2015 IEEE Frontiers in Education Conference (FIE 2015)

El Paso, Texas, USA
21-24 October 2015

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**Integrating Service-Learning into Engineering and Computing Education**

- William C. Oakes (Purdue University, USA)
- Carla B. Zoltowski (Purdue University, USA)

**Teaching and Assessment Strategies that Value Innovative Thinking**

- Şenay Purzer (Purdue University, USA)
- Todd Fernandez (Purdue University, USA)

**Process to Draft the Program Educational Objectives for Undergraduate Engineering Degree Programs**

- Ramakrishnan Sundaram (Gannon University, USA)

**Agile Way of Educating**

- Gerald Gannod (Miami University - Oxford, USA)
- Douglas Troy (Miami University - Oxford, USA)
- Jerome Luczaj (Miami University - Middletown, USA)
- Diane Rover (Iowa State University, USA)

**Encouraging Information Rich Engineering Design**

- Michael Fosmire (Purdue University, USA)
- Amy Van Epps (Purdue University, USA)
- Laura Hanlan (Worcester Polytechnic Institute, USA)
2C: Pre-Conference Workshop: Agile Teaching and Learning
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Sohum Sohoni (The Ira A. Fulton Schools of Engineering, USA)
Suhas Xavier (The Ira A. Fulton Schools of Engineering, USA)

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11:00 AM - 12:30 PM  
Room: Kohlberg Room

**CONNECTING AND EXPANDING THE EMERGING ENGINEERING EDUCATION RESEARCH & INNOVATION (EER&I) COMMUNITIES**  
Karl Smith (Purdue University & University of Minnesota, USA)  
Ruth Streveler (Purdue University, USA)  
Rocio C. Chavela Guerra (American Society for Engineering Education, USA)

**T1B: Special Session: Movin' Along: Investigating Motion and Mechanisms Using Engineering Design Activities**  
Chair: Eric Durant (Milwaukee School of Engineering, United States)  
11:00 AM - 12:30 PM  
Room: Pancho Villa Room

**FIE 2015 SPECIAL SESSION - MOVIN' ALONG: INVESTIGATING MOTION AND MECHANISMS USING ENGINEERING DESIGN ACTIVITIES**  
Susan Donohue (University of Virginia, USA)  
Larry Richards (University of Virginia, USA)

**T1C: First and Second Year Topics I**  
Chair: Jon Sticklen (Michigan Technological University, United States)  
11:00 AM - 12:30 PM  
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**ALUMNI AS A RESOURCE TO INCREASE STUDENT RETENTION IN EARLY COMPUTER SCIENCE COURSES**  
Linda Ott (Michigan Technological University, USA)

**COMPARING COMMON AND DISCIPLINE-SPECIFIC FIRST-YEAR ENGINEERING PROGRAMS: EXAMINING THE NEED AND EXPLAINING THE STUDY**  
Mahnas Jean Mohammadi-Aragh (Mississippi State University, USA)  
Rachel L. Kajfez (The Ohio State University, USA)

**AN "OBJECTS FIRST, TESTS SECOND" APPROACH FOR SOFTWARE ENGINEERING EDUCATION**  
Veronika Thurner (Munich University of Applied Sciences, Germany)  
Axel Böttcher (Munich University of Applied Sciences, Germany)

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Bart Johnson (Itasca Community College, USA)  
Ron Ulseth (Iron Range Engineering, USA)  
Crystal Smith (Itasca Community College, USA)  
Derek Fox (Itasca Community College, USA)

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Christine Reilly (University of Texas-Pan American, USA)  
Emmett Tomai (University of Texas-Pan American, USA)  
Laura Grabowski (University of Texas-Pan American, USA)
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Chair: David Reeping (Ohio Northern University, United States)
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Shaoobo Huang (South Dakota School of Mines and Technology, USA)
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Xin Chen (Purdue University, USA)
Jennifer DeBoer (Purdue University, USA)

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Ari Korhonen (Aalto University, Finland)
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Mario Manso-Vázquez (University of Vigo, Spain)
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Rachel McCord (University of Tennessee, USA)

T2H: Learning Analytics II
Chair: Michael Mogessie Ashenafi (University of Trento, Italy)
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Room: Rio Grande Room

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**2:30 PM - 4:00 PM**
**Room:** Santa Fe Room

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**A PROJECT-BASED MULTI-DISCIPLINARY ELECTIVE ON DIGITAL DATA PROCESSING TECHNIQUES**
Firas Hassan (Ohio Northern University, USA)
Joao Lucas Magalini Zago (Ohio Northern University, USA)
Victor de Campos Pentea (Ohio Northern University, USA)
Rodrigo Santos (Ohio Northern University, USA)

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**DEVELOPING A COURSE MODULE FOR TEACHING CRYPTOGRAPHY PROGRAMMING ON ANDROID**
Jinsheng Xu (North Carolina A&T University, USA)
Xiaohong Yuan (North Carolina A&T State University, USA)

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**AN INSIDER THREAT ACTIVITY IN A SOFTWARE SECURITY COURSE**
Daniel Krutz (Rochester Institute Of Technology, USA)
Andrew Meneely (Rochester Institute of Technology, USA)
Samuel A Malachowsky (Rochester Institute of Technology, USA)

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**A STRUCTURED APPROACH TO TRAINING OPEN-ENDED PROBLEM SOLVING**
Sofia Cassel (Uppsala University, Sweden)
Björn Victor (Uppsala University, Sweden)

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**MOBILE SECURITY EDUCATION ON PORTABLE LABS**
Dan Chia-Tien Lo (Southern Polytechnic State University, USA)
Kai Qian (Southern Polytechnic State University, USA)
Wei Chen (Tennessee State University, USA)

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**T3A: Special Session: Introduction to Systematic Reviews in Engineering Education Research**
**Chair:** Liping Liu (Lawrence Technological University, United States)
**4:30 PM - 6:00 PM**
**Room:** Kohlberg Room

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**SPECIAL SESSION: INTRODUCTION TO SYSTEMATIC REVIEWS IN ENGINEERING EDUCATION RESEARCH**
Jeffrey E Froyd (Texas A&M University, USA)
Maura Borrego (University of Texas at Austin, USA)
Margaret Foster (Texas A&M University, USA)
Hyung Sok Choe (The University of Texas at Austin, USA)
Julie Martin (Clemson University, USA)
Xueshu Chen (University of Texas at Austin, USA)

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**T3B: Special Session: Exploring the Black Box of Dissemination: The Role of Professional and Organizational Development**
**Chair:** Walter C. Lee (Virginia Tech, USA)
**4:30 PM - 6:00 PM**
**Room:** Pancho Villa Room

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Stephanie Cutler (Embry-Riddle Aeronautical University, USA)
Alexandra Coso Strong (Franklin W. Olin College of Engineering, USA)
Mel Chua (Purdue University, USA)
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Chair: Marja Talikka(Lappeenranta University of Technology, Finland)
4:30 PM - 6:00 PM
Room: Brahma Room

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4:30 PM - 6:00 PM
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Friday, October 23

F1A: Special Session: Taking Stock: Using a Landscape Inventory to Drive Curriculum and Program Change
Chair: Yulei Pang (Southern Connecticut State University, USA)
9:00 AM - 10:30 AM
Room: Kohlberg Room

TAKING STOCK: USING A LANDSCAPE INVENTORY TO DRIVE CURRICULUM AND PROGRAM CHANGE
Elizabeth Nilsen (VentureWell, USA)
Victoria Matthew (VentureWell, USA)
Mary Besterfield-Sacre (University of Pittsburgh, USA)
Thema Monroe-White (SageFox Consulting Group, USA)

F1B: Special Session: Helping your students learn "Engineering-ese": Using the results of conceptual change research to inform your instruction
Chair: Ruth Streveler (Purdue University, USA)
9:00 AM - 10:30 AM
Room: Pancho Villa Room

HELPING YOUR STUDENTS LEARN "ENGINEERING-ERE": USING THE RESULTS OF CONCEPTUAL CHANGE RESEARCH TO INFORM YOUR INSTRUCTION
Ruth Streveler (Purdue University, USA)
Shane Brown (Oregon State University, USA)
Geoffrey Herman (University of Illinois at Urbana-Champaign, USA)
Holly Matusovich (Virginia Tech, USA)
Devlin Montfort (Oregon State University, USA)

F1C: Innovative Mobile Tools and Applications
Chair: Amalia Rusu (Fairfield University, United States)
9:00 AM - 10:30 AM
Room: Angus Room

SHOWNETELL: AN EASY-TO-USE TOOL FOR ANSWERING STUDENTS' QUESTIONS WITH VOICE-OVER RECORDING
Anand Bhojan (National University of Singapore, Singapore)
Kwan Yong Kang Nicholas (National University of Singapore, Singapore)
Nidhi Sharma (National University of Singapore, Singapore)

INNOVATIVE MOBILE TOOL FOR ENGINEERING EMBEDDED DESIGN AND SECURITY EDUCATIONS
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Yingnan Ma (Southern Polytechnic State University, USA)
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Chair: Jinghua Zhang (Winston-Salem State University, United States)
9:00 AM - 10:30 AM
Room: Brahma Room

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Chair: Robert M O'Connell (University of Missouri-Columbia, United States)
9:00 AM - 10:30 AM
Room: Charolais Room

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F1F: Industry Oriented Teaching and Learning
Chair: Bunmi Bababajide (Purdue University, United States)
9:00 AM - 10:30 AM
Room: Longhorn Room

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F1G: MOOCs and Big Data
Chair: Anna Douglas (Purdue University, United States)
9:00 AM - 10:30 AM
Room: Hereford Room

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F1H: Teaching and Learning Programming I
Chair: Roberto A Bittencourt (State University of Feira de Santana, Brazil)
9:00 AM - 10:30 AM
Room: Rio Grande Room

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F1: Cyber Security
Chair: Walter W Schilling, Jr (Milwaukee School of Engineering, USA)
9:00 AM - 10:30 AM
Room: Santa Fe Room

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F2A: Special Session: CE2016 Updated Computer Engineering Curriculum Guidelines
Chair: Xiaosong Li (Unitec Institute of Technology, New Zealand)
11:00 AM - 12:30 PM
Room: Kohlberg Room

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Victor Nelson (Auburn University, USA)
Joseph Hughes (Georgia Tech, USA)
Weidong Liu (Tsinghua University, P.R. China)
Junlin Lu (Peking University, P.R. China)
Andrew McGettrick (University of Strathclyde, United Kingdom)

F2B: Special Session: What the Heck is That?! Adaptation of Evidence-Based Instructional Practices
Chair: Lizabeth Schlemer (Cal Poly, San Luis Obispo, USA)
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Chair: James Huff (Harding University, USA)
5:00 PM - 6:30 PM
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Chair: Nathan Canney (Seattle University, USA)
5:00 PM - 6:30 PM
Room: Pancho Villa Room

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Katherine Goodman (University of Colorado, Boulder, USA)

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Chair: Brian Rague (Weber State University, United States)
5:00 PM - 6:30 PM
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Gustavo Alexandre (UFPE - Centro de Informática, Brazil)
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Rema Menon (Amrita University, India)
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Chair: Charles Wallace (Michigan Technological University, United States)
5:00 PM - 6:30 PM
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G. Lee (New Mexico State University, USA)
A. Michalenko (New Mexico State University, USA)
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F4E: K-12 Education III

Chair: Mary M Capraro (Texas A&M University, United States)

5:00 PM - 6:30 PM

Room: Charolais Room

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J. Dana-Farley (New Mexico State University, USA)
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5:00 PM - 6:30 PM
Room: Rio Grande Room

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9:00 AM - 10:30 AM
Room: Kohlberg Room

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Chair: Brian Skromme (Arizona State University, United States)
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Room: Angus Room

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Chair: Frank Vahid (University of California, Riverside, USA)
9:00 AM - 10:30 AM
Room: Charolais Room

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Erwin Delgado (The University of Texas at El Paso, USA)
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Jessica Halfacre (Clarkson University, USA)
John Moosbrugger (Clarkson University, USA)
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Elisabeth Wultsch (Clarkson University, USA)

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S1F: Online Assessment
Chair: Dazhi Yang (Boise State, United States)
9:00 AM - 10:30 AM
Room: Longhorn Room

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9:00 AM - 10:30 AM
Room: Hereford Room

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Room: Rio Grande Room

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<td>LEARNING ABOUT ENGINEERING EDUCATION RESEARCH: WHAT CONCEPTUAL DIFFICULTIES STILL EXIST FOR A NEW GENERATION OF SCHOLARS?</td>
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<td>Ruth A. Streveler (Purdue University, USA)</td>
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<td>Nicole P. Pitterson (Purdue University, USA)</td>
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<td>Avneet Hira (Purdue University, USA)</td>
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<td>Héctor Rodríguez-Simmonds (Purdue University, USA)</td>
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<td>Juan Ortega Alvarez (Purdue University, USA)</td>
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<td>APPRENTICESHIP OF OBSERVATION: IMPLICATIONS FOR THE ADOPTION OF EVIDENCE-BASED INSTRUCTIONAL PRACTICES</td>
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<td>Kari L. Jordan (Embry-Riddle Aeronautical University, USA)</td>
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<td>James J. Pembridge (Embry-Riddle Aeronautical University, USA)</td>
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<td>Heidi M. Steinhauer (Embry-Riddle Aeronautical University, USA)</td>
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<td>Timothy Wilson (Embry-Riddle Aeronautical University, USA)</td>
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<td>Douglas Holton (Embry-Riddle Aeronautical University, USA)</td>
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<td>AMBIGUITY DURING ENGINEERING PROBLEM SOLVING</td>
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<td>Elliot P. Douglas (University of Florida, USA)</td>
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<td>Sevcan Agdas (University of Florida, USA)</td>
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<td>Christine Lee (California State University East Bay, USA)</td>
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<td>Mirka Koro-Ljungberg (Arizona State University, USA)</td>
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<td>David J. Therriault (University of Florida, USA)</td>
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<td>BACKGROUND AND DEMOGRAPHIC FACTORS THAT INFLUENCE GRADUATION: A COMPARISON OF SIX DIFFERENT TYPES OF MAJORS</td>
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<td>Sara Hahler (Louisiana Tech University, USA)</td>
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<td>Marisa K. Orr (Louisiana Tech University, USA)</td>
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S2A: Technological Tools I
Chair: Jean Hertzberg (University of Colorado Boulder, USA)
11:00 AM - 12:30 PM
Room: Kohlberg Room

UNDERGRADUATE EXPERIMENTS WITH APERIODIC GRATINGS BASED ON
THE FIBONACCI SEQUENCE ................................................................. 1723
J.A. Monsoriu (Universitat Politècnica de València, Spain)
M.H. Giménez (Universitat Politècnica de València, Spain)
E. Ballester (Universitat Politècnica de València, Spain)
L.M. Sanchez-Ruiz (Universitat Politècnica de València, Spain)

AN INTERACTIVE LEARNING ENVIRONMENT FOR ASSISTING STUDENTS IN
SOLVING PROBLEMS ON DESIGNING OF LOGIC DIGITAL CIRCUITS BY
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Evandro de Barros Costa (University of Alagoas, Brazil)
Hemilis Joyse Barbosa Rocha (Federal Institute of Alagoas, Brazil)

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Krystian Radlak (Silesian University of Technology, Poland)
Mariusz Frackiewicz (Silesian University of Technology, Poland)
Marek Szczepanski (Silesian University of Technology, Poland)
Michal Kawulok (Silesian University of Technology, Poland)
Michal Czardybon (Future Processing, Poland)

ANALYSIS OF OPPORTUNITIES AND CHALLENGES OF THE ELECTRONIC
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Li-ping Cai (Central China Normal University, P.R. China)
Rui-hua Shi (Central China Normal University, P.R. China)
Wen-yan Niu (Central China Normal University, P.R. China)
Ming-Wen Tong (Central China Normal University, P.R. China)

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Katherine Goodman (University of Colorado, USA)
Jean Hertzberg (University of Colorado, USA)
Noah Finkelstein (University of Colorado, USA)

S2B: Computer Based Learning
Chair: Rogério Garcia (São Paulo State University, Brazil)
11:00 AM - 12:30 PM
Room: Pancho Villa Room

STEP-BASED TUTORING SYSTEM FOR INTRODUCTORY LINEAR CIRCUIT ANALYSIS .............. 1752
B. J. Skromme (Arizona State University, USA)
P. J. Rayes (Arizona State University, USA)
B. E. McNamara (Arizona State University, USA)
V. Seetharam (Arizona State University, USA)
X. Gao (Arizona State University, USA)
T. Thompson (Arizona State University, USA)
X. Wang (Arizona State University, USA)
B. Cheng (Arizona State University, USA)
Y.-F. Huang (University of Notre Dame, USA)
D.H. Robinson (Colorado State University, USA)
IMPLEMENTATION OF AN INTELLIGENT TUTORING SYSTEM USING MOODLE .......................................................... 1761
Vyshnavi Malathi Ramesh (International Institute of Information Technology, India)
N. J. Rao (International Institute of Information Technology, India)
Chandrashekar Ramanathan (International Institute of Information Technology, India)

A USER PROFILE DEFINITION IN CONTEXT OF RECOMMENDATION OF OPEN EDUCATIONAL RESOURCES. AN APPROACH BASED ON LINKED OPEN VOCABULARIES................................................... 1770
Janneth Chicaiza (Universidad Técnica Particular de Loja, Ecuador)
Nelson Piedra (Universidad Técnica Particular de Loja, Ecuador)
Jorge Lopez-Vargas (Universidad Técnica Particular de Loja, Ecuador)
Edmundo Tovar-Caro (Universidad Politécnica de Madrid, Spain)

SUPPORTIVE ENVIRONMENT FOR TEACHING AND LEARNING DIGITAL IMAGE PROCESSING.............................................................................................................. ................................... 1777
Lenon Fachiano Silva (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)
Celso Olivete Júnior (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)
Pedro Henrique Reis (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)
Rafael Silva Santos (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)
Ronaldo Celso Messias Correia (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)
Rogério Eduardo Garcia (Universidade Estadual Paulista "Júlio de Mesquita Filho", Brazil)

ADAPTATION RESOURCES IN VIRTUAL LEARNING ENVIRONMENTS UNDER CONSTRUCTIVIST APPROACH: A SYSTEMATIC REVIEW ................................................................................................................... 1784
Vitor Bremgartner (Federal University of Amazonas, Brazil)
José Magalhães, Netto (Federal University of Amazonas, Brazil)
Crediné Silva de Menezes (University of Rio Grande do Sul (UFRGS), Brazil)

S2C: Innovative Curriculum & Course Design III
Chair: Rebecca Reck (University of Illinois at Urbana-Champaign, United States)
11:00 AM - 12:30 PM
Room: Angus Room

BRIDGING THE DIVIDE:
STRATEGIES FOR COLLEGE TO CAREER READINESS IN COMPUTER SCIENCE................................................................. 1792
Wendy A Lawrence-Fowler (The University of Texas-Pan American, USA)
Laura M. Grabowski (University of Texas-Pan American, USA)
Christine F. Reilly (University of Texas-Pan American, USA)

THE INSTITUTIONAL ENVIRONMENT FOR STUDENT VETERANS IN ENGINEERING ............................................... 1800
Catherine E. Brawner (Research Triangle Educational Consultants, USA)
Catherine Mobley (Clemson University, USA)
Joyce Main (Purdue University, USA)
Susan M. Lord (University of San Diego, USA)
Michelle M. Camacho (University of San Diego, USA)

ASSESSING AN AFFORDABLE AND PORTABLE LABORATORY KIT IN AN UNDERGRADUATE CONTROL SYSTEMS COURSE .......................................................................................... ... 1805
Rebecca M. Reck (University of Illinois at Urbana-Champaign, USA)
Ramavarapu S. Sreenivas (University of Illinois at Urbana-Champaign, USA)
Michael C. Loui (Purdue University, USA)

HANDS ON PROJECT EXPERIENCE IN A CORE CLASS FOCUSED ON SUSTAINABILITY........................................ 1809
Anoop Desai (Georgia Southern University, USA)

October 21-24, 2015 El Paso, Texas
2015 IEEE Frontiers in Education Conference
S2D: Curriculum Design III
Chair: Rebecca Reck (University of Illinois at Urbana-Champaign, USA)
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Room: Brahma Room

BIOINFORMATICS CURRICULUM DEVELOPMENT AND SKILL SETS FOR BIOINFORMATICIANS ................................................................. 1813
Huanmei Wu (School of Informatics and Computing, USA)
Amritha Palani (School of Informatics and Computing, USA)

STUDENTS LEARN MORE WITH LESS TEXT THAT COVERS THE SAME CORE TOPICS ................................................................. 1820
Alex Edgcomb (University of California, Riverside, USA)
Frank Vahid (University of California, Riverside, USA)
Roman Lysecky (University of Arizona, USA)

VIRTUAL LABORATORY PLATFORM FOR COMPUTER SCIENCE CURRICULA ................................................................. 1825
Yuanyuan Li (Central South University, P.R. China)
Lei Xiao (Central South University, P.R. China)
Yu Sheng (Central South University, P.R. China)

CLOUD-BASED TEACHING IN AN ENGINEERING-PHYSICS COURSE ................................................................. 1832
John M. Long (Deakin University, Australia)

AN AUTOMATION OF THE COURSE DESIGN BASED ON MATHEMATICAL MODELING AND GENETIC ALGORITHMS ................................................................. 1840
Alexey Dukhanov (ITMO University, Russia)
Maria Karpova (ITMO University, Russia)
Vadim Shmelev (ITMO University, Russia)

S2E: Innovative Curriculum & Course Design IV
Chair: Brian Faulkner (University of Illinois, USA)
11:00 AM - 12:30 PM
Room: Charolais Room

STUDENTS OF ENGINEERING ON BEHALF OF PEOPLE WITH DISABILITIES: EVALUATING THE IMPACT OF AN INSTITUTION'S FLAGSHIP PROJECT ................................................................. 1844
Orna Muller (ORT Braude College of Engineering, Israel)
Noga Shalit (ORT Braude College of Engineering, Israel)
Orit Braun Benyamin (ORT Braude College of Engineering, Israel)

ENHANCING THE EDUCATIONAL EXPERIENCE FOR DEAF AND HARD OF HEARING STUDENTS IN SOFTWARE ENGINEERING ................................................................. 1849
Daniel E. Krutz (Rochester Institute of Technology, USA)
Samuel A Malachowsky (Rochester Institute of Technology, USA)
Scott D. Jones (Rochester Institute of Technology, USA)
Jayme A. Kaplan (St. Mary's School for the Deaf, USA)

GETTING THE ATTENTION OF UNDERREPRESENTED MINORITY COMMUNITY COLLEGE STUDENTS TO CONSIDER ENGINEERING AS A CAREER ................................................................. 1858
Mary R. Anderson-Rowland (Arizona State University, USA)
Armando A. Rodriguez (Arizona State University, USA)
Anita E. Grierson (Arizona State University, USA)

EFFECT OF ASSERTION HEADINGS AND EXPANDABLE EXAMPLES IN AN ONLINE ENGINEERING TEXTBOOK ................................................................. 1866
Brian Faulkner (University of Illinois at Urbana-Champaign, USA)
Geoffrey Herman (University of Illinois at Urbana-Champaign, USA)
STEM SUMMER CAMP FOLLOW UP STUDY: EFFECTS ON STUDENTS' SAT SCORES AND POSTSECONDARY MATRICULATION

Peter Boedeker (Texas A&M University, USA)
Ali Bicer (Texas A&M University, USA)
Robert M. Capraro (Texas A&M University, USA)
Mary Margaret Capraro (Texas A&M University, USA)
Jim Morgan (Texas A&M University, USA)
Luciana Barroso (Texas A&M University, USA)

NANOTECHNOLOGY STEM PROGRAM VIA RESEARCH EXPERIENCE FOR HIGH SCHOOL TEACHERS

Mangilal Agarwal (Indiana University-Purdue University Indianapolis, USA)
Quarat-ul-Ann Mirza (Indiana University-Purdue University Indianapolis, USA)
Joseph Bondi (Indiana University-Purdue University Indianapolis, USA)
Brandon Sorge (Indiana University-Purdue University Indianapolis, USA)
Maher Rizkalla (Indiana University-Purdue University Indianapolis, USA)
Richard Ward (Indiana University-Purdue University Indianapolis, USA)
Corbin Feldhaus (Charlestown High School, USA)
Amy Hinshaw (McKenzie Center for Innovation & Technology, Indianapolis, USA)
Kody Varahramyan (Indiana University-Purdue University Indianapolis, USA)

L.E.A.P.: LOCALIZED ENERGY AWARENESS PROGRAM THROUGH COLLABORATIVE K-UNIVERSITY STEM PROJECTS

Jamie Kennedy (Drexel University, USA)
Brandon Morton (Drexel University, USA)
Adam Fontecchio (Drexel University, USA)

USING COMMON ELEMENTS TO EXPLAIN ELECTROMAGNETISM TO CHILDREN: REMOTE LABORATORY OF ELECTROMAGNETIC CRANE

German Carro Fernandez (Spanish University for Distance Education - UNED, Spain)
Ramon Carrasco Borrego (Spanish University for Distance Education - UNED, Spain)
Elio Sancristobal Ruiz (Spanish University for Distance Education - UNED, Spain)
Manuel Castro Gil (Spanish University for Distance Education - UNED, Spain)
Francisco Mur Perez (Spanish University for Distance Education - UNED, Spain)

AN AGILE LEARNING DESIGN METHOD FOR OPEN EDUCATIONAL RESOURCES

Mauricio Massaru Arimoto (University of São Paulo, Brazil)
Ellen Francine Barbosa (University of São Paulo, Brazil)
Leonor Barroca (The Open University, United Kingdom)

STUDENT-PERCEIVED EFFECTIVENESS OF ONLINE CONTENT DELIVERY MODES
TOPIC BASED SEGMENTATION OF CLASSROOM VIDEOS ................................................................. 1910
Tayfun Tuna (University of Houston, USA)
Mahima Joshi (University of Houston, USA)
Varun Varghese (University of Houston, USA)
Rucha Deshpande (University of Houston, USA)
Jaspal Subhlok (University of Houston, USA)
Rakesh Verma (University of Houston, USA)

MOTIVATING STUDENTS WITH NEW MECHANISMS OF ON-LINE ASSIGNMENTS AND EXAMINATION TO MEET THE MOOC CHALLENGES FOR PROGRAMMING ................................................................. 1919
Xiaohong Su (Harbin Institute of Technology, P.R. China)
Tiantian Wang (Harbin Institute of Technology, P.R. China)
Jing Qiu (Harbin Institute of Technology, P.R. China)
Lingling Zhao (Harbin Institute of Technology, P.R. China)

SUPPORTING REAL OPEN EDUCATIONAL RESOURCES IN EDU AREA ......................................................... 1925
Manuel Caeiro-Rodriguez (Universidade de Vigo, Spain)
Martin Llamas-Nistal (Universidade de Vigo, Spain)
Manuel Fernández-Iglesias (Universidade de Vigo, Spain)
Fernando Mikic-Fonte (Universidade de Vigo, Spain)
Manuel Lama-Penin (Universidade de Santiago de Compostela, Spain)

S2II: Assessment
Chair: Senay Purzer (Purdue University, USA)
11:00 AM - 12:30 PM
Room: Rio Grande Room

ON THE EFFECTIVENESS OF USING MIDTERM EXAMINATIONS STRICTLY FOR FORMATIVE FEEDBACK ................................................................. 1933
Robert M. O'Connell (University of Missouri, USA)

AN ASSESSMENT ARCHITECTURE FOR COMPETENCY-BASED LEARNING: VERSION 1.0 ..................... 1936
Jeffrey J. Evans (Purdue University, USA)
Esteban Garcia (Purdue University, USA)
Michael Smith (Purdue University, USA)
Amy Van Epps (Purdue University, USA)
Michael Fosmire (Purdue University, USA)
Sorin Matei (Purdue University, USA)

SYSTEMS THINKING SKILLS OF UNDERGRADUATE ENGINEERING STUDENTS ........................................... 1943
Shaobo Huang (South Dakota School of Mines and Technology, USA)
Karim Heinz Muci-Kuchler (South Dakota School of Mines and Technology, USA)
Mark D. Bedillion (South Dakota School of Mines and Technology, USA)
Marius D. Ellingsen (South Dakota School of Mines and Technology, USA)
Cassandra M. Degen (South Dakota School of Mines and Technology, USA)

AN ANALYSIS OF THE PROVISION OF CONTEXT WITHIN EXISTING REMOTE LABORATORIES ................................................................. 1948
Tania Machet (The University of Sydney, Australia)
David Lowe (The University of Sydney, Australia)
EVALUATION AND CONTINUOUS IMPROVEMENT IN A MULTIDISCIPLINARY S-STEM PROGRAM FOCUSING ON PROFESSIONAL SKILLS, GOALS & MENTORING ................................................................. 1957
Robert H. Kinzel (Minnesota State University, Mankato, USA)
Jennifer Veltsos (Minnesota State University, Mankato, USA)
Rebecca A. Bates (Minnesota State University, Mankato, USA)
Rachel E. Cohen (Minnesota State University, Mankato, USA)
Winston Sealy (Minnesota State University, Mankato, USA)
Deborah K. Nykanen (Minnesota State University, Mankato, USA)

S2I: Innovative Curriculum & Course Design V
Chair: Dan Tappan (Eastern Washington University, USA)
11:00 AM - 12:30 PM
Room: Santa Fe Room

A COMPARATIVE ANALYSIS OF TWO GLOBALLY DISTRIBUTED GROUP PROJECTS:
A PERSPECTIVE FROM CSCW/CSCL RESEARCH.......................................................................................... 1964
Roger McDermott (Robert Gordon University, United Kingdom)
Mats Daniels (Uppsala University, Sweden)
Åsa Cajander (Uppsala University, Sweden)
Julian Bass (Robert Gordon University, United Kingdom)
JayPrakash Lalchandani (International Institute for Information Technology, India)

A QUASI-NETWORK-BASED FLY-BY-WIRE SIMULATION ARCHITECTURE FOR TEACHING SOFTWARE ENGINEERING .............................................................. 1973
Dan Tappan (Eastern Washington University, USA)

PEER INSTRUCTION METHODOLOGY FOR LINEAR ALGEBRA SUBJECT:
A CASE STUDY IN AN ENGINEERING COURSE............................................................................................ 1981
Katiuscia C. B. Teixeira (Federal University of Ceará, Brazil)
Thomaz E. V. Silva (Federal University of Ceará, Brazil)
Joao C. M. Mota (Federal University of Ceará, Brazil)
Natália C. Barroso (Federal University of Ceará, Brazil)
Eduardo V. O. Teixeira (Federal University of Ceará, Brazil)

AN INTEGRATED CURRICULUM FOR INTERNET OF THINGS:
EXPERIENCE AND EVALUATION ................................................................................................................. 1988
Simon G. M. Koo (Jesuit Liberal Arts College, Hong Kong)

USING AN INTERACTIVE ANIMATED TOOL TO IMPROVE THE EFFECTIVENESS OF LEARNING CPU SCHEDULING ALGORITHMS ................................................................. 1992
Sukanya Suranauwarat (National Institute of Development Administration (NIDA), Thailand)

S3A: Innovative Curriculum & Course Design VI
Chair: Paul B. Crilly (United States Coast Guard Academy, USA)
2:30 PM - 4:00 PM
Room: Kohlberg Room

ANOTHER PERSPECTIVE FOR LINEAR EQUATIONS, MATRICES AND THE TECHNOLOGICAL TOOLS IN LEARNING .......................................................................................... 1999
Rogelio Palomera-Garcia (U. of Puerto Rico at Mayaguez, Puerto Rico)

HOW MANY POINTS SHOULD BE AWARDED FOR INTERACTIVE TEXTBOOK READING ASSIGNMENTS? ............................................................................................................. 2004
Alex Edgcomb (University of California, Riverside, USA, USA)
Frank Vahid (University of California, Riverside, USA, USA)
COMBINING MATLAB® SIMULATION WITH TELECOMMUNICATIONS INSTRUCTIONAL MODELING (TIMSTM) IN A SENIOR LEVEL COMMUNICATIONS COURSE
Richard J. Hartnett (U.S. Coast Guard Academy, USA)
Paul B. Crilly (U.S. Coast Guard Academy, USA)

MORE THAN JUST RIGHT OR WRONG: USING CONCEPT QUESTIONS TO DISCERN STUDENTS' THINKING IN MECHANICS
Jeffrey L. Newcomer (Western Washington University, USA)

S3B: Global Programs
Chair: Joyce B. Main (Purdue University, United States)
2:30 PM - 4:00 PM
Room: Pancho Villa Room

ENTERPRISE ARCHITECTURE OF COLOMBIAN HIGHER EDUCATION
Ricardo Llamosa-Villalba (Industrial University of Santander, Colombia)
Dario J. Delgado Q. (Industrial University of Santander, Colombia)
Luz Torres Carreño (Industrial University of Santander, Colombia)
Andres Bueno Barajas (Industrial University of Santander, Colombia)
Ana M. Paéz Q. (Industrial University of Santander, Colombia)
Edgar Garcia Sneyder (Industrial University of Santander, Colombia)

EVIDENCE-BASED APPROACHES FOR ENGINEERING GLOBAL PREPAREDNESS PROGRAMMING: RESEARCH TO INFORM PRACTICE
Scott C. Streiner (University of Pittsburgh, USA)
Mary Besterfield-Sacre (University of Pittsburgh, USA)

EXAMINING HOW INTERNATIONAL EXPERIENCES PROMOTE GLOBAL COMPETENCY AMONG ENGINEERING GRADUATE STUDENTS
Lauren B. Denney (Purdue University, USA)
Matilde Sánchez-Peña (Purdue University, USA)
Joyce B. Main (Purdue University, USA)

A SEMESTER-LONG STUDY ABROAD MODEL FOR ENGINEERING STUDENTS - THE UNIFIED PROJECT APPROACH
John W. Dyer (The University of Oklahoma, USA)
Theresa M. Marks (The University of Oklahoma, USA)
Chris Ramseyer (The University of Oklahoma, USA)
James J. Sluss (The University of Oklahoma, USA)
P. Simin Pulat (The University of Oklahoma, USA)
Kirk Duclaux (The University of Oklahoma, USA)

S3C: Outreach & University, Community Collaborations
Chair: Natascha Trellinger (Purdue University, United States)
2:30 PM - 4:00 PM
Room: Angus Room

LEARNING PHILOSOPHIES: A GLIMPSE INTO STUDENTS' APPROACHES TO A LEARNING
Natascha M. Trellinger (Purdue University, USA)
Michael C. Loui (Purdue University, USA)
A BRIDGE TO ENGINEERING: A PERSONALIZED PRECALCULUS (BRIDGE) PROGRAM ............................... 2053
Sandra B. Nite (Texas A&M University, USA)
G. Donald Allen (Texas A&M University, USA)
Michael Pilant (Texas A&M University, USA)
Robert M. Capraro (Texas A&M University, USA)
Mary M. Capraro (Texas A&M University, USA)
Jim Morgan (Charles Sturt University, USA)

FIRST IN THE FAMILY: A COMPARISON OF FIRST-GENERATION AND NON-FIRST-GENERATION ENGINEERING COLLEGE STUDENTS ................................................................. 2059
Dina Verdin (Purdue University, USA)
Allison Godwin (Purdue University, USA)

EFFECTS OF PRE-COLLEGE ENGINEERING PARTICIPATION ON FIRST-YEAR ENGINEERING OUTCOMES ............................................................................................................................... 2067
Noah Salzman (Boise State University, USA)
Matthew Ohland (Purdue University, USA)

S3D: First and Second Year Topics III
Chair: James Morris (Portland State University, USA)
2:30 PM - 4:00 PM
Room: Brahma Room

EARLY IDENTIFICATION OF AT-RISK STUDENTS IN A LOWER-LEVEL ENGINEERING GATEKEEPER COURSE .......................................................................................................................... 2071
Horacio Vasquez (The University of Texas-Pan American, USA)
Arturo A. Fuentes (University of Texas-Pan American, USA)
Javier A. Kypuros (The University of Texas-Pan American, USA)
Mohammad Azarbayejani (The University of Texas-Pan American, USA)

ENGINEERING CURRICULUM READINESS: IMPLEMENTING AN ANALYTICAL AND COMMUNICATION SKILLS BUILDING COURSE FOR THE TECHNICAL DISCIPLINES ............................. 2080
Barbara Christe (IUPUI, USA)
Alison Stevenson (IUPUI, USA)

GETTING PAST THE FIRST YEAR: RETAINING ENGINEERING MAJORS ................................................................................................................................. 2084
A.E. Dreyfuss (NYC College of Technology, CUNY, USA)
Melanie Villatoro (NYC College of Technology, CUNY, USA)
Michael C. Loui (Purdue University, USA)
James E. Becvar (University of Texas El Paso, USA)
Geoffrey B. Saupe (University of Texas El Paso, USA)
Wayne Johnson (Mass Insight Global Partnerships, USA)

S3E: Student Interest
Chair: Linda P. DuHadway (Utah State University, USA)
2:30 PM - 4:00 PM
Room: Charolais Room

ARE THEY SIMPLY INTERESTED? AN EXPLORATION OF ENGINEERING STUDENTS’ MOST FAVORITE CLASS .......................................................................................................................... 2090
Dazhi Yang (Boise State University, USA)
Louis S. Nadelson (Utah State University, USA)
Kimberly Hardy (Boise State University, USA)
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<td>IS THIS &quot;TRANSFER SHOCK&quot;? EXAMINING THE PERCEPTIONS OF ENGINEERING</td>
<td>Susan O'Shaughnessy (Dublin Institute of Technology, Ireland)</td>
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<td>STUDENTS WHO ARTICULATE WITHIN THE IRISH HIGHER EDUCATION CONTEXT</td>
<td>Anne Marie McCarrick (Dublin Institute of Technology, Ireland)</td>
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<td>Fionnuala Farrell (Dublin Institute of Technology, Ireland)</td>
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<td>Una Beagon (Dublin Institute of Technology, Ireland)</td>
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<td>Lance C. Pérez (University of Nebraska-Lincoln, USA)</td>
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<td>WHATSAPP WITH LEARNING PREFERENCES?</td>
<td>Imelda Smit (North-West University, South Africa)</td>
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<td>THE PUERTO RICO CUBESAT PROJECT TO ATTRACT STEM STUDENTS INTO THE</td>
<td>Rachid Darbali-Zamora (University of Puerto Rico Mayagüez Campus, Puerto</td>
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<td>AREA OF AEROSPACE ENGINEERING</td>
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<td>Eduardo I. Ortiz-Rivera (University of Puerto Rico Mayagüez Campus, Puerto</td>
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<td>Amilcar A. Rincon-Charris (Inter American University of Puerto Rico,</td>
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<td>Bayamón, Puerto Rico)</td>
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<td>INFORMING CHANGE: COURSE CONTENT ANALYSIS AND ORGANIZATION</td>
<td>Linda P. DuHadway (Utah State University, USA)</td>
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<td>Thomas C. Henderson (University of Utah, USA)</td>
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**S3F: Student-Centered Education IV**

**Chair:** Jose Aguilar (Universidad de Los Andes, Venezuela)

**Room:** Longhorn Room

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