"Computing in Context" Workshop on Intelligence and Security Informatics Curricular Module Development

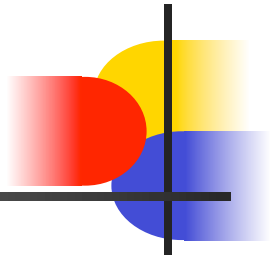
August 6, 2013

http://stetson.us.to/cic

STETSON UNIVERSITY
School of Business Administration
Center for Business Intelligence and Analytics

Work supported by the NSF under Grants Nos. DUE-1141209 and by Stetson University. Findings, conclusions, or recommendations expressed are those of the authors and do not necessarily reflect NSF's views.

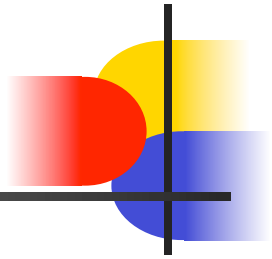
Workshop Participants



- Albert Chan, Fayetteville State U.
- Wingyan Chung, Stetson University, BIA
- Daniel Plante, Stetson U., Comp. Sci.
- Ray Villalobos, Seminole St. College / Lynda.com
- Joe Woodside, Stetson University, BIA

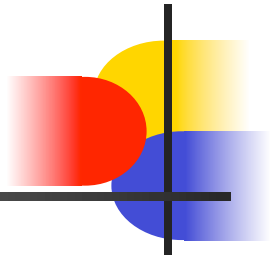
Thank you!

Agenda



- Introduction
- The CiC Project Workshop: ISI
  - ISI Teaching Modules
    - Development
    - Implementation
    - Module Evaluation
  - Workshop Logistics
- Ongoing and Future Works

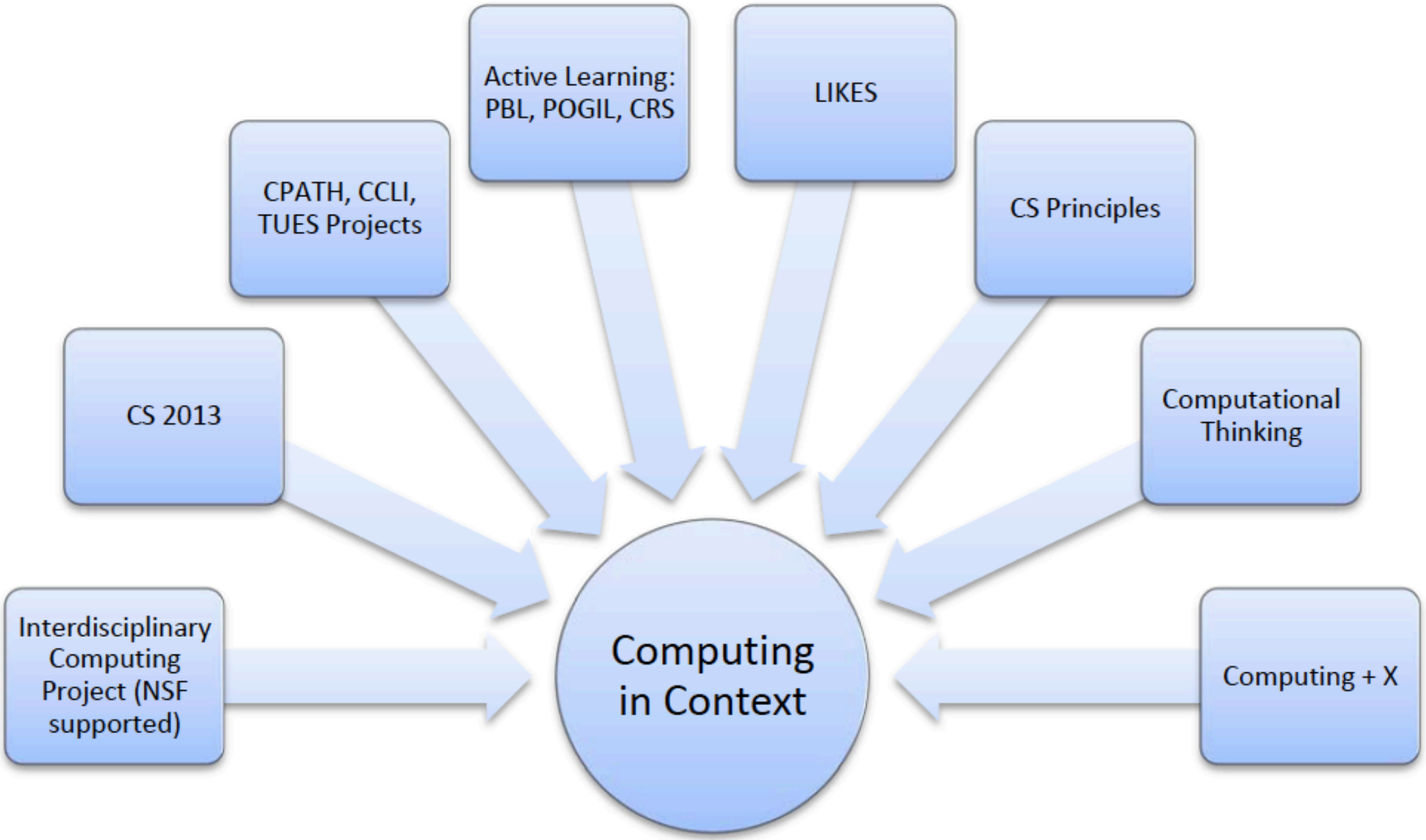
Background



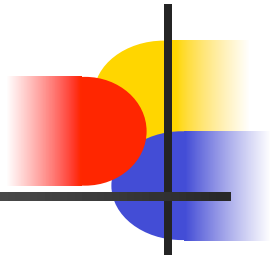
- Enrollment, Diversity, Undergraduate Program, Myths
- Students need to learn appropriate concepts in computing and apply them in other fields
- We focus on breadth of relationships between computing and other disciplines
- Methods: Active learning, problem-based learning, process-oriented guided inquiry

Computing in Context Project

- Collaboration among 4 institutions
  - Villanova, VT, NCAT, Stetson
  - Project span: Aug. 2012 – Jul. 2014
- History
  - LIKES Project (2007-2011)
  - NSF TUES
- Current Project Areas
  - Computational Linguistics, Computing and Music, ISI, Web Science

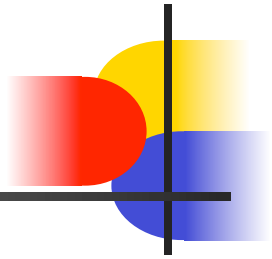

Active Learning: PBL, POGIL, CRS
LIKES
CPATH, CCLI, TUES Projects
CS Principles
CS 2013
Computational Thinking
Interdisciplinary Computing Project (NSF supported)
Computing in Context
Computing + X

Project Goal



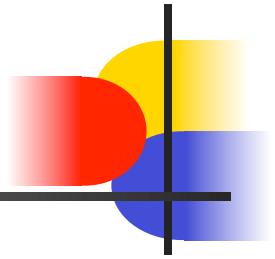
- To develop, evaluate, and disseminate course materials and teaching modules that use active learning pedagogies and that weave ideas of computing together with ideas from the ISI discipline
  - Course materials and teaching modules
  - Active learning
  - Ideas of computing
  - ISI discipline

Some terms



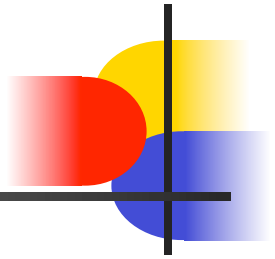
- Active learning
  - Problem-based learning, process-oriented guided inquiry, inquiry based learning
  - "What can I observe/infer/conclude? Am I right? Why?"
- Ideas of computing
  - Data / information / knowledge
  - Algorithm & Problem Solving
  - Graphics & Visualization
  - Modeling & Simulation

Intelligence and Security Informatics (ISI)



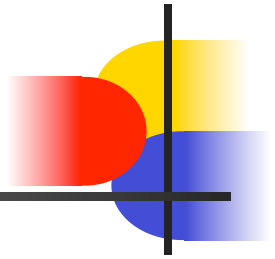
- A cross-disciplinary field with many stakeholders
  - Researchers in IT, CS, public policy, bioinformatics, behavioral studies
  - Law enforcement agencies, IT consultants and practitioners
  - Supports counterterrorism and homeland security missions of anticipation, interdiction, prevention, preparedness and response to terrorist acts.

ISI Defined



- Definition (ISIConference2013.org)
  - The development of advanced IT, systems, algorithms, and databases for international, national and homeland security related applications, through an integrated technological, organizational, and policy-based approach
- Relationship with CS / IS
  - AI, ML, data/text/web mining
  - Database systems, big data
  - Computational linguistics
  - Risk management
- IEEE ISI annual conference began in 2003

Educational Development



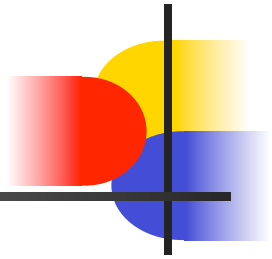
- "Web computing" – University of Arizona
  - Security informatics
- M.S. in Security Informatics – Indiana University, School of Informatics and Computing
  - Also has security informatics track in PhD program
- SI Track in PhD program, Penn State U, College of IST
  - Cyber security
- M.S. Course in ISI, U. Abertay Dundee (UK)

  - Most programs / courses are at graduate level. Little work found on preparing UG students for ISI field.

ISI in the CiC Project: Tasks

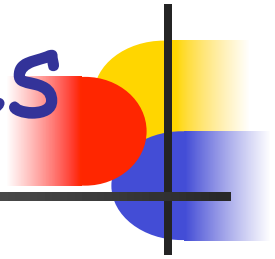
- To develop new problem-based teaching modules, curricular guidelines, and materials in ISI at UG level
- To implement the modules at UG courses
- To evaluate impact of the use of the modules
- To disseminate the modules, guidelines, and materials widely for instructor use

Module Development



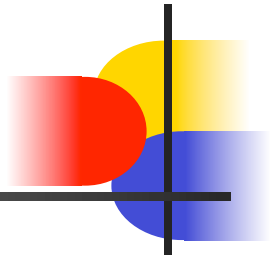
- Module
  - An independent session of learning
  - Consists of goal, motivation, body of knowledge, exercise, and evaluation
- Module usually contains a context
  - E.g., cyber crime investigation, security analysis

Workshop 1: Possible Outcomes



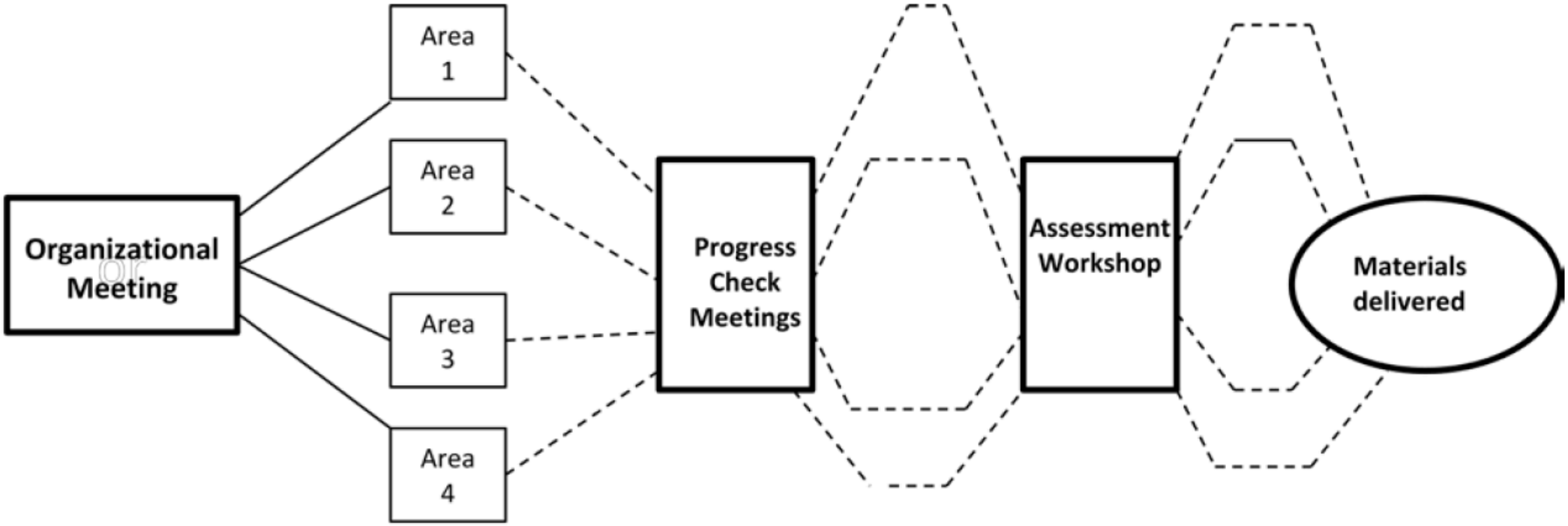
- New modules developed, implemented, and evaluated by participants
  - Peer implementation / review
- Documenting experience gained
  - Summarizing guidelines and principles
  - Publications in conferences and journals
- New collaborations
  - Grant / research / outreach efforts

Workshop Logistics



- Reimbursement
  - Travel, subsistence
  - Honorarium ($500)
- Future meetings
  - TBD
  - Teleconferencing
  - Face-to-face
- Communication

Tentative Timeline



Feb. 2013

Summer 2013

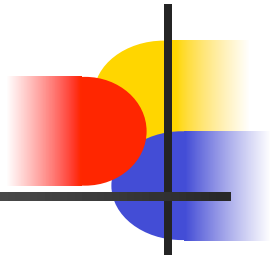
* Dec. 13 – Mar. 2014

* Apr - Jun. 2014

* Jul. 2014

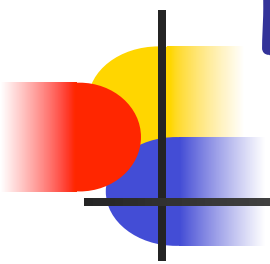
* Tentative

This Workshop's Schedule

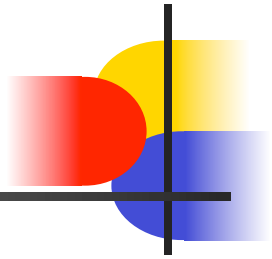


- Morning
  - Presentation of Module Development
- Afternoon Discussion
  - ISI Curriculum
  - Additional Modules and Structure
  - Synergy of efforts
  - Cross pollination of ideas
  - Next steps

Module: Cybercrime Investigation Database Development

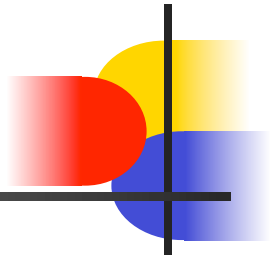


Sample Modules (1)



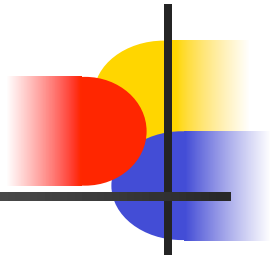
- Creating and Formatting a Spreadsheet
  - Team work: Creating an Excel spreadsheet for cyber crime investigation
  - BOK: data type, usage in Excel
  - Ex: Book - Excel Tutorial 1
- Using Functions in a Spreadsheet
  - BOK: representation of formula, computation with formula
  - Video: Excel function
  - Ex: Book – Excel Tutorial 2

Sample Module (2)



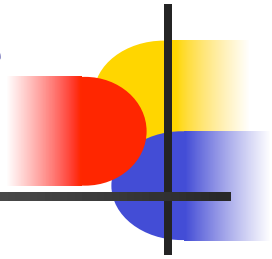
- Designing a Database
  - Teamwork: Listing the entity types and fields for a cyber crime investigation DB
  - Video: DB design in MS Access
  - BOK: data type used in DB, field design, MS Access table creation
  - Ex.: Book - Access Tutorial 1

Evaluation of Learning



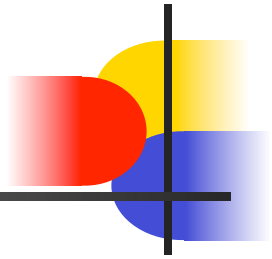
- SAM 2010 Portal
  - http://www.cengage.com/samcentral/
  - A commercial website associated with the textbook
  - Provide strong support
    - http://cengage.com/coursecare/
  - Each student buys a license to access the portal
  - Automated grading of student submission (Word, Excel, Access, PowerPoint)

Implementation of Modules



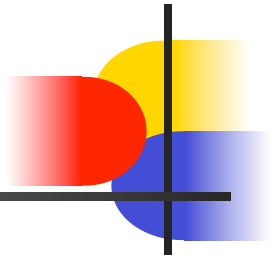
- "Microcomputer Applications in Business," Spring 2013
  - A freshman / sophomore course
- Cyber crime investigation support is a theme used in the module development
- Video, group activities, textbook tutorials, and exercises were used
- Evaluation of learning done in SAM portal

Module Evaluation Plan



- Student learning outcomes
- Student feedback
  - Helpfulness of modules
  - Connection with BOK
  - Satisfaction
- Instructor feedback
- Community feedback

Ongoing and Future Works



- Module Packaging
- Organizing and disseminating modules
- Evaluating modules
- Community adoption