SFS Spring Meeting at UMBC

An Informal and Off-the-Record Discussion with
Rob O’Connor, Chief Information Officer, Baltimore County Government and
Oliver Pandian, Baltimore County’s Senior Security Network Engineer

9am-1pm, Friday, May 24, 2019

ITE Building, Room 456
University of Maryland, Baltimore County
1000 Hilltop Circle, Baltimore, Maryland 21250

Open to the public

Learn about how Baltimore County secures its computer systems and networks and how it deals with cybersecurity threats. Also, Scholarship for Service (SFS) students from Montgomery College (MC) and Prince George’s Community College (PGCC) will present their results solving IT security problems for their universities, county governments, and local companies. This activity is part of a pioneering program centered at UMBC to extend SFS scholarships to community college students. In January 2019, all SFS scholars at UMBC, PGCC, and MC worked collaboratively to analyze the security of UMBC’s system for delivering student web pages.

Agenda

9:00-9:15am Meet and talk with SFS students and faculty
9:15 Introductions: Alan T. Sherman (UMBC), Casey W. O’Brien (PGCC)
9:30-10:00am Investigating Crowdsourcing to Generate Distractors for Multiple-Choice Assessments
Travis Scheponik, PhD student in computer science at UMBC
(Joint work with Enis Golaszewski, Geoffrey Herman, Spencer Offenberger, Linda Oliva, Peter Peterson and Alan Sherman) - [remote presentation]
10:00-11:00 Securing Baltimore County’s Computer Systems – An informal discussion with
Rob O’Connor, Chief Information Officer, Baltimore County Government
Oliver Pandian (UMBC graduate), Baltimore County’s Senior Security Network Engineer
11:00-11:15 Break
11:15-12:00noon Reports PGCC and MC, including from MC student Elias Enamorado helping county government
12:00noon-1:00pm Lunch
1pm Adjourn

Host: Alan T. Sherman, sherman@umbc.edu, www.cisa.umbc.edu

Alan T. Sherman is a professor of computer science and Director of the UMBC Center for Information Security and Assurance (CISA), which center is responsible for UMBC’s designation as a National Center of Academic Excellence in Cyber Defense Education and Cyber Defense Research.

Richard Forno is a senior lecturer and director of the UMBC Graduate Cybersecurity Program

Casey W. O’Brien is Executive Director and Principal Investigator of the National CyberWatch Center, Prince George’s Community College.

Joe Roundy is the Cybersecurity Program Manager at Montgomery College, Germantown.

Support for this event is provided in part by the National Science Foundation under SFS Grants 1241576 and 1753681.
Investigating Crowdsourcing to Generate Distractors for Multiple-Choice Assessments

Travis Scheponik,† Enis Golaszewski,† Geoffrey Herman,‡ Spencer Offenberger,¶
Linda Oliva,¶ Peter A. H. Peterson,¶ Alan T. Sherman†

Abstract.

We present and analyze results from a pilot study that explores how crowdsourcing can be used in the process of generating distractors (incorrect answer choices) in multiple-choice concept inventories (conceptual tests of understanding). To our knowledge, we are the first to propose and study this approach. Using Amazon Mechanical Turk, we collected approximately 180 open-ended responses to several question stems from the Cybersecurity Concept Inventory of the CATS Project and from the Digital Logic Concept Inventory. We generated candidate distractors by filtering responses, grouping similar responses, selecting the four most frequent groups, and refining a representative distractor for each of these groups.

We analyzed our data in two ways. First, we compared the responses and resulting distractors with those from the aforementioned inventories. Second, we obtained feedback from Mechanical Turk on the resulting new draft test items (including distractors) from additional subjects. Challenges in using crowdsourcing include controlling the selection of subjects and filtering out responses that do not reflect a genuine effort. Despite these challenges, our results suggest that crowdsourcing can be a very useful tool in generating effective distractors (attractive to subjects who do not understand the targeted concept). Our results also suggest that this method is faster, easier, cheaper, and more efficient than is the traditional method of having one or more experts draft distractors, building on talk-aloud interviews with subjects to uncover their misconceptions. Our results are significant because generating effective distractors is one of the most difficult steps in creating multiple-choice assessments.

Paper to appear in the proceedings of the 2019 National Cyber Summit, June 4-6, in Huntsville, Alabama.

† Cyber Defense Lab, Department of Computer Science and Electrical Engineering, University of Maryland, Baltimore County (UMBC) - {tschepl,golaszewski, sherman}@umbc.edu
‡ Department of Computer Science, University of Illinois at Urbana-Champaign - {glherman,so10}@illinois.edu
¶ Department of Education, UMBC – oliva@umbc.edu
¶ Department of Computer Science, University of Minnesota Duluth - pahp@d.umn.edu