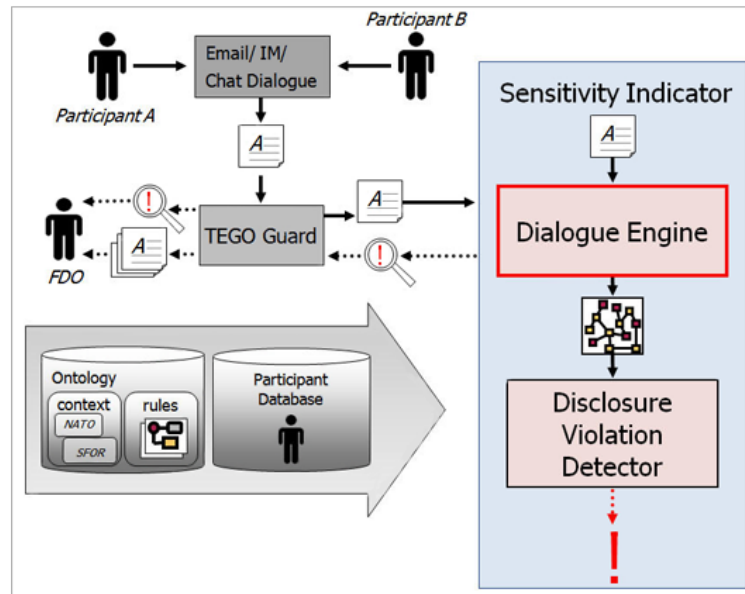
**SBIR Title:**  
Automated Tools to Assist  
Foreign Disclosure Officer  
Duties

**Contract Number:**  
FA8750-06-C-0027

**SBIR Company Name:**  
21st Century Technologies,  
Inc., Austin, TX

**Technical Project Office:**  
AFRL Information  
Directorate, Rome, NY

This Air Force SBIR/STTR Innovation Story is an example of Air Force supported SBIR/STTR technology that met topic requirements and has outstanding potential for Air Force and DoD.



Tego Imports Information from E-mail, Instant Messaging, and Voice Transcriptions

# Innovative Information Extraction and Graph Pattern Matching Technology

- The Air Force has a need for improved information security technology that protects against the unwanted release of information to inappropriate recipients
- Tego monitors chat communication sessions and alerts a Foreign Disclosure Officer when the information disclosure boundary has been crossed
- 21st Century Technologies, Inc. (21CT) developed Tego—a state-of-the-art Information Extraction and Graph Pattern Matching technology that enables effective and secure communication by automatically detecting violations in information disclosure
- The Tego technology is a force multiplier—increasing coverage without increasing manpower requirements

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## Air Force Requirement

The Air Force has made a large investment in information technologies that ensures that the right information is received by the right person at the right time for effective decision-making. However, there is an immediate need for improved information security technology that protects against the unwanted release of information to inappropriate recipients. The ever-increasing percentage of products with free text (including XML) is putting a significant burden on release authorities, including the Foreign Disclosure Officer (FDO), in multi-national operations.

Instant Messaging (IM) has become a prime method of time-effective communication for the U.S. Armed Forces overseas because of its immediacy and low bandwidth. However, it is also insecure and difficult to monitor. Current FDO workflows are manual, complex, and time-consuming and leave analysts overburdened by the large amounts of communications passing through government systems.

## SBIR Technology

In response to this Air Force SBIR requirement, 21st Century Technologies, Inc. (21CT) developed Tego—a state-of-the-art Information Extraction and Graph Pattern Matching technology that enables effective and secure communication by automatically detecting violations in information disclosure. Tego monitors chat communication sessions and alerts an FDO when the information disclosure boundary has been crossed. By protecting critical information through the interception of harmful messages before they are delivered, Tego empowers the FDO to address these situations, resulting in significantly improved security with reduced manpower.

Tego streamlines the information extraction process, pruning the disclosure search space and semi-automating the discovery of information disclosure violations in IM traffic to provide improved security for online chat. The Tego research prototype analyzes text messages between U.S. and foreign coalition personnel to detect intentional and unintentional disclosures of sensitive information and then generates an alert for the FDO. Tego automates much of the analysis of textual communication and provides the alert as information disclosure becomes an issue.

Operational applications of Tego research include:

- Information Assurance—Securing the content of coalition communications
- Intelligence Discovery—Discovering disclosure violations in adversarial text

## Potential Air Force Application

Some of the key features and benefits of Tego include:

- Monitors, prevents, and mitigates the effects of sensitive information disclosures
- Enables user alerts of impending disclosures during conversation via near-real-time processing
- Increases coverage without increasing manpower requirements—a force multiplier
- Allows coverage of multiple domains (e.g., mission planning, technical briefings, and informal correspondence) and media (e.g., chat, email, and voice)
- Provides customization to operational environments

Leveraging a dataset developed by MITRE, 21CT is demonstrating the Tego dialogue processing methods against a dataset that represents the operational domain. 21CT has identified several operational government customers and companies as commercialization partners and is currently pursuing these opportunities for operationalizing and transitioning the SBIR research

## Company Impact

The Tego SBIR project has focused increased DoD and industry attention on 21CT's R&D capabilities. In January 2008, 21CT participated in the U.S. Air Force Technology Interchange Workshop in Norwood, Massachusetts, which was sponsored by the Air Force Research Laboratory and the Electronic Systems Center. 21CT was one of 16 small businesses invited to attend the SBIR Phase II project one-on-one meetings. Two of 21CT's recent SBIR projects were requested to be presented to prime contractors, one of which was Tego.

21CT's mission is to create best-in-breed solutions that make a positive impact on the global community. The firm's core technical competencies are graph pattern matching, image processing, genetic algorithms, natural language processing, modeling information flow, machine learning, complex network modeling, data mining, data fusion, game theory, and group detection.



# SBIR/STTR

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