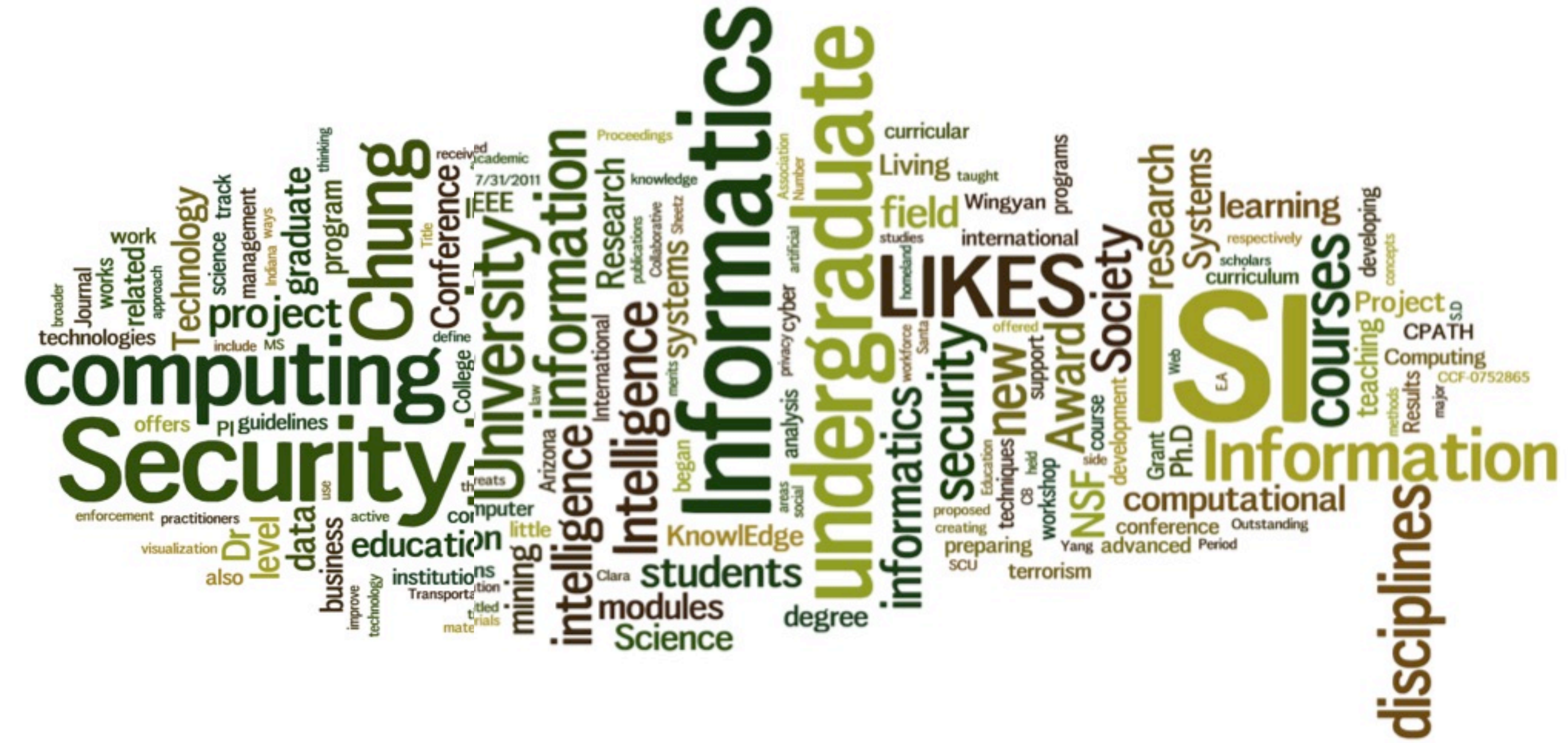

Intelligence and Security Informatics: Developing Curricular Modules in Context

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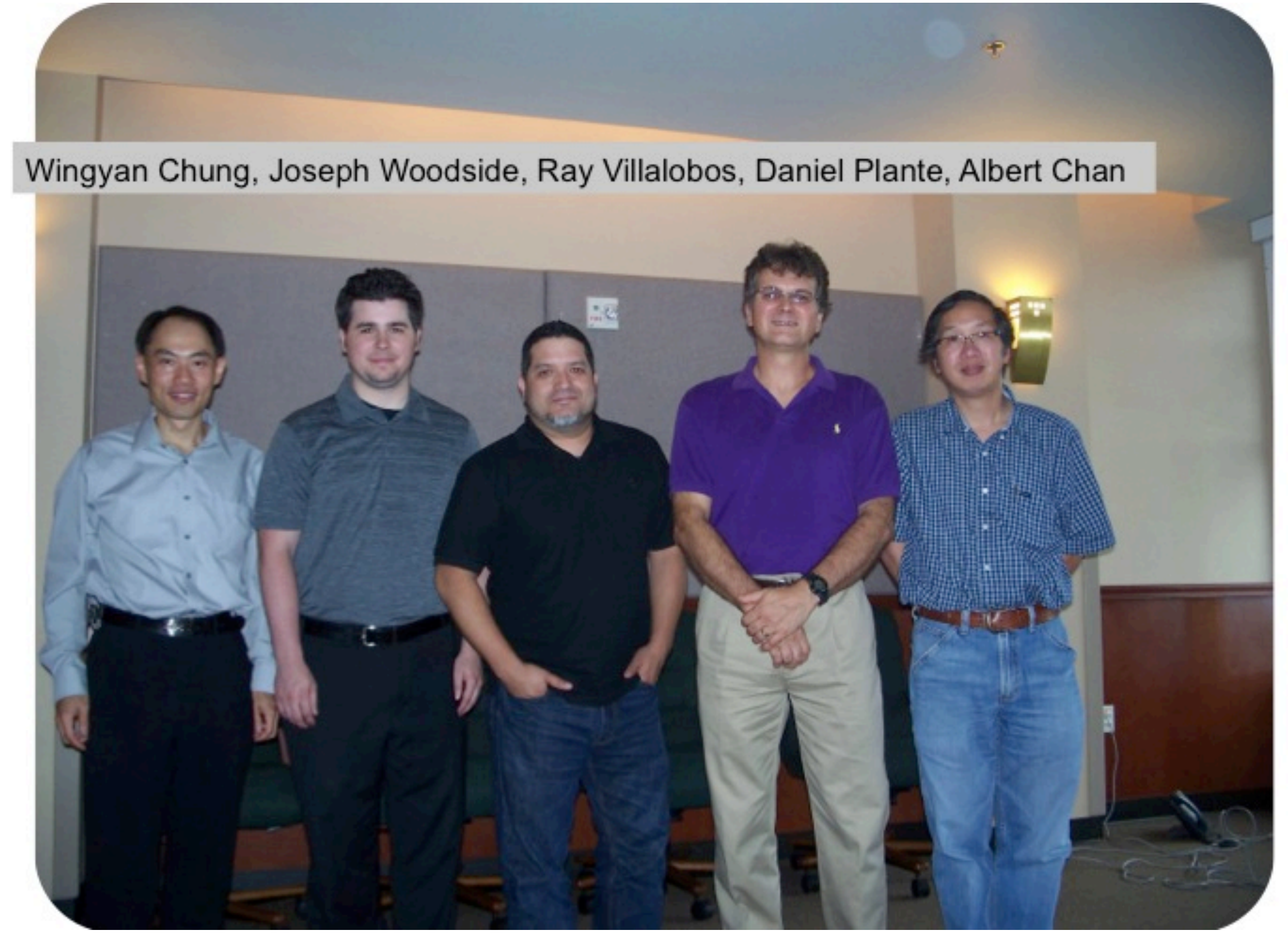
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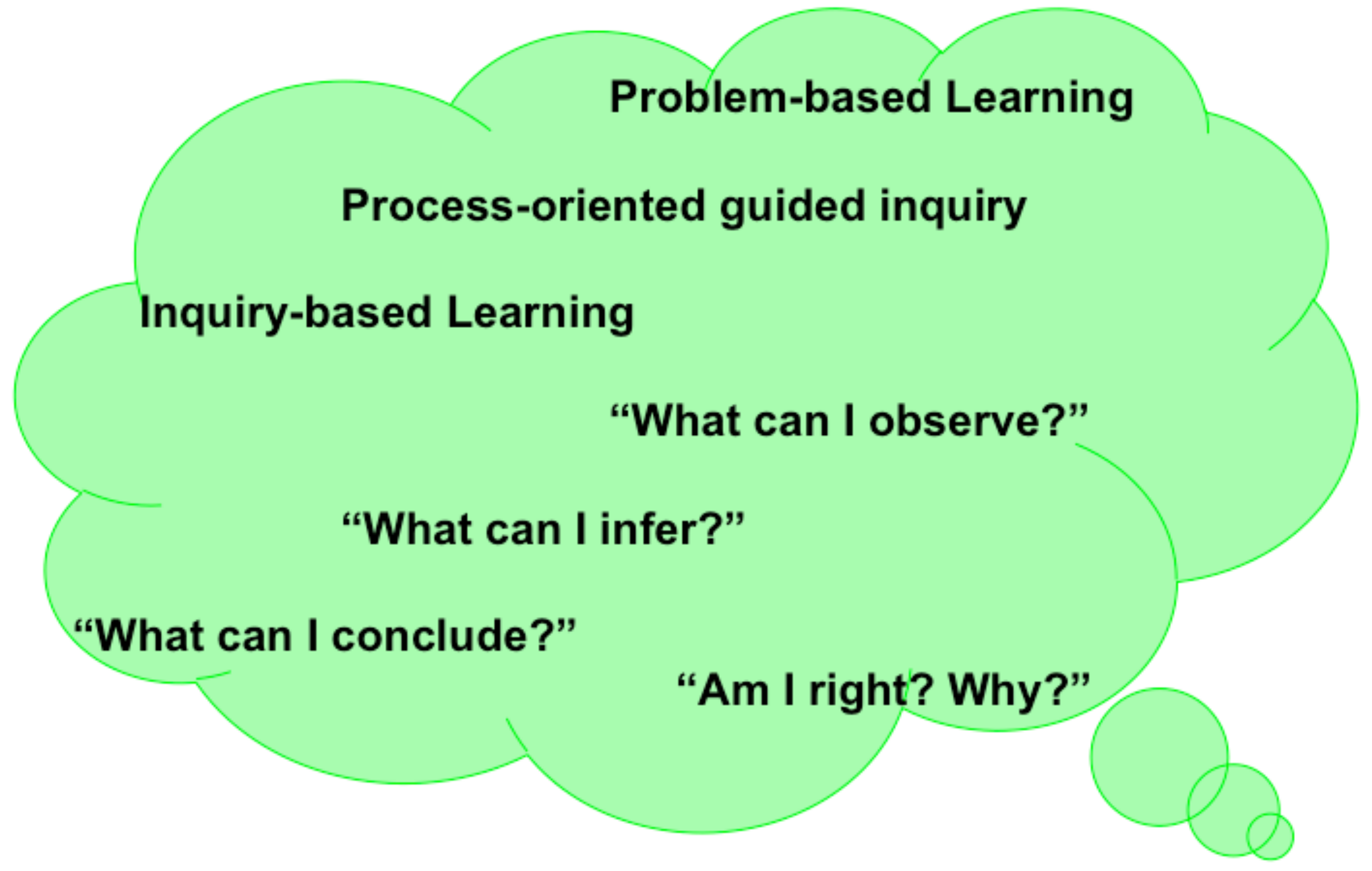
INTRODUCTION

Little work is found on preparing undergraduate students to enter the growing profession of intelligence and security informatics (ISI), a cross-disciplinary field defined as the development of advanced information technologies for security related applications, through an integrated technological, organizational, and policy-based approach. The "Computing in Context" project, funded by National Science Foundation (DUE-1141209), aims to develop, disseminate, and evaluate course materials and teaching modules that use active learning pedagogies and that put the learning of computing in real-world context. One of the project's sub-groups focuses on teaching modules and pedagogical development that use active-learning in an ISI context. Supported by the Center for Business Intelligence and Analytics at Stetson University (http://cbia.stetson.edu/cic), the group convened for its first workshop in August 2013 and developed five exemplar teaching modules.


Problem-based Learning

Process-oriented guided inquiry

Inquiry-based Learning

"What can I observe?"

"What can I infer?"

"What can I conclude?"

"Am I right? Why?"

Project Approach: Active Learning

MODULE: Database Design and Development for Cybercrime Investigation

Law enforcement agencies develop databases to support storage and access of data about cybercrime cases and suspects. In this module, students learn database design and development in the context of cybercrime investigation. Students learn about data structure in identifying cybercrime data attributes, collaborate in groups to define an entity relationship model, develop the database using a small-scale database management system, and create a professional presentation of the database. In-class discussions surrounding selection of database attributes and data structure, creation of attribute relationship, and effective communication of the end product serve to engage students in active learning. We assess the module effectiveness by measuring students' performance in the exercises.

MODULE: Securing Private Data on the Internet

Using online search tools, cybercriminals can write programs to scrape sensitive data (e.g., PDF or Excel files containing "ssn", "password") from targeted bank or company web sites. In this module, students learn to use PHP, Curl, and the Google Advanced Search API to scrape benign content from web pages (e.g., ISBN numbers from Amazon) to illustrate the methods. Students also will gain experience designing modular code and using Software-as-a-Service (SaaS) by accessing the RESTful search API. In-class activities involve programming such scrapers, discussing the ethics of acquiring data that is sensitive and unintentionally made public, and company policies and training that can help prevent such problems. Module assessment will focus on students' acquisition of skill and knowledge.

MODULE: Using Data Visualization to Understand Privacy Sentiment

To understand the effect and the moods, sentiments and trends of online privacy, the students can use open source and readily available tools to map out this data in a visual format. In this module, the students will learn how to read, parse and visualize data from twitter that is related to privacy information and moods. They will use modern visualization tools such as Gephi and the d3 JavaScript library to create dynamic visualization of sentiment data related to privacy and security. The module will be implemented in a computer science class in which we will assess the module by a survey.

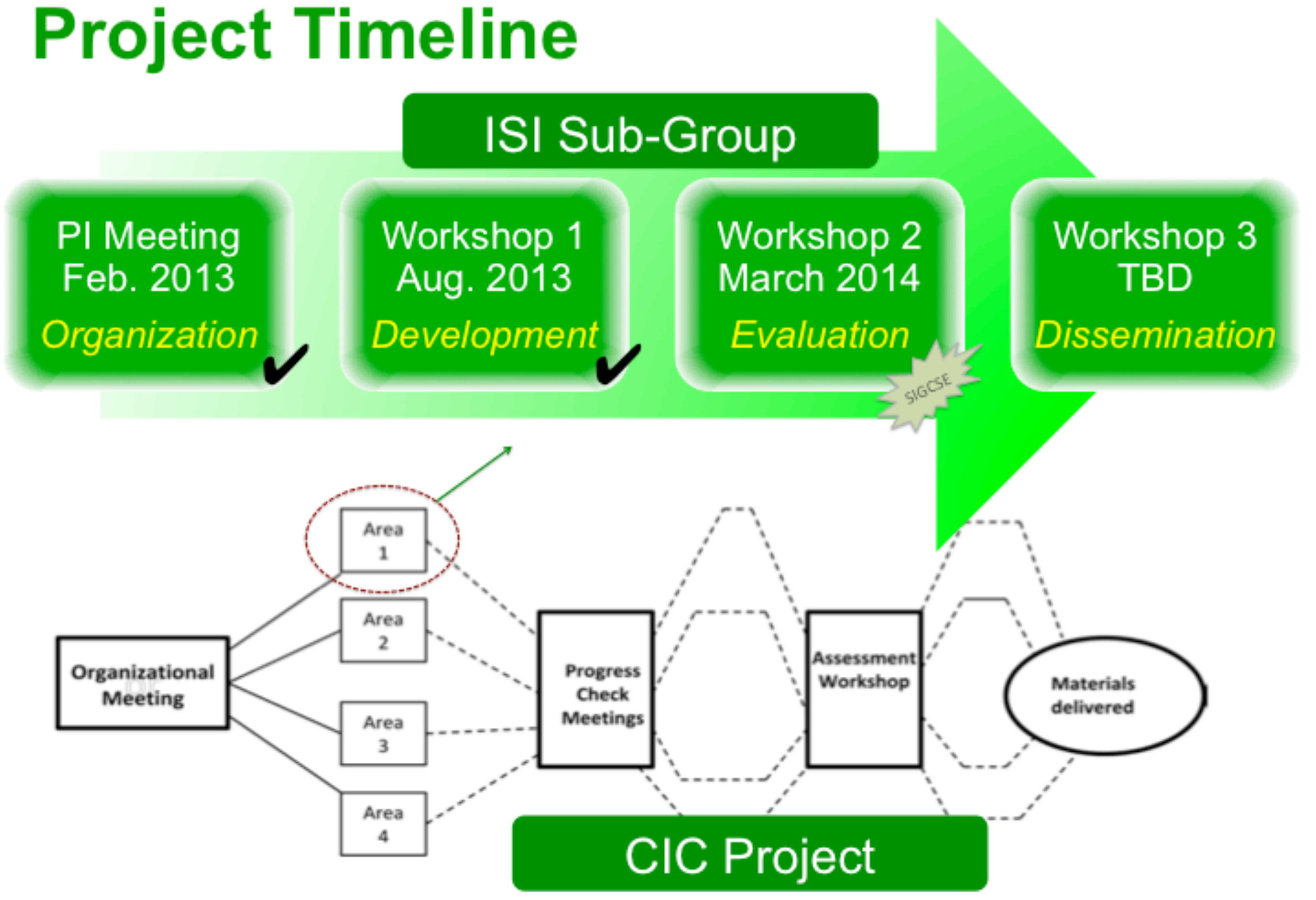
MODULE: Mobile Security Intelligence

Mobility of computing devices can invite unwanted access to such private data as contacts, texts, calls, email, calendars, internal systems, credit card information, and personal data. Increases in breaches can be tied to regulation requirements, automation increases, social media development, and human errors. This module and associated learning outcomes include risk, event, use monitoring, and security analysis. In an applied activity, students collaborate in groups to solve security issues with bring your own device (BYOD) in business and present their findings and receive feedback through classroom discussions.

MODULE: Computer Program Design and Development for Digital Forensics

Digital forensics professionals often need specific software tools to support investigation. This module targets students taking a second-semester programming course (traditionally known as CS2). We introduce a scenario of digital forensics and designed a series of labs to guide students through all stages of object-oriented programming design and development. Deployed as in-class activities, the labs cover such topics as using objects, creating classes, text files handling, inheritance, data structures, and recursion. A submission mechanism will be provided to track students' participation to support statistical analysis of the labs' effectiveness. We have deployed some of the labs to a CS2 class and will use the students' final grade in the course to evaluate the module.

Project Timeline


ISI Sub-Group

PI Meeting
Feb. 2013
Organization ✓

Workshop 1
Aug. 2013
Development ✓

Workshop 2
March 2014
Evaluation

Workshop 3
TBD
Dissemination

CIC Project

We Need Your Help!!

Module Implementation – Need undergraduate classes for implementing the developed modules.

Module Evaluation – Need undergraduate classes to serve as subjects for evaluating developed modules.

Module Dissemination – Need to disseminate the developed modules to different universities.

Please contact us:

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