



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Abstract Book

14th Annual International Conference on
**Information Technology &
Computer Science**
21-24 May 2018, Athens, Greece

Edited by
Gregory T. Papanikos

2018

Abstracts
14th Annual International
Conference on
Information Technology &
Computer Science
21-24 May 2018
Athens, Greece

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TABLE OF CONTENTS

(In Alphabetical Order by Author's Family name)

Preface		7
Organizing Committee		8
Conference Program		9
1.	Computational Thinking, Computer Science, and Mathematics: Mathematics Students Engage in Programming <i>Bailey Braaten, Robert MacConnell & Arnulfo Perez</i>	12
2.	An Exploratory Study of the Role of the Human Resource Information System Professional <i>Sapora Bradley</i>	13
3.	A Theoretical Concept of an in-Memory Database Especially for IoT Sensor Data <i>Marina Burdack, Manfred Rössle & René Kübler</i>	15
4.	The Importance of Pronouncing Student's Name Right: SayitRight or SayMyNameRight using Smartphone APPS <i>Elizabeth Diaz</i>	16
5.	Interacting with Intelligent Assistants to Predict Consumer Satisfaction <i>Rashmi G. Elera & D.C. Grant</i>	18
6.	Antecedents of Teachers' Organizational Citizenship Behavior for ICT in Teaching and Their Improvement Efforts <i>Eyvind Elstad</i>	19
7.	On the Democratization of IoT Applications using Intelligent Infrastructure <i>Opher Etzion</i>	20
8.	Computer Science and Digitalization <i>Thomas Fehlmann</i>	21
9.	Supporting Enterprise Business Analytics with Collaborative Learning <i>Biswadip Ghosh</i>	22
10.	Understanding Former Drive Load in Paper Machines by using Big Data Techniques <i>Till Haenisch</i>	24
11.	Virtual Reality Technology in the Teaching of History <i>Regina Heidrich</i>	25
12.	A Focus on Legal-Technical Components of the Political Dimension of Globality <i>William Kapakos, Barbara Jo White, Lorrie Willey & Janet Ford</i>	26
13.	Image-based Malware Detection Using Convolutional Neural Networks <i>Christoph Karg</i>	28
14.	The Appropriate System to Support Decision Making in Medicine <i>Ana Ktona</i>	29
15.	Motion Sickness in VR Learning Environments <i>Carsten Lecon</i>	30

16.	Teacher Game Building: A Focus on Computational Thinking and Pedagogy <i>Qing Li</i>	31
17.	The Ethics of Care: Online Counsellor Support in Higher Education Using Advanced Technology <i>Helen Massfeller, Peter Hall & Rita Kop</i>	32
18.	Higher Music Education and Learning with Video Tutorials <i>Ari Poutiainen</i>	35
19.	FAST - FPGA-based Acceleration of Simulation Codes and Real-Time Models <i>Florian Pramme</i>	36
20.	Social Presence in Online Learning: Historical Perspectives with an Eye to the Future <i>Jennifer Richardson, Karen Swan, Patrick Lowenthal & Marcia Gentry</i>	38
21.	How Pinteresting: Investigating the Internalizing Disorders Content on Social Media <i>Alyssa San Jose</i>	40
22.	An Approach for the Automated Detection of XSS Vulnerabilities in Web Templates <i>Sebastian Stigler, Gulshat Karzhaubekova & Christoph Karg</i>	41
23.	Strategies for Online Learning Success <i>Susie Townsend</i>	42
24.	Social Media Usage between Faculty and Students and Its Implications on Policy Design <i>Christopher Weagle</i>	43

Preface

This book includes the abstracts of all the papers presented at the 14th *Annual International Conference on Information Technology & Computer Science (21-24 May 2018)*, organized by the Athens Institute for Education and Research (ATINER).

In total 24 papers were submitted by 30 presenters, coming from 10 different countries (Albania, Brazil, Canada, Finland, Germany, Israel, Norway, Switzerland, UAE & USA). The conference was organized into 8 sessions that included a variety of topic areas such as computer security, internet of things, business analytics and more. A full conference program can be found before the relevant abstracts. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which to discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet to exchange ideas on their research and consider the future developments of their fields of study.

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world regularly meet to discuss the developments of their discipline and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published nearly 200 books. Academically, the institute is organized into seven research divisions and 37 research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of ATINER for putting this conference and its subsequent publications together. Specific individuals are listed on the following page.

Gregory T. Papanikos
President

**14th Annual International Conference on Information
Technology & Computer Science
21-24 May 2018, Athens, Greece
Organizing and Academic Committee**

ATINER's conferences are small events which serve the mission of the association under the guidance of its Academic Committee which sets the policies. In addition, each conference has its own academic committee. Members of the committee include all those who have evaluated the abstract-paper submissions and have chaired the sessions of the conference. The members of the **academic committee** of the 14th Annual International Conference on Information Technology & Computer Science were the following:

1. Gregory T. Papanikos, President, ATINER.
2. Nicholas Pappas, Vice President of Academic Membership, ATINER & Professor of History, Sam Houston University, USA.
3. Panagiotis Petratos, Vice-President of Information Communications Technology, ATINER & Fellow, Institution of Engineering and Technology & Professor, Department of Computer Information Systems, California State University, Stanislaus, USA.
4. Sotirios Skevoulis, Academic Member, ATINER & Professor & Chair of Software Engineering, Pace University, USA.
5. Till Haenisch, Academic Member, ATINER & Professor, BW State University, Heidenheim, Germany.
6. Carsten Lecon, Professor, Aalen University of Applied Sciences, Germany.
7. Christoph Karg, Professor, Aalen University of Applied Sciences, Germany.
8. Opher Etzion, Professor and Department Chair, Information Systems, Max Stern Yezreel Valley College, Israel.
9. Thomas Fehlmann, Academic Member, ATINER & Senior Researcher, Euro Project Office AG, Switzerland.
10. Sabora Bradley, Academic Member, ATINER & Researcher, Pepperdine University, USA.
11. Jeril Kuriakose, Senior Software Engineer, Artificial Intelligence and Machine Learning, RawData Technologies Pvt. Ltd., India.

The **organizing committee** of the conference included the following:

1. Fani Balaska, Research Assistant, ATINER.
2. Olga Gkounta, Researcher, ATINER.
3. Hannah Howard, Research Assistant, ATINER.
4. Despina Katzoli, Researcher, ATINER.
5. Eirini Lentzou, Administrative Assistant, ATINER.
6. Konstantinos Manolidis, Administrator, ATINER.
7. Kostas Spyropoulos, Administrator, ATINER.

FINAL CONFERENCE PROGRAM
**14th Annual International Conference on Information Technology &
Computer Science**
21-24 May 2018, Athens, Greece

PROGRAM

Conference Venue: Titania Hotel, 52 Panepistimiou Street, 10678 Athens, Greece

Monday 21 May 2018

08:00-09:00 Registration and Refreshments

09:00-09:45 Welcome and Opening Address (Room E - Mezzanine Floor)

Gregory T. Papanikos, President, ATINER.
**Nicholas Pappas, Vice President of Academic Membership, ATINER & Professor of
History, Sam Houston University, USA.**

**09:45-11:30 Session I (Room E - Mezzanine Floor): Computer Science and Information Systems
Education***

Chair: Panagiotis Petratos, Vice-President of Information Communications Technology,
ATINER & Fellow, Institution of Engineering and Technology & Professor, Department of
Computer Information Systems, California State University, Stanislaus, USA.

1. *Qing Li, Professor, Towson University, USA. Teacher Game Building: A Focus on Computational Thinking and Pedagogy.
2. Regina Heidrich, Professor and Researcher, Feevale University, Brazil. Virtual Reality Technology in the Teaching of History.
3. *Bailey Braaten, PhD Graduate Student, The Ohio State University, USA, *Robert MacConnell, Mathematics Teacher, South-Western City Schools, USA & Arnulfo Perez, Assistant Professor, The Ohio State University, USA. Computational Thinking, Computer Science, and Mathematics: Mathematics Students Engage in Programming.

**This session is jointly offered with the Education Unit*

11:30-13:00 Session II (Room E - Mezzanine Floor): Internet & Social Media

Chair: *Sotirios Skevoullis, Professor & Chair of Software Engineering, Pace University, USA.

1. Susie Townsend, Professor, Northern Arizona University, USA. Strategies for Online Learning Success.
2. Christopher Weagle, Instructor, American University of Sharjah, UAE. Social Media Usage between Faculty and Students and Its Implications on Policy Design.
3. Alyssa San Jose, PhD Candidate, The Pennsylvania State University, USA. How Pinteresting: Investigating the Internalizing Disorders Content on Social Media.

**This session is jointly offered with the Education Unit*

13:00-14:30 Session III (Room E - Mezzanine Floor): Internet of Things

Chair: *Till Haenisch, Professor, BW State University, Heidenheim, Germany.

1. *Opher Etzion, Professor and Department Chair, Information Systems, Max Stern Yezreel Valley College, Israel. On the Democratization of IoT Applications using Intelligent Infrastructure.
2. Sebastian Stigler, Aalen University of Applied Sciences, Germany, Gulshat Karzhaubekova, Research Fellow, Aalen University of Applied Sciences, Germany & Christoph Karg, Professor, Aalen University of Applied Sciences, Germany. An Approach for the Automated Detection of XSS Vulnerabilities in Web Templates.
3. Marina Burdack, Research Fellow, Aalen University of Applied Sciences, Germany, Manfred Rössle, Professor, Aalen University of Applied Sciences, Germany & René Kübler, Software Developer, Oskar Frech GmbH + Co. KG, Germany. A Theoretical Concept of an in-Memory Database Especially for IoT Sensor Data.
4. Rashmi G. Elera, Student, University of Washington, USA & D.C. Grant, Lecturer, University of Washington, USA. Interacting with Intelligent Assistants to Predict Consumer Satisfaction.

14:30-15:30 Lunch

15:30-17:00 Session IV (Room E - Mezzanine Floor): Business Analytics

Chair: Thomas Fehlmann, Senior Researcher, Euro Project Office AG, Switzerland.

1. *Till Haenisch, Professor, BW State University, Heidenheim, Germany. Understanding Former Drive Load in Paper Machines by using Big Data Techniques.
2. Biswadip Ghosh, Associate Professor, Metropolitan State University of Denver, USA. Supporting Enterprise Business Analytics with Collaborative Learning.
3. Sabora Bradley, Researcher, Pepperdine University, USA. An Exploratory Study of the Role of the Human Resource Information System Professional.

17:00-18:30 Session V (Room E - Mezzanine Floor): Computer Science

Chair: Carsten Lecon, Professor, Aalen University of Applied Sciences, Germany.

1. Thomas Fehlmann, Senior Researcher, Euro Project Office AG, Switzerland. Computer Science and Digitalization.
2. Florian Pramme, Research Assistant / PhD Student, Ostfalia University of Applied Sciences / Clausthal University of Technology, Germany. FAST – FPGA-based Acceleration of Simulation Codes and Real-Time Models.

21:00-23:00 Greek Night and Dinner

Tuesday 22 May 2018

07:45-11:00 Session VI: An Educational Urban Walk in Modern and Ancient Athens

Chair: Gregory A. Katsas, Vice President of Academic Affairs, ATINER & Associate Professor, The American College of Greece-Deree College, Greece.

Group Discussion on Ancient and Modern Athens.
Visit to the Most Important Historical and Cultural Monuments of the City (be prepared to walk and talk as in the ancient peripatetic school of Aristotle)

11:15-13:00 Session VII (Room D - 10th Floor): Information and Communication Technology in Education*

Chair: *Christoph Karg, Professor, Aalen University of Applied Sciences, Germany.

1. Jennifer Richardson, Professor, Purdue University, USA, Karen Swan, Professor, University of Illinois Springfield, USA, Patrick Lowenthal, Associate Professor, Boise State University, USA & Marcia Gentry, Professor, Purdue University, USA. Social Presence in Online Learning: Historical Perspectives with an Eye to the Future.
2. Helen Massfeller, Associate Professor, University of New Brunswick, Canada & Rita Kop, Associate Dean, Faculty of Education, Yorkville University, Canada, Peter Hall, Dean, Faculty of Behavioural Sciences, Yorkville University, Canada. The Ethics of Care: Online Counsellor Support in Higher Education Using Advanced Technology.
3. Eyvind Elstad, Professor, University of Oslo, Norway. Antecedents of Teachers' Organizational Citizenship Behavior for ICT in Teaching and Their Improvement Efforts.
4. Ari Poutiainen, Associate Professor, University of Helsinki, Finland. Higher Music Education and Learning with Video Tutorials.
5. *Elizabeth Diaz, Senior Lecturer, University of Texas at Arlington, USA. The Importance of Pronouncing Student's Name Right: SayItRight or SayMyNameRight using Smartphone APPS.

**This session is jointly offered with the Education Unit*

13:00-14:00 Lunch

14:00-15:30 Session VIII (Room D - 10th Floor): Information Assurance and Computer Security

Chair: *Opher Etzion, Professor and Department Chair, Information Systems, Max Stern Yezreel Valley College, Israel.

1. *Christoph Karg, Professor, Aalen University of Applied Sciences, Germany. Image-based Malware Detection Using Convolutional Neural Networks.
2. Carsten Lecon, Professor, Aalen University of Applied Sciences, Germany. Motion Sickness in VR Learning Environments.
3. William Kapakos, Assistant Professor, Western Carolina University, USA, Barbara Jo White, Professor, Western Carolina University, USA, Lorrie Willey, Associate Professor, Western Carolina University, USA & Janet Ford, Associate Professor, Western Carolina University, USA. A Focus on Legal-Technical Components of the Political Dimension of Globality.
4. Ana Ktona, Lecturer, Tirana University, Albania. Appropriate System to Support Decision Making in Medicine Area.

20:00- 21:30 Dinner

**Wednesday 23 May 2018
Mycenae and Island of Poros Visit
Educational Island Tour**

**Thursday 24 May 2018
Delphi Visit**

**Friday 25 May 2018
Ancient Corinth and Cape Sounion**

Bailey Braaten

PhD Graduate Student, The Ohio State University, USA

Robert MacConnell

Mathematics Teacher, South-Western City Schools, USA

&

Arnulfo Perez

Assistant Professor, The Ohio State University, USA

Computational Thinking, Computer Science, and Mathematics: Mathematics Students Engage in Programming

Our world has entered into an age in which technological skills are becoming essential to all careers. In order to prepare students to enter into this world, it is necessary to provide students with experiences to build technical skills within the classroom setting. Defined as a creative way to approach tasks or problems using concepts, practices, and perspectives from computer science, computational thinking holds promise for all levels of education, especially K-12 classrooms (Wing, 2008). Efforts to advance computational thinking (CT) in education include increased attention to the dispositions and practices commonly employed by computer scientists and how these same practices and dispositions can be introduced to students in K-12 classrooms (Weintrop et al., 2015).

This study investigated a lesson on computer programming and circuitry conducted in a middle school mathematics classroom. In the lesson students built a circuit with resistors and LEDs and connected the circuit to a microcontroller, which they programmed to turn the LEDs on and off in a sequence that mimics a traffic light. The lesson allowed students to engage in computational thinking strategies and extend their mathematics classroom experience into the realm of computer science.

Two mathematics students were the focus of this study, as they engaged in productive struggle to simulate a traffic light by programming a microcontroller connected to a circuit. These two students reflect two possibilities for how engaging in computational thinking practices and dispositions can provide important growth opportunities for students in mathematics. This study was conducted in a middle school mathematics classroom in the United States and focused on three days of instruction. The results that providing students with opportunities to engage in computation thinking can lead to growth in students' engagement with mathematics and can shape how they may approach STEM tasks in the future.

Sapora Bradley
Researcher, Pepperdine University, USA

An Exploratory Study of the Role of the Human Resource Information System Professional

The increasing implementation of technology applications into the workplace has substantiated the need for adept professionals who can manage HR technology for employees and provide data about the organization. For some companies, these professionals are found within the human resources department. These information systems professionals combine HR knowledge and technology skills to procure applications that improve work processes and HR outcomes.

This qualitative study focused on exploring the role delineation of human resource information systems (HRIS) professionals to better understand the advantageous aspects of the role's focus in HR technology and analytics. Specifically, the study aimed to describe how the HRIS professional role supports the functions of HR and transformation of HR activities within organizations. Additionally, the research sought to uncover how HRIS professionals described their responsibilities and competencies in response to the significance of data analytics, as well as how the HRIS professionals described the outlook of their professional role.

Ten, semi-structured interviews were conducted with HRIS professionals who reported having progressive HRIS experience within U.S. based organizations. The results included HRIS professionals' beliefs about their tasks, competencies, and job outlook and thematic analysis resulted in six categories (a) data management, (b) HR/IT intersection, (c) HRIS emergence, (d) business intelligence, (e) professional identity, and (f) job satisfaction. The conclusions drawn from the research findings indicated that (a) HRIS professionals encourage HR technology integration to improve workplace processes, (b) HRIS professionals manage data integrity and support the safeguarding of employee information, (c) HRIS professionals run data inquiries and provide reports that influence decision making related to workforce and business outcomes, (d) and HRIS professionals are enthusiastic about emergent job responsibilities in the design and coding of systems.

Recommendations for practice include executive consideration toward improving the visibility of HRIS contributions as a way of strengthening relationships between HRIS professionals and the stakeholders they support. Recommendations also include further investigation into the utilization of analytics in the workplace. This study contributes to the existing literature by providing insight into the opinions of HRIS professionals about their role and interactions within their organizations

and recognizes that HRIS professionals consider both people and data when it comes to HR technology implementation.

Marina Burdack

Research Fellow, Aalen University of Applied Sciences, Germany

Manfred Rössle

Professor, Aalen University of Applied Sciences, Germany

&

René Kübler

Software Developer, Oskar Frech GmbH + Co. KG, Germany

A Theoretical Concept of an in-Memory Database Especially for IoT Sensor Data

In the context of the digital transformation and the use of Industry 4.0 technology in companies, machines/objects are increasingly being equipped with sensors to monitor, for example, the production process or the individual machine. As part of the Internet of Things these machines are being additionally connected with the internet, to communicate with them for example by Smartphone/ tablet. But the most valuable treasure is the data stream, which is continuously collected by the sensors. From this data stream knowledge can be generated by the use of machine learning algorithms. This knowledge can be lead, for example, to an improvement of the production process.

But before machine learning algorithms can generate knowledge from the data, they need a database where the raw data of the sensors are stored. These raw data have typical structures that are difficult to model with traditional database management systems. Here, the so-called In-Memory databases are better suited. However, these were not been developed to store sensor data, so that they contain components, which are unnecessary for the named range of application. By reducing this concept to the essentials, a specialized, lightweight In-Memory database management system can be developed, which is perfectly matched to the characteristics of time series sensor data.

Elizabeth Diaz

Senior Lecturer, University of Texas at Arlington, USA

The Importance of Pronouncing Student's Name Right: SayitRight or SayMyNameRight using Smartphone APPS

A lot of research has been done about the importance of pronouncing students' names correctly – during attendance, a classroom activity, or any other time of the school day – should always be a priority for any classroom teacher. However, most of the research is about what we should do without providing a solution. Failure to pronounce a name correctly impacts the world view and social emotional well-being of students, which, of course, is linked to learning. This issue is considered a one of those “micro aggressions” , defined by researchers at Columbia University's Teachers College as “brief and commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward people of color” (Sue et al., 2007), that can emerge in a classroom and seriously undermine learning. Whether you intend to or not, what you're communicating is this: Your name is different. Foreign. Weird. It's not worth my time to get it right. Although most of your students may not know the word *micro aggression*, they're probably familiar with that vague feeling of marginalization, the message that everyone else is “normal,” and they are not.

“Names have incredible significance to families, with so much thought, meaning and culture woven into them,” Kohli says. “When the child enters school and teachers – consciously or not – mispronounce, disregard or change the name, they are in a sense disregarding the family and culture of the students as well.” “To fully accept and respect a student, you must at a minimum know how to pronounce their name. *When a teacher – consciously or not – mispronounces, disregards or changes the name, they are in a sense disregarding the family and culture of the students as well*”

“Students often felt shame, embarrassment and that their name was a burden,” Kohli says. “They often began to shy away from their language, culture and families.”

Kohli points out that most educators are not doing so out of disrespect, but tend to be confined by a monoculture viewpoint that makes it “more challenging to center cultures outside of their own.” Consequently, certain names sound unfamiliar and fall far outside their comfort zone.

Showing respect, however, doesn't necessarily require that an educator nails the pronunciation on the first attempt. “We can't say every

sound or name in the world, but it is how we respond that matters," says Kohli.

"Mutilating someone's name is a tiny act of bigotry." And Adam Levine-Peres, a teacher who created the online series "Project Bronx," suggests that mispronouncing a student's name fails to establish an environment of trust, sends the message that perseverance is not important, and communicates disrespect.

To make things worse is not just the pronunciation of the name but not knowing about your student's gender when you are looking at a roster and having to write an email.

In this paper, we present a tool to solve the issue with the name's pronunciation as well as the gender problem. This tool, SayitRight, shows you how to pronounce the student's name, how your student looks like. The tool helps teachers/instructors to pronounce names correctly. It also help students to identify who is sitting next to me.

Rashmi G. Elera
Student, University of Washington, USA
&
D.C. Grant
Lecturer, University of Washington, USA

Interacting with Intelligent Assistants to Predict Consumer Satisfaction

With the rise in popularity of intelligent assistants, there is an increasing need to understand and evaluate both strengths and shortcomings of the technology, in order to define specific areas for improvement and to understand where these interfaces are ideally suited. We describe the current state of personal digital assistants and evaluate performance by testing voice activated queries in four distinct categories including Translation, Current/Real Time Events, “How to” questions and General Knowledge. Experiments show that Microsoft’s Cortana beat the two competitors with an average accuracy of 87.5% of the questions answered followed by Amazon’s Alexa with an average accuracy of 72.5% and Apple’s Siri with only 33.75% accuracy. Siri was fastest to respond on the few questions it correctly answered, with an average speed of 0.84 seconds followed by Cortana with average speed of 1.3 seconds and Alexa at the average speed of 2.06 seconds. Cortana had the highest accuracy and overall effectiveness. Analysis of these three assistants illustrates the current ability of intelligent assistants to aid consumers. This work also demonstrates tremendous potential of voice activated interfaces in the future. Evaluating which category each assistant performed best (or worst) can be a strong predictor of user satisfaction; essential for the future development of effective intelligent assistants.

Eyvind Elstad

Professor, University of Oslo, Norway

Antecedents of Teachers' Organizational Citizenship Behavior for ICT in Teaching and Their Improvement Efforts

This study investigates organizational factors related to teachers' organizational citizenship behavior for ICT in teaching and their improvement efforts. The analysis is based on a sample of high school teachers working at schools characterized by near average intake points and value added measures. The method used is a cross-sectional analysis and structural equation modelling. We find that clear leadership is associated with teachers' organizational citizenship behavior for ICT in teaching. We find a weaker association between clear leadership and teachers' improvement efforts and a development-oriented school culture. Another finding is a weak, but negative association between development-oriented school culture and teachers' individual improvement efforts. We discuss this finding which clearly should be an avenue for further research. Relational trust among teachers is weakly associated with both organizational citizenship behavior and individual improvement efforts. But to a certain extent, there is a strong and a moderately strong association between clear leadership and development-oriented school culture on the one hand and clear leadership and organizational citizenship behavior on the other hand. These associations indicate that clear leadership is related to school development projects, relational trust among school professionals and organizational citizenship behavior, their improvement efforts, and development-oriented school culture. We find a very weak association between development-oriented school culture and organizational citizenship behavior. Implications for further research are discussed.

Opher Etzion

Professor and Department Chair, Information Systems, Max Stern Yezreel
Valley College, Israel

**On the Democratization of IoT Applications using Intelligent
Infrastructure**

The Internet of Things is an enabler to real-time analytics applications that are based on the 4D architecture: Detect, Derive, Decide, Do.

The Detect part detects the occurrence of an event of interest, the Derive part combines the event with other events and context information based on predefined patterns, or irregularity analysis to determine situations that require reaction (possibly in real-time), the Decide part decides on manual or autonomic reaction, and the Do part carries out the decision.

Currently, there are many applications that follow this paradigm, where the Detect part is based on sensors, and the Do part might employ actuators. These applications have various degrees of autonomy vs. user's control. The common denominator is that these applications are typically "turnkey systems", where the user have very little ability to control the logic of this application.

The trend of democratization materializes in the ability of the user to control the logic of an application, a physician will be able to control medical IoT based applications, an industrial engineer will be able to control industrial production oriented IoT based applications, and financial analyst will be able to control applications in that area. Furthermore, in a consumer-based market, such as IoT based applications for the elderly, it is vital to have highly personalized solutions whose logic can be controlled by the caretaker.

In the paper, we outline the 4D architecture and classify the different phases to sub-cases, based on the level of autonomy. For each sub-case we explore the strategy for democratization that involves two major components: programming ability for the user through high-level graphic abstractions, and intelligent component that bridges the gaps between the high level concepts and the actual implementable code, using both classic AI inferences, and learning abilities. The paper provides examples and roadmap for IoT applications.

Thomas Fehlmann

Senior Researcher, Euro Project Office AG, Switzerland

Computer Science and Digitalization

How does *Digitalization* affect Computer Science? What is its impact? Does it change the basics, or is “Digitalization” just another buzzword used to attract attention?

First, digitalization is a fact, describing a long-standing trend that for some time was hard to understand by people outside the ICT industry. It describes the growing possibilities to make physical “Things” intelligent, in the sense that they got cheap, little sensors for their physical environment, connect to the Internet, heavily depend on software for operations, and talk to cloud services collecting data, giving instructions and coordinate physical events.

The main change to computer science is that such software impacts the physical world directly, without a human intermediate. In the past, an engine driver got instructions from a software-based train control system and acted with discernment. Now, the software takes over train control and there is no human in between who is responsible for relevant events. Similar with cars, which in the past were equipped with navigation systems, and now the navigation system’s successors take over the steering wheel.

Among many other possible consequences, we remark that some international standards become obsolete. The ISO/IEC 25010:2011 quality attributes for software (*Systems and software Quality Requirements and Evaluation - SQuaRE*) are outdated, after only seven years. While *Security* is among the eight major quality attributes and *Privacy* is partly covered by *Confidentiality*, although those two are not the same, *Safety* is not even mentioned. This is a strong indication that computer science somewhat seems surprised by digitalization, and therefore strongly affected.

Digitalization causes products to become software-intense. This paper investigates the actual trends in product design and improvement. It proposes how to migrate the concepts of the past regarding software quality and quality measurement into the near future, where the software running the product needs to become safe, and safety needs to become measurable, such that consumers can take informed and responsible decisions. Also, privacy is put in jeopardy, much more than with traffic prediction systems that tracked our car’s navigator to predict traffic jams.

Biswadip Ghosh

Associate Professor, Metropolitan State University of Denver, USA

Supporting Enterprise Business Analytics with Collaborative Learning

With the growth of online enterprise data, enterprise-level business analytics (BA) tools have become an important option for manipulating large data sets during complex business decision making. However, the cross-functional nature of enterprise BA applications and enterprise data modelling makes usage among business end-users a challenge. The organizational benefits of enterprise BA applications can vary significantly depending on the level of training and insight of the business leaders, who are the ultimate stakeholders of the BA applications. There are three important goals of learning programs in BA: (1) skill-based goals that target the participant's ability to use the tools, (2) cognitive goals that focus on the use of the tools to solve business problems and (3) meta-cognitive goals that focus on building the participant's beliefs regarding their own abilities with the tools.

Typical BA training programs emphasize tool procedural or skill based knowledge and ignore items (2) and (3), which does not allow BA end users to achieve cognitive learning outcomes. Cognitive learning allows participants to understand the broader scope of enterprise analytics project implementations. However, such cognitive learning outcomes require pedagogical practices that can support collaboration among the end users during the learning process. Collaborative learning, which emphasizes the casual transfer of knowledge among groups of end users, blends the formal and informal learning phases and can provide deeper learning experiences that build cognitive learning outcomes. Social capital theory (SCT) is centrally concerned with the significance of relationships and its effect on group knowledge sharing. The concept of social capital comprises 3 dimensions - structural (network of interactions), relational (nature of cooperation), and cognitive (shared meaning of knowledge). Prior research has found a high correlation between social capital and knowledge sharing in group work settings. Therefore including practices to increase social capital among training participants can enhance the impact of collaborative learning on cognitive outcomes.

This research project adopts collaboration tools for a BA learning program that enhances the social capital among the participants, which leads to greater knowledge sharing and contributes to higher cognitive learning outcomes. The goals of this research project are to develop pedagogical practices and deploy collaboration tools for a collaborative BA learning program that can enhance the social capital of the participants. It is posited that this leads to greater knowledge sharing and

contributes to higher cognitive outcomes. The study proposes to use a field study to ascertain the benefits of collaboration in BA learning programs by building and validating a measurement model that links collaborative learning, group social capital, knowledge sharing and cognitive outcomes and using that model to measure cognitive outcomes of the participants.

Till Haenisch

Professor, BW State University, Heidenheim, Germany

Understanding Former Drive Load in Paper Machines by using Big Data Techniques

Optimizing energy consumption of a paper machine forming section in a systematic way requires detailed knowledge about exactly where the energy is consumed, that means converted into heat by friction between the moving forming fabric and static elements of the former. Since this is a large amount of energy in the order of megawatts that can be done by measuring temperature, consumption of energy leads to increased temperature of for example suction bars. Unfortunately it is difficult to measure these small temperature differences at these positions directly because of the unfriendly environment in a paper machine. One could mount a number of temperature sensors at different elements of the former but that would be very cost intensive. Compared with that, measuring wastewater temperature is simple and cheap but this temperature is influenced by many parameters of which energy consumption by friction of the fabric is only one. Using big data techniques, especially analyzing temperature differences in wastewater over an extended period of time, allows to better understand energy consumption in paper machine forming sections. This information can be used to optimize vacuum settings for the different suction boxes which leads to lower wear of forming fabrics and reduced former drive load.

Regina Heidrich

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Virtual Reality Technology in the Teaching of History

In Brazil, the percentage of Brazilians who have ever been to a museum is low (about 6%). Knowing the importance of visiting museums, especially during childhood, and the efficiency of the use of games in the education process, already proven by several authors, we tried to develop a game using virtual reality technology with the proposal to encourage students and visiting the Júlio de Castilhos Museum, located in the southern region of Brazil. The main objective of the project is to elaborate a playful script about the history of Rio Grande do Sul, to be applied in the educational game. To develop this research, we chose the case study, with a qualitative research approach. In the end, an experience in virtual reality was produced, starting at Praça da Matriz, located in Porto Alegre, capital of the state of Rio Grande do Sul. The participant is guided on a trip to the museum. Within the place, the player has the possibility to see and hear about some works, such as the missionary cross, used by the Jesuits as a symbol of faith, in which the two arms of the cross represent redoubled faith, focus and self-denial, and still today it is used as a symbol of spiritual protection, a symbol of Christianity, mystic and religious among the peoples of origin of this region of America; the Charge of Cavalry, which presents the historical event known as the Farroupilha Revolution, which occurred between 1835 and 1845, a regional revolt against Brazilian imperial power; the picture of the charqueadas, which shows the hand of the charqueadas of the south of the state, in which the slave population worked with the cut of the meat and the leather, thus contributing to the state economy; among others, making possible a learning about the culture of Rio Grande do Sul.

William Kapakos

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Barbara Jo White

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&

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A Focus on Legal-Technical Components of the Political Dimension of Globality

The resignation of the Equifax CIO and Chief Security Officer after the public announcement of the company's massive data breach exemplifies the need for Information Technology (IT) students to be aware of the importance of data security and the global ramifications of data breaches. Students graduating from Computer Information Systems programs must have an understanding of globalization as it affects IT. Steger (2009) describes globalization as the transformation toward globality, defined as "a social condition characterized by tight global economic, political, cultural, and environmental interconnections and flows that make most of the currently existing borders and boundaries irrelevant" (Steger, 2009, pg. 8). The political dimension is of particular interest to IT students as it relates to national and international laws and agreements regarding data privacy.

The Equifax data breach compromised the private data of over 143 million people, including potentially millions of people who are not United States (U.S.) citizens. The resulting public outcry has put U.S. data privacy laws on the public radar on a global scale. The U.S. has not yet developed comprehensive national laws that protect personal data and, as a result, is out of step with its global neighbors, such as the EU. In fact, for any U.S. company to share data across the borders of the EU, the first step is the EU-U.S. Privacy Shield self-certification, which demonstrates that the stricter EU data privacy standards are being met by the U.S. company. EU court rulings interpreting the Privacy Shield place an onus on IT executives to maintain an awareness of the continuing evolution of data privacy, laws, and obligations.

A survey was administered to undergraduate students in IT classes to study their awareness of the political dimension of globality. Survey items from Zollinger (2015) were used and similar items were developed around the theme of data privacy laws in the U.S. and the EU. It was hypothesized that students who consumed news would have higher globality scores as would students who travelled, briefly or extensively, or had a study

abroad experience. Independent sample t-tests showed that consuming news in any format (online, paper, or TV) had no effect on student globality scores. Additionally, while students with extensive international travel experiences had higher globality scores than students without such travel experiences, this occurred only for the items measured by Zollinger and not for the additional items related to data privacy and international standards. As expected, scores for the political dimension of globality including data privacy did not differ based on gender.

Christoph Karg

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Image-based Malware Detection Using Convolutional Neural Networks

Malware such as ransomware or computer viruses is one of major threats to computer systems. Besides the loss of reputation of the attacked companies and organizations, malware causes a fiscal damage of millions of dollars worldwide.

From a cyber criminal's point of view, the acquisition of new malware is quite easy. With so-called malware toolkits new malware variants can be constructed within a few minutes. These mutations may bypass anti-malware protection mechanisms with a high probability. Furthermore, criminals are selling malware as a service in the darknet. These offers even include a money-back warranty if the malware is not working for certain period of time.

A common counter measure against malware attacks is the usage of an anti-malware scanner. Many of these scanners use a signature based detection mechanism. The vendor extracts a pattern from the malware which is unique and can be used to identify the malware. The pattern extraction and the roll-out of the updated pattern database causes a delay of hours or even days until new patterns reach the hosts to be protected.

In this paper, an approach to detect malware with machine learning algorithms is presented. For convenience, the focus lies on malware which targets the Windows operating system. The basic idea of the approach is to interpret executables as images and train a convolutional neural network to detect malware. The training was done within the Google Tensorflow framework using an high end Nvidia graphics card built into a standard desktop PC. To evaluate the approach, the neural network had to classify malware which was created with Veil-Evasion, a tool to generate antivirus-evading malware payloads. As a main result, the trained convolutional neural networks were able to recognize and classify the malware with a high accuracy.

Ana Ktona

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The Appropriate System to Support Decision Making in Medicine

Clinical Decision Support Systems, which support physicians in making diagnostic and therapeutic decisions by providing to them passive and active referential information as well as reminders, alerts, and guidelines, attract much interest. Theoretical and practical researches have shown that well designed Clinical decision support systems help physician in disease diagnosis, treatment options, etc. There are two types of Clinical Decision Support Systems in medicine area: Knowledge-based CDSS and Non-knowledge-based CDSS. The logic of Knowledge-based CDSS is based on rules and associations of data in the form of IF ... THEN. These rules could be found by algorithms. The logic of Non-knowledge-based CDSS is based on models created by Machine Learning algorithms. Both types of CDSS have advantages and disadvantages. But, how do they compare when evaluated against each other? This paper will identify their logic performance through experimentation and analysis in order to compare them objectively. A representative algorithm will be chosen for each of these Clinical decision support systems, and then it will be run against three patient diagnosis datasets: diabetes diagnosis, contact lenses recommendation and breast cancer diagnosis. Data will be gathered on algorithm accuracy, for a varying dataset size. It is expected that knowledge based CDSS perform better in small dataset and non-knowledge based CDSS perform better in large datasets.

Carsten Lecon

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Motion Sickness in VR Learning Environments

Virtual 3D worlds are not only used for the visualization of complex learning matter, but get increasing importance in learning environments. Students for example act as avatars in an artificially generated world, in which they learn, develop, and present similarly. However, in our 3D lectures some of the learners suffered from motion sickness, an affect that is already known in computer games and similar uses.

For example, in our project 'Software Explorer' we use a virtual 3D world for visualizing complex software structures. When working in the 3D room, the students are asked to do some tasks like searching classes or look for the connections between packages. This is done by pointing to items with a 'laserpointer', or by moving through the virtual world. In concluding evaluations, some students felt some indisposition - like the real motion sickness in a car or on a ship; a few students even had to pause acting in the virtual room.

In our project 'Kinetosis' (motion sickness) we will examine the causes and the indications of a beginning motion sickness. In order to identify the triggers, we implement appropriate 3D worlds as test settings, for example buildings, computer games, or a virtual rollercoaster. In these settings, different parameters are tested, for example by adjusting frame rate, speed, acceleration, rotation, etc. We then measure resulting effects in the person's movement (via motion capture, video), eye movement (via eye tracking), body parameters (sweat, temperature, heart rate ...), etc.

We hope to confirm and extend our hypotheses of how to minimize the user's motion sickness like behavioural changes of the person (e.g. 'don't go backwards in a 3D room') or technical changes of the environment (e.g. adapting the frame rate, visual and acoustic diversion, and tools for controlled motion like teleport, etc.).

Qing Li

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Teacher Game Building: A Focus on Computational Thinking and Pedagogy

This study aims to improve our understanding of enactivism, a new theoretical perspective, thorough the examination of practicing teachers' game development and building experiences, focusing on computational thinking. Specifically, this study attempts to answer the following questions:

- 1) To what extent does computational thinking reflected in teacher created games?
- 2) What pedagogical considerations do teachers include when designing their educational games?

This study adopts a mixed methods research design. Participants are 70 teachers enrolled in a graduate course focusing on digital game based learning. Data collected include the teacher created games including their design documents and the digital version of the games. The analysis of the data revealed a few important findings. First, through game design and building, teachers were able to demonstrate an enhance understanding of computational thinking skills. Their games showed an average of proficiency level of the overall computational thinking skill. Second, when teachers create their games, the following 5 pedagogical considerations were most prevalent: 1). Curriculum goals as game objectives, 2). Visual appeal 3) gamer accomplishment, 4) scaffolding with supporting materials, and 5) gamer identity. When faced with an open-ended design template, pedagogy embedded in curriculum goals from existing curriculum mandates were in forefront for design considerations and was uniformly employed by all the teachers. Further, cross disciplinary approach was a highlight. Creating a sense of accomplishment was another highlight of teacher design consideration. Discussions of further results and implications are detailed in the paper.

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Peter Hall

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&

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The Ethics of Care: Online Counsellor Support in Higher Education Using Advanced Technology

An emerging challenge among Canadian universities that offer online programming is the lack of institutional services to support online students' mental health (Barr, 2014). Despite increasing online student enrolments and program expansions, online student support services have not kept up with the continuing growth of online education (Crawley & Fetzner, 2013; Jones & Meyer, 2012; Nolan, 2013). While some online students are self-identifying concerns and seeking help (Russo, Bruce, & Scull, 2017), in cases of inaccessible or nonexistent internal online mental health supports, they are relying on available services, such as requests for accommodations, to assist them in coping with their mental health challenges, yet which might not appropriately address the underlying mental health issues. For other students, their mental health issues are identified through student advisor or instructors' anecdotal observations regarding changes in mood or behavior (Barr, 2014; Lorenzetti, 2015). Regardless, the effects of mental health concerns are wide-reaching, but most predominately affect academic functioning and achievement (Cvetkovski, Reavley, & Jorm, 2012; Leahy et al., 2010; Stallman, 2010). Increasing online enrolments, the expansion of online courses and programs, and the growing recognition of the high rates of mental health problems experienced by young adults attending universities exacerbate the issue that many university counseling services have with resourcing constraints that limit the numbers of students that they can see face-to-face (Mowbray et al., 2006), let alone considering how to provide online mental health services. Furthermore, mental health challenges are anticipated in the very near future to be the most prevalent group of disabilities represented at Canadian universities, therefore adding urgency to understanding and addressing the needs of university students with mental health issues (Hanlon, 2012).

As a problem of practice, the lack of online supports and services for online university students emphasizes the gap between student mental health needs and the lack of mental health supports and services, which has a negative impact on academic functioning and achievement. Emerging technologies have opened up, expanded access to, and increased flexibility in counseling services and made it possible for human beings to connect with

other people, create and exchange information and digital resources, and support and learn from others in an open-networked environment.

This has made us consider technological solutions to research the lack of mental health services in H.E. In our first research scenario we report on research in the field of Artificial Intelligence working on the development of 'counselor bots'; clinical decision support tools and interactive virtual agent-based mental healthcare dissemination/delivery systems that are able to recognize and identify psychological distress from multimodal signals, based on database-driven algorithms. Such bots are expected in the near future to be able to act as counselors. Artificial intelligence offers new delivery tools and resources for learning and counseling. This raises questions about the design of training and professional development of counselors. Is it worthwhile to foster and instill human competencies that are driven by human interaction and clues for intervention in trainee counselors if, in the coming years, counselor bots will be available online to 'communicate' and 'interact' in counselor settings?

There are many Master's programs in Counseling and Psychology in North American universities. Most of these programs are face-to-face (F2F) and include a practicum element, as typically these programs prepare people to become F2F counselors. Our second research scenario will report on research in an atypical setting, in that, apart from the practicum, the training program is a fully online Master of Arts in Counseling Psychology program. This research involves new challenges in the form of emerging pedagogies and designs for online learning. One might wonder if such a program would be an adequate preparation for a profession in which the counselor's professional identity is related to talking with people, and getting to people's deepest inner thoughts through communication. The challenges and solutions to the conundrum of nurturing the counselor's voice through online learning is driving this component of our research.

These are only two of our research scenarios in which technology might be a solution to a problem of supporting counseling service development to support online students' mental health. It is pushing for a change in the traditional boundaries of F2F counselor interactions, and more generally the counseling profession and counselor education. We take our counselor supervision responsibility seriously and believe that we should shape our future profession, and our professional education, as emerging technologies seem to be pushing hard at the margins of the current counseling field. Suggestions have been made that talking and listening to a screen does improve mental health and the counselor bots can in the future take over responsibilities of human embodied counselors. Our research investigates what is at the heart of counseling, in particular the counselor voice, counselor identity, and interactions with clients, to investigate how emerging technologies might shape professional counselor education, pedagogy, and learning design in a positive way. Currently, well-trained counselors who

use their human clues and interaction competencies seem desirable over a robot, but by addressing challenges in technology-based learning we might be able to shape the counselor profession and counseling education of the future and solve the mental health support challenges in HE.

Ari Poutiainen

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Higher Music Education and Learning with Video Tutorials

The amount of music education included in the teacher education programs diminishes in Finland. Human and financial resources are cut down slowly but steadily. This means that student teachers receive less and less instruction in learning, playing, singing and teaching of school music instruments and voice.

Video tutorials have become a popular solution in this issue: While students were earlier taught the musical craft in intensive small group sessions, they are now given a license to a commercial internet service that is specialized in music education through video tutorials instead.

Video tutorials can hardly replace education that has its foundation in live human interaction. However, it is necessary to investigate if video tutorials could successfully be applied in some respects. In order to shed light on this, I have conducted a study on music education student teachers' reflections (N=95) on the matter at the Faculty of Educational Sciences of the University of Helsinki in 2015-2017. My research materials consist of a collection of essays, in which students contemplate and apply a selection of video tutorials from a Finnish tutorial service called Rockway.

Within my research materials students (1) assess the tutorials as a concept of and source for self-study, (2) reflect tutorials usability in the school music lessons, (3) evaluate them pedagogically, (4) develop original pedagogical applications from and for them and (5) place them in a wider pedagogical context and theoretical framework.

As expected, teacher students faced some challenges in learning music educational skills through video tutorials and preferred interactive live instruction. However, they also saw that the video tutorial concept has some interesting new potential.

I employ content analysis in my research. As a theoretical framework I apply blended learning by, for example, Friesen (2012).

Florian Pramme

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**FAST - FPGA-based Acceleration of Simulation Codes and
Real-Time Models**

Numerical codes are typically large modelling tools, software solvers or simulators. An example for a commercial modelling tool that includes many solvers is 'Multiphysics' from COMSOL GmbH. Paradigms for open-source solvers are 'OpenFoam' or 'Vampire', which compute the Navier-Stokes and the Landau-Lifshitz-Gilbert equations from physics, respectively. Samples for real-time simulators that even address a mass market are the widespread 'Grand Theft Auto V' video game for the Sony Playstation IV, or the open-source PC game 'VAMOS'.

The goal of the FAST project is to reduce the execution time of numerical codes that are typically executed on servers, PCs, video consoles or other handhelds and stands for 'FPGA-based acceleration of simulation codes and real-time models'. In principle, FAST can provide high-performance computing (HPC) for all types of computers, because it is connectable via USB to any host. It targets to be a low-cost and easy-to-use alternative to OpenCL or CUDA-based code accelerators, which are running on GPU-equipped graphics-cards, and which are expensive and tedious to program.

FAST implements a semi-automatic synthesis of multi-iterative loops inside of C/C++ codes for an FPGA. A multi-iterative loop is a hot spot in a numerical code, which is repeated many times, and in which a significant portion of the code's execution time is spent. For many codes, it is sufficient to accelerate their hot spots only, but not the big rest of the numerical code, in order to reduce the overall execution times.

In our project, we developed a criteria catalogue and a methodology to identify, which hot spots in a given C/C++ code are suited for being outsourced and synthesized. This is accomplished via static and dynamic source code analyses, together with a dependency analysis. After the identification of proper hot spots, the respective code fragments are semi-automatically transformed from C/C++ to synthesizable SystemC for an arbitrary target FPGA. This is possible, because hot spots are typically small code sequences. Additionally, simple Remote Procedure Calls (RPCs) are created by FAST as an interface between the transformed source code and its Outsourced hot spots, which makes FAST independent from the underlying FPGA and CPU types and operating system. A characteristics of the method is that the source code must be available, which makes it useful for open source projects and for code developers.

In essence, FAST is a new combination of configurable computing, automatic loop parallelization and semi-automatic FPGA synthesis via

SystemC. As a result, our methodology and tool chain allows us to execute numerical codes up to one order of magnitude faster than by a conventional processor core from Intel, AMD, IBM or ARM.

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Karen Swan

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Patrick Lowenthal

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&

Marcia Gentry

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Social Presence in Online Learning: Historical Perspectives with an Eye to the Future

For over twenty-five years, researchers and practitioners have explored different frameworks and theories, in order to improve upon and better understand students' learning experiences and needs in online environments. Social presence (SP), the ability to perceive others in an online environment, has emerged as a key factor; it has been shown that:

- The perception of SP can be (strongly) felt by participants in computer-mediated communication (Gunawardena, 1995; Richardson & Swan, 2003; Tu & McIsaac, 2002)
- SP influences students' participation and motivation to participate (Jorge, 2010; Mazzolini & Maddison, 2007)
- SP influences course and instructor satisfaction (Akyol & Garrison, 2008; Gunawardena & Zittle, 1997)
- SP impacts both actual and perceived learning (Hostetter & Busch, 2013; Joksimović, Gašević, Kovanović, Riecke, & Hatala, 2015; Kang & Im, 2013, Picciano, 2002).
- SP has implications for course design (Arbaugh, 2005; Mykota & Duncan, 2007; Swan, Matthews, Bogle, Boles, & Day, 2012; Tu, 2000)
- SP has implications for retention and intention to enroll in online course (Boston et al., 2009; Liu et al., 2009; Reio & Crim, 2013).

However, researchers continue to define social presence in different ways, use various instruments to measure it, and almost continuously investigate how every new technology influences it—often leaving practitioners and even other researchers at a loss for real-world implications. This presentation examines these issues by reviewing the history of social presence; looking at the different ways researchers think about and define it; and highlighting key findings from a recent meta-analysis that examined how social presence has been measured across contexts, disciplinary areas, and measures in relation to student outcomes. Moreover, the presentation provides strategies and activities that online instructors can use in their

online classes to improve their own social presence. Implications and future research will be discussed.

Alyssa San Jose

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How Pinteresting: Investigating the Internalizing Disorders Content on Social Media

Many efforts have been made to understand social media and the resources existing online (Feng, Cong, Chen & Yu, 2013; Granger & Reiter, 2015; Pham, 2014; Seaman & Tinti-Kane, 2013; Wang, Yang, Zheng & Sundar, 2016). However, prior studies have seldom been rigorous in researching specific platforms and particular areas of interest as well as thoroughly assessing the content being shared. This study examined Pinterest content sharing as a proxy for interest and possible implementation related to internalizing disorders amongst school personnel. Using the coding scheme from Hall and Breeden (under review), a sample of 49,627 pins from 499 randomly selected pinners following the National Association of School Psychology Pinterest account were coded by content area and subsequently assessed for level of evidence base. Significant associations were found in Chi-square analyses between the category of internalizing disorders, level of evidence base, and types of pins shared. Additionally, the category of internalizing disorder and the level of evidence base were found to have a significant interaction on how easy an intervention is to implement. Researching and assessing the content being shared amongst educational professionals on Pinterest may inform future studies concerning evidence-based implementation difficulties in schools.

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&

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An Approach for the Automated Detection of XSS Vulnerabilities in Web Templates

Websites are exposed to various threats such as injections or denial of service attacks. Hence, the protection of the web site and the underlying system components is of major importance in order to deploy a reliable and secure web application. The task of securing a web application is quite complex. It requires the hardening of the system components and installation of security patches on a regular basis. Furthermore, the web application should be checked against vulnerabilities by using penetration testing methods.

From a developer's point of view, security aspects should be considered in the early stage of web application's development life cycle already. Of special interest is the web template which is used to generate the user interface of the web page. This component connects the web application to the outside world. Hence, it is the main entrance point to inject malicious things into the web application.

In this paper, we present an approach to check web templates against cross site scripting (XSS) attacks in an automatic manner. The basic idea is inspired by the LLVM compiler which uses an internal representation to optimize the machine code independently from the used programming language. Instead of searching for vulnerabilities selectively in the template code itself, the web template is converted into an internal representation. This representation decouples the structure of the web template from the syntax of the template engine. The internal representation is analysed with respect to exploitable parts. The results of the analysis are potentially vulnerable code snippets. These snippets are coded back into the template format and are used within unit tests to check whether they can be exploited with actual attack vectors. The advantage of our approach is its universality. This is, it works with any kind of web template engine.

Susie Townsend

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Strategies for Online Learning Success

Effective online instruction depends on learning experiences appropriately designed and facilitated by knowledgeable educators. What kind of instructional designs, pedagogical practices, and administrative standards contribute to the development of effective online courses with high retention rates and positive student learning outcomes? The purpose of this presentation is to provide strategies so that they can make informed decisions in the implementation process. Based on experience I argue that effective online instruction is dependent upon 1) well-designed course content, motivated interaction between the instructor and learners, well-prepared and fully-supported instructors; 2) creation of a sense of online learning community; and 3) utilizing instructional learning strategies. In doing this, it is hoped that this will stimulate an on-going discussion of effective strategies that can enhance universities and faculty success in teaching online.

The success of an online course depends greatly on how actively engaged students are with the instructor, with their classmates, with the content, with technology, and with course management tools. Interactivity in any teaching and learning context involves students responding to information, seeking instructors' feedback, reflecting on the feedback, and acting to appropriately tailor personal learning experience. In many cases, effects of interaction in an online environment can be richer than in face-to-face situations, since students can critically evaluate their understanding of the content by sharing their knowledge and experiences in discussion questions and postings. Engaging activities for online courses are designed to be relevant to the content, associated with course objectives and outcomes, require active involvement from students, increase retention, and be fun and rewarding.

Christopher Weagle
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Social Media Usage between Faculty and Students and Its Implications on Policy Design

As social networking becomes an increasingly common feature in classrooms, it sometimes replaces or enhances information-exchanges once restricted to extra-curricular group work, office-hour meetings, email exchanges, and telephone conversations. As a result, implementing social networking in classroom environments offers the possibility to overcome barriers to communication presented by tradition means. This feature also has its place in fostering independent learning. For example, in constructivist paradigms, the common notion is that skills develop through peer collaboration in situated learning environments (Lave & Wenger, 1991). As a result, media applications, such as Whatsapp, can enhance learning and communication by creating an accessible shared space while also allowing teachers to maintain peripheral involvement, much as they would by being available to answer questions or offer advice. However, problems may arise when the role of teacher is either too central or too absent from this kind of group interaction. In addition, the increased access to the personal domain can challenge accepted norms. Therefore, the rules governing classroom-related social media usage must have clear criteria if these technologies are to be effective and unobtrusive. The research presented here discusses some of the benefits of using social media to encourage learner identity, as well as some of the possible challenges. It further examines these concepts through the criteria of existing university policies, and recommends solutions for possible limitations.