



New York Cyber Security and Engineering Technology Association
(NYSETA)

R·I·T



Rochester Institute of Technology
October 22-23, 2015

NYSETA Conference Program

NYSETA Conference Program

Conference Officials	3
Worker Credits.....	4
Program Schedule	5
Tour Information.....	6
Exhibitor and Host Recognition	7
Track 1 - Innovative Design and Development Practices	7
Track 2 - Technology Innovations Impacting ET Education	10
Track 3 - Access Technologies and Innovations	11
Track 4 - STEM Education.....	12
Keynote Abstracts.....	13
Track 1 Abstracts	133
Track 2 Abstracts	165
Track 3 Abstracts	187
Track 4 Abstracts	209
Poster Abstracts	221
Exhibitor Abstracts	224
After Dinner Abstract.....	256
Biographies	287
Notes	40
Campus Map.....	454

Conference Officials

Conference Co-Chair:



James Mallory, Professor
Information and Computing Studies Department
National Technical Institute for the Deaf
Rochester Institute of Technology

Conference Co-Chair:



John Stratton, Professor Emeritus
College of Applied Science and Technology
Rochester Institute of Technology

Conference Co-Chair:



S. Manian Ramkumar, Professor
Manufacturing and Mechanical Engineering Technology
College of Applied Science and Technology
Rochester Institute of Technology

Special Thanks to the Following Individuals for their Assistance with Planning and Implementing the Conference:

Planning Committee:

Sue Roethel
Rachel Morse
Julie Knopf
Jim Mallory
John Stratton
S. Manian Ramkumar

FMS Support

Petrina Brown
Mark Morrison
Kathleen Rydelek

Room Managers

Dave Lawrence
Scott Wolf
John Sweeney
Nancy Raco
Mark Jeremy
Mark Oliver
Dave Krispinsky, PDH manager

Website Support

Matt Dana
Jeff Mathisen
Andrew Barrington
Pam Carmichael

Tech Support & Captioning

Paula Zack
Margaret Otis
Peter Reeb
Bob Brewer
Paula Hellaby

Conference Program

J.D. Incavo

Program Schedule

Thursday, October 22, 2015

- 7:30 a.m. to 8:30 a.m. Exhibitor Setup at Ellie's Place (Near SDC-1310)
- 8 a.m. to 9:20 a.m. Registration, breakfast, networking and visit exhibitors (SDC-1310/Ellie's Place)
- 9:40 a.m. to 11:30 a.m. (SDC-1300/1310)
 - Welcome and opening talk: Dr. Gerald Buckley, NTID Dean, RIT VP
 - "Cyber Security and You": Dr. Jane LeClair
 - "Engineering and Its Role in Next Generation Science Standards": Dr. Randy Yerrick
- 11:40 a.m. to 12:55 p.m. Oral Presentations (parallel sessions)
 - Track 1(RSC-2140): Innovative Design and Development Practices
 - Track 2(RSC-2170): Technology Innovations Impacting ET Education
 - Track 3(RSC-1180): Access Technologies and Innovations
 - Track 4(RSC-2120): STEM Education
- 1 p.m. to 2:15 p.m.
 - Lunch (SDC-1310/Ellie's Place)
 - Exhibitor Formal Presentations (SDC-1310/Ellie's Place)
 - Poster Setup (Rosica Hall Level 2)
- 2:20 p.m. to 4:55 p.m. Oral Presentations (parallel sessions)
 - Track 1(RSC-2140): Innovative Design and Development Practices
 - Track 2(RSC-2170): Technology Innovations Impacting ET Education
 - Track 3(RSC-1180): Access Technologies and Innovations
 - Track 4(RSC-2120): STEM Education
- 5 p.m. to 5:45 p.m. Interest Groups Business Meetings
 - Electrical: RSC-2190
 - Mechanical: RSC-2110
 - Civil: RSC-2170
 - Cyber Security: RSC-2120
- 6 p.m. to 7 p.m. Networking (Radisson)
- 7 p.m. to 8 p.m. Dinner (Radisson)

- 8 p.m. to 9 p.m. Speaker (Radisson)
 - “The IMAX Laser Projection System: From 0 to Insane in Under 2 Years”: Barry Silverstein

Friday, October 23, 2015

- 8 a.m. Working Breakfast at Radisson
- 8:15 a.m. to 8:45 a.m. Council Meeting - all invited
- 8:45 a.m. to 9:50 a.m. NYSETA Business Meeting - all invited
- 9:50 a.m. Sign out of Radisson
- Tours

Tour # 1: Harris Corporation / Communication Systems, Jefferson Rd., Rochester, NY

Arrive Harris Corporation at about 10:30 AM. Drive yourselves. If there are those who need a ride, we will try to arrange carpools. Dr. Ramkumar will be the RIT guide for the tour.

Special Note: You will need to sign up for this as you register on Thursday morning. Per their request: “We will also need a list of names, employment, function, and US citizen (Y/N) who will be attending. We will have to submit this information and get approval from our compliance team.”

Tour # 2: Cutting Edge Development Laboratories at NTID Rosica Hall, NTID, Rochester, NY

Arrive at the SDC where you registered around 10:00. Professor Gary Behm will lead the tour and show you the latest developments and patents that are pending. Tour sign up will be also be Thursday morning but last minute attendees are also welcomed.

Thank You to Hosts and Exhibitors!

In addition to our wonderful RIT host colleges, NTID and CAST, we would like to thank our 2015 Conference Exhibitors whose generosity makes this conference possible! Please take time during the conference to visit with these exhibitors.



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RIT's School of Individualized Studies: Because every tiger's stripes are different, is the motto for this part of RIT that provides individual programs of studies for each student. Yes, some of them are technical combined with business or other RIT specialized programs. Contact: Abby Cantwell 585-475-7297 email ambcada@rit.edu.



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Track 1 - Innovative Design and Development Practices*

Held in RSC -2140 Unless Otherwise Indicated

- 8:00 – 9:20** Breakfast (SDC-1300/1310)*
- 11:40 – 12:15** Bridging Networks, Systems, and, Controls Frameworks for Cybersecurity Curricula & Standards Development
Dr. Yogesh Malhotra, SUNY Corning, ymalhotr@corning-cc.edu
- 12:20 – 12:55** Fully Parallel Implementation of the MK Transformation Encryption Algorithm on FPGA
Gordon Werner, Rochester Institute of Technology, gxw9834@rit.edu
- 1:00 – 2:15** Lunch, Exhibitors - Ellie's Place (SDC-1310)
- 2:20 – 2:55** Automated People Mover Design and Implementation
Dr. Raymond Ptucha and Nathan Biviano, Rochester Institute of Technology, rwpeec@rit.edu
- 3:00 – 3:35** Fault Tree Reliability Analysis of Network Configurations in Cybersecurity Intrusion Detection Systems
Dr. Stephen Egarievwe, et al., Alabama A&M University, stephen.egarievwe@aamu.edu
- 3:40 – 4:15** Network Security via Cryptographic Validity
Aparicio Carranza, et al., CUNY - NYCC of Technology, acarranza@citytech.cuny.edu
- 4:20 – 4:55** Measure Twice, Design Once:
William Dean, Alfred State College, DeanWC@alfredstate.edu
CANCELLED – GO TO POSTER SESSION INSTEAD
- 5:00 – 5:45** Interest Group Meetings

*All sessions on Track 1 are PDH-approved

** SDC room numbers are located in the CSD building on the RIT campus map
Attendance to two PDH-approved sessions are required to receive one PDH credit

Track 2 - Technology Innovations Impacting ET Education

Held in RSC -2170 Unless Otherwise Indicated

8:00 – 9:20 Breakfast (SDC-1300/1310) **

11:40 – 12:15 Closing the Gap: The Need for Women and Minorities in Cybersecurity
Dr. Jane LeClair, CEO of National Cybersecurity Institute at Excelsior College,
JLeClair@excelsior.edu

12:20 – 12:55 Material Chemical Mitigation Through Zoning and Landscaping Towards Understanding Sustainability Within the Site*
Prof. Edward Davis, Queensborough Community College, edavis@qcc.cuny.edu

1:00 – 2:15 Lunch, Exhibitors - Ellie's Place (SDC-1310) **

2:20 – 2:55 Design Principles for Defense-in-Depth*
Dr. Josephine Wolff, Rochester Institute of Technology, jcwgpt@rit.edu

3:00 – 3:35 Dimensioning Strategy for Introductory Computing Graphics Students
Prof. John Longwell, Corning Community College, longwell@corning-cc.edu

3:40 – 4:15 Adaptable Technologists for High-tech Ecosystem
Dr. Sam Samanta, Finger Lakes Community College, Sam.Samanta@flcc.edu

4:20 – 4:55 The Evolution of Student Work Product in Construction Management Courses in the Construction Management Curriculum at SUNY College of Environmental Science and Forestry
Kenneth Tiss, SUNY College of Environmental Science and Forestry,
kjtiss@esf.edu

5:00 – 5:45 Interest Group Meetings

*PDH-approved sessions

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Attendance to two PDH-approved sessions are required to receive one PDH credit

Track 3 - Access Technologies and Innovations*

Held in RSC -1180 Unless Otherwise Indicated

8:00 – 9:20 Breakfast (SDC-1300/1310)**

11:40 – 12:55 Automatic Speech Recognition Systems as Tools to Enhance Spoken Communication in the Classroom

Dr. Linda G. Gottermeier, Dr. Carol L. De Filippo, Dr. Raja Kushalnagar and Bonnie L. Bastian, Rochester Institute of Technology, lggnca@ntid.rit.edu
Thibault Michael Duchemin and Pieter Doevendans (Transcense Labs)

1:00 – 2:15 Lunch, Exhibitors - Ellie's Place (SDC-1310)**

2:20 – 2:55 Innovative Solutions using 3D Kinect

Prof. Brian Trager, et al., Rochester Institute of Technology,

3:00 – 3:35 Using C-Print Mobile in Postsecondary STEM Labs

Prof. Michael Stinson, et al., Rochester Institute of Technology,
msserd@ntid.rit.edu

3:40 – 4:15 Accessible Smart Home System for Deaf and Hard-of-Hearing

Prof. Joe Stanislow, et al., Rochester Institute of Technology, jssnbs@ntid.rit.edu

4:20 – 4:55 Optimal Viewing Distances for Deaf Students

Prof. Karen Beiter, Rochester Institute of Technology, kjbndp@ntid.rit.edu

5:00 – 5:45 Interest Group Meetings

NTID is at the forefront of Access Service Technology. The technology and operations behind this realtime captioning is summarized as follows by Robert Brewer, chief NTID captioning Engineer: "Real Time Captioning has a simple requirement for the captionist... **they need to hear what is being said in order to caption it.** Since NTID's older buildings and main presentation venues have abundant connectivity of audio (copper and Cat 5) as well as phone connections in strategic places this is typically not an issue. For the NYSETA presentations in Rosica Hall this is not the case, Engineering Services has no "tie lines" to this building and there are limited phone resources available. To overcome these restrictions we will use/demonstrate a "wireless" model to not only export the audio but also to receive the captions from a secure URL. This will all be done from a single Mac laptop. By using a USB microphone to **listen** to the presenter, the audio will be incorporated into a BlueJeans meeting (IP) that will allow for our remote captionist to dial into the meeting and listen through a phone bridge. The output from their captioning computer will then be delivered to us via secure URL on a page (that can be customized to the users preferences of size, layout, and colors) to be displayed from the same laptop onto a large display in the front of the room. We will also make this URL available for any of our audience members who might have their own devices. The weakest link of this entire system will be the network connection."

*ALL sessions on Track 3 are PDH-approved

** SDC room numbers are located in the CSD building on the RIT campus map

Attendance to two PDH-approved sessions are required to receive one PDH credit

Track 4 - STEM Education*

Held in RSC -2120 Unless Otherwise Indicated

8:00 – 9:20 Breakfast (SDC-1300/1310)**

11:40 – 12:15 Breakout Session

Dr. Randy Yerrick, University at Buffalo, ryerrick@buffalo.edu

12:20 – 12:55 Encouraging Deaf and Hard-of-Hearing Student Involvement in Undergraduate Research in the STEM Fields

Dr. Todd Pagano, Rochester Institute of Technology, tepnts@ntid.rit.edu

1:00 – 2:15 Lunch, Exhibitors - Ellie's Place (SDC-1310)**

2:30 – 2:50 Doing Physics Experiments with Students in the Virtual World of Second Life
Vicki Robinson, Rochester Institute of Technology, vicki.robinson@rit.edu

3:00 – 3:35 STEM Education in the 21st Century: Creating a Virtual Community of Practice for STEM Learners

Lisa Elliot and Donna Easton, Rochester Institute of Technology,
lbenrd@ntid.rit.edu

3:40 – 4:15 Using MATLAB for stability analysis in Controls Engineering

Dr. Cyrus Hagigat, University of Toledo, cyrus.hagigat@utoledo.edu

4:20 – 4:55 Semi-Flipped Learning Modules with Educational Design Patterns in Interdisciplinary Brain-Inspired Computing Course

Dr. Dhiresha Kudithipudi, et al., Rochester Institute of Technology,
dxkeec@rit.edu

5:00 – 5:45 Interest Group Meetings

*NONE of the sessions on Track 4 are PDH-approved

** SDC room numbers are located in the CSD building on the RIT campus map

Attendance to two PDH-approved sessions are required to receive one PDH credit

Keynote Abstracts

Dr. Jane LeClair

The digital systems of our nation are under escalating cyber attack from those with malicious intent. Our private businesses, educational institutions, government agencies and critical infrastructures are increasingly vulnerable not only to hackers who have long sought financial gain, but increasingly by state sponsored 'bad actors' seeking inroads into our nation's most sensitive areas. The task of keeping intruders away from our data has fallen to IT personnel and cyber warriors. There is a growing need for cybersecurity personnel but the massive deficit in the number of well educated and trained individuals available to meet those needs continues to grow. Learn more about where we are today, where we need to be tomorrow and what you can do to help strengthen our nation's defenses.

Dr. Randy Yerrick

The Next Generation Science Standards have called for engineering practices to be incorporated in the latest national science education reform in the USA. Historically there has been no explicit invitation for engineers to enter the arena of K-20 reform. Now that engineers who may be researchers by training and teachers by appointment are being called into conversations regarding teaching expertise, best practices, appropriate evaluation, curricular design, and many more educational topics. What is the requisite knowledge of a true "Engineering Educator?" How can engineers wisely join into education public discourse and make real contributions? Dr. Yerrick will outline several issues inherent in NGSS reform as well as outline common land mines engineers can avoid when stepping into efforts to reform classrooms, assessments, activities, and the ever increasingly diverse student body

Track 1 Abstracts

Innovative Design and Development Practices

Bridging Networks, Systems, and, Controls Frameworks for Cybersecurity Curricula & Standards Development – Malhotra, Yogesh

Applied Cybersecurity practices in the US private and public industry are transitioning to an overall focus on Cyber Risk Management. It is hence necessary to align IT-Cybersecurity professional association application standards and related educational curricula with emerging applications in practice. Current standards and educational curricula seem fragmented across Networks Protocols and Network Analysis Tools Frameworks, Systems and Networks Infrastructure Frameworks, and, Risk Management & Controls Policy Frameworks. This article develops an applied framework for aligning, integrating, and, streamlining standards and curricula across the above three levels to align them with needs of applied Risk Management practice. This article also demonstrates the contribution of the proposed Cyber Risk Management framework in addressing critical gaps in global Banking and Finance Cybersecurity and Information Assurance practices as an example while being extendable to multiple other industries such as Healthcare.

Fully Parallel Implementation of the MK Transformation Encryption Algorithm on FPGA – Werner, Gordon

Authenticated encryption (AE) algorithms provide both data security and integrity. While a number of AE algorithms exist, they can prove inefficient and difficult to use. Recent efforts have focused on the development of secure, efficient and easy to use AE algorithms. MK-3 is one such algorithm; developed through a joint effort between Rochester Institute of Technology (RIT) and the Harris Corporation. The algorithm uses the duplex construction, which builds on the sponge primitive popularized by Keccak, the SHA-3 competition winner. MK-3 is intended for hardware implementations; its novelty is the use of 16-bit substitution boxes as opposed to the 8-bit set used by the Advanced Encryption Standard (AES). In this paper we introduce a fully parallel hardware implementation of MK-3 on Field Programmable Gate Arrays (FPGAs) as well as lay the groundwork for future design optimizations.

Automated People Mover Design and Implementation – Ptucha, Raymond et al.

It is no longer a question *if* self-driving cars will transform society, but when. By the mid-2020's, most agencies predict autonomous driving will transform the automobile market. Because of safety, manufacturing costs, and limitations of current technology, autonomous off-road vehicles, such as people movers in large industrial or academic institutions, will probably emerge before autonomous high-speed highway driving. A three year multidisciplinary capstone project is underway which will transform a golf cart into an autonomous people mover. This paper will describe several factors to consider when forming capstone engineering student design teams in academia, and then discuss specific issues in sensor selection and integration when designing an autonomous vehicle. Detailed design considerations and safety issues, along with the actual steps and parts necessary are covered. The paper will conclude with the year three plans to convert the golf cart into a fully autonomous people mover and beyond.

Fault Tree Reliability Analysis of Network Configurations in Cybersecurity Intrusion Detection Systems – Egarievwe, Stephen et al.

Intrusion detection and protection systems are used to prevent attacks in neighborhood area networks of infrastructures such as smart grids. Real time Intrusion Detection and Prevention Systems (IDPS) serve as a promising solution to detect and possibly prevent a broad range of security related violations. This study focuses on communication network configurations with IDPS placed at the nodes. The goal is to analyze and compare the reliability of four basic configurations of collector communication networks: ring, star, tree, and mesh topologies. The analysis includes the development of fault tree for each network topology, finding the minimum cut-sets, and calculating the exact top event probability. The results where each network configuration has 4 nodes show that the full mesh and star network topographies tie at best with the lowest top level fault probability. The tree network has the worst fault probability. Scalability analysis showed that the full mesh network is the best while the ring network is not scalable.

Network Security via Cryptographic Validity - Carranza, Aparicio et al.

Computer and network security is one of most important areas of study nowadays. People all around the globe are using this method of communication for email, chatting, games, transfer of information, and other uses. Although this technology sounds wonderful, there is a downside to it as well. The Internet involves people with malicious intentions and the use of malware. It is for this reason that the studies of computer networking and security have been emphasized within the last few years. One solution for combating malwares and other threats traveling within the Internet is the use of cryptography. In this research we will explore some of the cryptographic techniques using hardware/software solution modules to verify the robustness of block ciphers mode, data encryption standard, advanced encryption standard, classical transposition ciphers, public and private key ciphers, and RSA as it applies to network security.

Measure Twice, Design Once: Using LEED to Benchmark Neighborhood Development
A Case Study in How Evidence-Based Inquiry Can Inform Urban Design Decisions –
Dean, William

The relative success or failure of traditional fine arts such as painting, sculpture, music, poetry and architecture has primarily been based on a subjective analysis of aesthetic qualities alone. Architecture, in particular, is difficult to evaluate because it straddles the line between fine art and applied art due to the requirement that it also serve a practical function. Thus, what constitutes “good” architecture or, for that matter, good urban design, is as challenging to define as it is to measure. There is a growing body of research devoted to measuring the design quality of neighborhoods, towns and cities. One common standard is the Leadership in Energy Efficient Design for Neighborhood Development (LEED ND) rating system that examines developments in terms of nearly 50 desirable design characteristics. This paper uses a case study methodology to examine the process of assessing the existing conditions of a neighborhood relative to LEED ND, proposing design solutions to strengthen the observed weaknesses, and re-evaluating the final design proposal using the same instrument.

Track 2 Abstracts

Technology Innovations Impacting ET Education

Closing the Gap: The Need for Women and Minorities in Cybersecurity – LeClair, Jane

Those with a vested interest in cybersecurity are well aware of the many challenges that are faced by those working in the cyber arena. One of the more difficult challenges is finding, in adequate numbers, well trained and educated personnel to fill the many open positions that currently exist in the field. Compounding the issue of vacancies is the paucity of women and minorities in the STEM and cybersecurity field. This presentation will provide an overview of the current status of cybersecurity, the expanding need for cyber warriors, and the role that women and minorities can and should be playing in the field.

Material Chemical Mitigation Through Zoning and Landscaping Towards Understanding Sustainability Within the Site – Davis, Edward

A well designed building must include good mitigation measures to remediate against chemical spread from building materials beyond property lines. Zoning, natural landscaping and gradient can demonstrate sustainable practices with construction materials and drainage that can be made easily to explain. Beginning with the precipitation cycle when water strikes and drains off buildings entering into the environment going beyond the property as an overland flow to distant surface waters or by infiltrating and percolating below to aquifers and wells. Materials, i.e.: wood, have undergone improvements with treatments and finishes with more environmentally friendly chemicals towards making them safe to use within the environment. Zoning regulations surrounding landscape and gradient are tools that can be used to mitigate chemical spread. Soil particles become the “free ride” where chemicals attach only to be carried away by surface runoff to points far and wide. Aesthetics lead towards minimizing chemical spread through plant phytoremediation (root systems that absorb chemicals) along with slight contour/gradient manipulation to contain. Chemical spread mitigation promotes sustainability by addressing a potential menace if left unchecked. In this article, these conditions and concerns begin to piece together an easy to follow discussion giving light towards understanding a complex topic that begins at the individual house or building regardless of size. This may also remind experienced Design Professionals of their stewardship roles within the environment.

Design Principles for Defense-in-Depth – Wolff, Josephine

Notions of defense-in-depth in computer security span a range of different meanings and design architectures, many of which are drawn from historical analogies. The inconsistent application of the idea of defense-in-depth and the imperfect analogies that are used to frame it in the context of computer systems have led to a great deal of confusion around what it actually means to implement “defense-in-depth” in practice. In this paper, we review the different design principles that have been suggested and adopted by computer scientists under the umbrella notion of defense-in-depth and explore how their historical origins have shaped their application to computer systems.

Dimensioning Strategy for Introductory Computing Graphics Students – Longwell, John
Computer aided drafting (CAD) technology has made placing and moving dimensions effortless. The price for a dimensioning error (incorrectly placed, over dimensioned, etc.) is simply to click it and fix it. The student's tactic often is to place as many dimensions as possible, then submit the drawing for the instructor to critically evaluate it. While the dimensioning rules may seem endless to a beginning student, they need some criteria for them to use. Professor Longwell will outline a strategy for students to use while they are dimensioning. This strategy, based on the concepts of GD&T, gives the student the ability to critically evaluate the dimensions while they are creating them. This will be a true workshop that you should be able to learn and apply in your graphics communication courses.

Adaptable Technologists for High-tech Ecosystem – Samanta, Sam

Our model of Engineering Technology education at Finger Lakes Community College (FLCC) adapted to high-tech ecosystems across the US will accelerate workforce training for 100,000 hard-to-fill technical jobs; and prepare 21st century workforce pre-adapted for disruptive innovations in the IoT era. We will share details of our innovative curriculum, AAS Instrumentation and Control Technologies (ICT) curriculum for teaching fundamental concepts in automated data acquisition, motion control and machine-vision, robotics, process control, and quality monitoring to prepare students for high-tech employment across the whole spectrum of industries. We will discuss the key factors contributing to 75% student retention (for the past three cohorts of about 9 students each) and our success in facilitating learning of mathematics, and physics through use of "Visual Apps" designed using Excel and LabVIEW. We will share how we collaborate with three dozen high-tech businesses in the region near Rochester, NY and work with National Instrument, the leading provider of engineering tools and learning resources, to create a framework for educating technologists critical for designing, testing, manufacturing and quality control across a broad spectrum of high-tech industries. Find out how the hands-on curriculum at Finger Lakes Community College blends a systems approach to adaptable technical education to prepare students for high-tech employment.

The Evolution of Student Work Product in Construction Management Courses in the Construction Management Curriculum at SUNY College of Environmental Science and Forestry
– Tiss, Kenneth

This paper will take a brief look at how one instructor has dealt with the evolving changes in the construction and construction management businesses over the last twenty five years. As the demands that have been placed on construction companies during this time period have increased and how technology has evolved and become incorporated into the business, the skills required for their employees have changed. As a result educational programs in construction and construction management have had to change as well being the main suppliers of new employees. The personal journey of one instructor at SUNY College of Environmental Science and Forestry will be described over this time period. The paper will discuss how the instructional objectives have had to change and what those changes have meant to the students and the work product that they have been asked to produce over this time period. Upon completion of this paper one should gain a grasp on what changes have occurred and the author will attempt to provide a look into the future years to project what might be coming next.

Track 3 Abstracts

Access Technologies and Innovations

Automatic Speech Recognition Systems as Tools to Enhance Spoken Communication in the Classroom – Gottermeier, Linda et al.

To investigate the capabilities of newer Automatic Speech Recognition (ASR) applications/software as tools to support auditory access of spoken communications, we asked 26 deaf and hard-of-hearing college students to use a variety of applications and software in real-world (field) settings and to provide evaluative feedback. In this presentation preliminary findings will be shared.

Additionally, participants will learn about a new beta application called Ava by Transcense Labs. Ava focuses on a seamless conversational experience for deaf and hard-of-hearing persons and is described as being like Siri, but for group conversations. The app processes conversations to show a real-time, color-coded transcript.

Innovative Solutions using 3D Kinect - Trager, Brian et al.

In the past decade, technology has enabled new ways to gain access to information especially for the deaf and hard-of-hearing community. A team at NTID's Center on Access Technology (CAT) has created an innovative solution utilizing the advances of 3D technology sensors built into the second-generation Kinect. While Kinect was created for the purpose of gaming, we were able to extend its capabilities to push the boundaries of accessibility in today's world. The team at CAT devised a system comprised of a Surface Pro, Kinect, and a projector to track a person, whether it be an instructor or speaker and project real-time captioning approximate to the person. The combination of body tracking and coordinate mapping has essentially created a greater degree of accessibility for an audience with captioning needs. While this project is still being researched in areas of accessibility benefits, this topic will focus on the technical aspect of the system and the inspiration for this innovative project. A real-time demonstration of the system will be part of the presentation.

Using C-Print Mobile in Postsecondary STEM Labs - Stinson, Michael et al.

This presentation will describe the C-Print® speech-to-text service for facilitation of communication access for deaf (and hard of hearing) students and highlight newly developed C-Print Mobile technology. C-Print Pro transforms phonetics-based abbreviations into full words on the computer screen and produces a real-time display that the student can read on various tablet, Smartphone, laptop, etc devices. The new C-Print Mobile app allows users to view captioning in a variety of settings, for example, in traditional classrooms, labs, meetings, and even in remote settings, such as a classroom field trip. C-Print Mobile was developed partly to incorporate advances in technology, and also to enable C-Print to effectively meet deaf students' communication access needs in situations where it has not been possible to effectively provide services with standard laptops. The presentation will demonstrate how C-Print Mobile works, including use of different options in the app. The presentation will also briefly share findings from a study that evaluated the effectiveness of C-Print Mobile in STEM labs.

Accessible Smart Home System for Deaf and Hard-of-Hearing – Stanlislow, Joe et al.

Currently smart home systems are not accessible to deaf and hard-of-hearing (DHH) residents. The purpose is to build a notification system that can be integrated with smart home systems. It will allow DHH people to be notified when appliances produce sounds in a home environment. The Internet of Things (IoT) platform is used to provide engineers a development environment which allows them to develop a cost effective and customizable application for different possible accessibility solutions that will benefit the DHH community. Consumer demand is driving adoption IoT as the new technology to improve home, energy savings and safety that will make new things we haven't even thought of yet. The IoT is based on a powerful embedded controller with Bluetooth and Wi-Fi technologies. These technologies can ultimately be used to improve access to a wide variety of electronic and communication devices. Because of on-going development of specific solutions for the accessibility needs, it reduces the development cycle by creating a common platform as a base for most solutions. The benefits of low cost, small physical footprint and the ability to move from research to commercialization will be discussed.

Optimal Viewing Distances for Deaf Students – Beiter, Karen

The Americans with Disabilities Act mandates aural--to-visual access for Deaf/Hard of Hearing students who request these accommodations. These students must either watch the accommodations close and clearly, or be far away to see everything but not clearly. We tested an automated tracking video system that enables video to be captured close-up and clearly. We set this up such that the pan--capable camera does not rely on any classroom infrastructure, or any special accommodations by the lecturer. We present the results of a study evaluation of two videos, one at 5 feet with pan/zoom, and the other at 10 feet.

Track 4 Abstracts

STEM Education

Breakout Session – Yerrick, Randy

Science and Engineering teaching in higher education has long been dominated by traditional models of lecture, lab and an occasional demonstration or activity. Many other kinds of pedagogical models are becoming available and popular among STEM professors. Come and engage in conversations with experts who are transforming their teaching practices to make their classroom environment more engaging, more challenging, and more equitable. (45 minutes, Mixed format: Expert Panel, Pedagogical Demo, Virtual Examples, and Q&A)

Encouraging Deaf and Hard-of-Hearing Student Involvement in Undergraduate Research in the STEM Fields – Pagano, Todd

The current emphasis on undergraduate research by students in chemistry and other STEM programs is exciting. Student-centered scholarly efforts to conduct original investigations that help to promote student learning while contributing to the scholarship of the discipline are often scarce for students in community colleges or at the Associate's degree level and also for Deaf and Hard-of-Hearing students. Nevertheless, these groups of students can find success with undergraduate research and faculty can find ways to provide the valuable experiences. This presentation aims to share examples and advice for implementing undergraduate research activities for Deaf and Hard- of-Hearing students, and especially those in the first two years of their college education.

Doing Physics Experiments with Students in the Virtual World of Second Life – Robinson, Vicki
First, there were illustrations in the textbook. Then there were filmstrips. Later came downloadable videos and Java applets. All of these visual representations of physical phenomena are helpful additions in a physics teacher's arsenal. None of these are, however, interactive in the truest sense. Students can't walk around things, push buttons, take data in response to parameters that they set. Physics classes at the National Technical Institute for the Deaf at RIT are now able to fold their lab experiences into their homework in new ways, using the virtual world of Second Life. This presentation will demonstrate how the NTID physics students are doing physics homework in the 21st Century.

STEM Education in the 21st Century: Creating a Virtual Community of Practice for STEM Learners – Elliot, Lisa and Easton, Donna

This presentation will describe the Deaf STEM Community Alliance's virtual community of practice for students, faculty and professionals who are deaf or hard of hearing and whose interests or careers are in STEM fields. The Alliance developed the Deaf and Hard of Hearing Virtual Academic Community (DHHVAC) to address three types of critical barriers to the success of students who are D/HH: 1) student preparation; 2) socialization; and, 3) accessible media. Using an incremental and iterative model-building strategy, the community evolves in response to members' needs. Many college courses now implement some online forum to augment coursework. While this course-based forum may increase dialogue or socialization for the specific course, students who are D/HH and other students with disabilities are frequently isolated on their campuses. In their isolation, these students may not know like-minded peers who

share their academic interests. Additionally, these students may be challenged academically. Through innovative use of online resources, the DHHVAC addresses these challenges. This presentation will describe the various ways that the DHHVAC reduces isolation and improves access to STEM information by increasing interaction with other students, D/HH professionals, and hearing allies. The presentation will describe features of the DHHVAC and why the components and particular tools were selected, as well as challenges faced in developing this model. This presentation will be useful for anyone who is searching for new ways to connect to students with diverse learning needs.

Using MATLAB for stability analysis in Controls engineering – Hagigat, Cyrus

Analyses of control systems require solution of differential equations. Such solutions demonstrate performance in time domain and are used for determining stability boundaries. However, solving the differential equations for moderately complex control systems without use of numerical techniques is at times impossible. MATLAB can be used to solve differential equations and MATLAB can be used to quickly construct a Root-Locus plot for a control system that determines the stability boundaries for the control system without the need to solve the differential equations. This article demonstrates use of MATLAB for both solving system differential equations and constructing Root-locus plots.

Semi-Flipped Learning Modules with Educational Design Patterns in Interdisciplinary Brain-Inspired Computing Course – Kudithipudi, Dhireesha

A new multidisciplinary Brain-Inspired Computing course is developed for students majoring in Computer, Electrical and Micro- Systems Engineering. This interdisciplinary course entails short learning modules from Neurophysiology, Machine Learning, VLSI Design, and Computer Architecture and serves as an ideal candidate for a Semi-Flipped learning model. Such student-centric learning model enabled active student participation, enhanced critical-thinking development, and improved learning outcomes. For the first time, educational design patterns were also introduced in a multi-disciplinary engineering curriculum to enable expert domain knowledge models. This paper presents the motivation and methodology for these models along with the software video-based learning modules developed.

Poster Abstracts

Undergraduate Research: Comparison of quantification methods for Kjeldahl protein digestions of wild fruits – Berroa, Elder et al.

Migrating birds depend, in part, upon local wild fruits to get needed nutriment for energetically-costly long distance migrations. We have studied several nutrients in local wild fruit supplies in our laboratory, but this study represents our first protein measurements. Traditional Kjeldahl digestions were performed first on ‘model proteins’ and wild fruits found in Rochester, NY. After Kjeldahl digestion, ‘model proteins’ and fruit samples were quantified for protein content with a traditional titration method and also using an automated total nitrogen analyzer. Both quantification methods performed well for different analyses, and results of the two methods were compared.

The Combination of BeagleBone and Kali Linux for Wireless Network Attacks – Carranza, Aparicio et al.

What type of data or sensitive information can we lose if an unauthorized person gains access to our network? Consider the types of confidential information that could be obtained and carefully analyzed if a hacker is sniffing/tracing packets of data being posted from your device. Securing data is one of the main services provided by Kali Linux, this is the Operating System (OS) used for our research efforts. Specific tools offered by Kali Linux such as Ettercap-Graphical, Wireshark, Aircrack-ng, and ARP poisoning are used to perform in-depth our practical research of penetration testing. The testing will be performed using an ARM micro-processor contained within the BeagleBone Black (BBB) microcomputer systems board. Therefore, Kali Linux and its security tools can be accessed using BBB and it will be a portable ethical hacking device. The outcome of our effort will show gathered data such as ID’s, usernames and passwords obtained from a website by performing a Reconnaissance attack. Also, de-authenticating another host’s wireless access will be performed by a Denial of Service (DoS) attack.

Integration of experiential learning to develop problem solving skills in deaf and hard of hearing STEM students – Dannels, Wendy A. et al.

We present an experiential approach to improving problem-solving skills in DHH students. Students utilize a highly structured methodology adapted from industry to step through a series of problem-solving case studies. Students work on teams within a state-of-the-art laboratory that simulates real-life engineering problems.

Creating Tools for Learning Statistics: Project Summary and Perspective of Student Researchers - Chapple, Kiara et al.

This exploratory project is investigating the potential of Supplemental Online Learning Tools (SOLTs) that integrate visual representations of complex concepts with signed explanations to enhance the academic success of deaf and hard of hearing (DHH) students in foundational statistics courses. Visual/graphic and textual representation of concepts will be accompanied by sign language, voice and captioning. A diverse team of hearing and DHH instructors, tutors, and students collected input from multiple sources to select an initial course topic to address, developed a lesson plan and materials using a universal design approach, and are using an iterative process of evaluation and revision to create the first SOLT. In this poster, undergraduate

student researchers provide a project summary and reveal how working on the project has impacted them.

Comparison of the Electrical Engineering Software Programs ETAP 12.6 and PowerWorld Simulator 18 to Assist in Power System Design – Nadolinski, Kyle

Power Systems design and engineering involves the successful calculation of individual component sizes and ratings while taking into consideration power system requirements and capacities. Electrical engineering simulation software provides a useful tool to verify the viability of both an individual component and entire power systems. In addition, the programs allow for efficient calculation of important processes relevant to the design considerations of a power system such as power flow analysis, short circuit current analysis and voltage drop calculations. The programs ETAP 12.6 and PowerWorld Simulator version 18, allow electrical engineering and electrical engineering technology students a method to build power systems in a one line diagram, specify relevant information and parameters, and then test their designs. Power systems will be built based on specified parameters, and then its operation simulated using the ETAP 12.6 and PowerWorld Simulator 18. Results and findings will be compared.

An Undergraduate Research Program for Deaf and Hard-of-Hearing Science Students – Ross, Annemarie D. et al.

Deaf and Hard-of-Hearing science students, who began their scholarly work at the Associate's degree level, share their results from, and perspectives on, conducting scientific research. Our program provides students with opportunities to learn discipline-specific information while performing cutting-edge research, contribute to the scholarship of their field, and work on projects utilizing the instrumentation they learn in the Laboratory Science Technology program. The students provide a point-of-view on being involved in undergraduate research and working on real-world topics such as fruit and tea biochemistry.

Undergraduate Research: Measuring components of tea using multidimensional fluorescence spectroscopy with chemometrics – Sankoh, Amie et al.

Tea contains highly fluorescent phenolic compounds that largely contribute to its antioxidant capacity. Multidimensional fluorescence spectroscopy with the chemometric tool, parallel factor analysis (PARAFAC), was investigated as an alternative to the traditional Folin-Ciocalteu reagent method for total phenol quantification and the Trolox Equivalence Antioxidant Capacity (TEAC) assay for total antioxidant strength. The fluorescence technique shows potential of being able to provide information beyond total phenol concentration and antioxidant capacity by revealing the spectral characteristics of different forms of phenols in tea samples that have importance in health and diet applications.

Design of a Transient Stable Droop Controller for Inverter Interface Devices – Yue, Lu

Current Microgrids normally have two modes of operations: grid-connected mode and stand-alone mode. In the stand-alone mode, the control of the inverter-interface devices is of critical importance due to the wide use of such power electronic technology. Droop control serves as an advantageous control scheme because of its independence from relying on complicated and expensive communication devices. This paper presents a design of a transient stable droop

controller. Simulations show that the controller is able to maintain system stability during the transition when the load changes.

Deaf and Hard of Hearing Online Learners in Postsecondary Education: Student Perspectives on Best Practices – Long, Gary et al.

This research study was undertaken to evaluate the experiences of deaf and hard-of-hearing (D/HH) students who were enrolled in online college courses and to determine what the optimal or “best practices” would be for online instructional delivery to this population. Nine students with a hearing loss participated in an in-depth interview in one of two separate groups sharing their experiences in their online classes. For effective instruction, it was found that faculty and students need to follow recommended best practices to optimize the D/HH students experience and learning in an online class.

Test Bed for a Cyber-Physical System (CPS) Based on Integration of Advanced Power Laboratory and eXtensible Messaging and Presence Protocol (XMPP) – Meskin, Matin et al.

Many attempts have been done before in development and application of smart grid. Herein, a novel idea of power network real-time monitoring is presented. The idea is based upon the integration of SCADA, Cyber-Physical System (CPS) and XMPP protocol. To test this idea, a test bed has been established in Smart Grid Laboratory at SUNY Buffalo State in joint with University at Buffalo. It includes a model of long-distance transmission line combined with protective relays. Information of the system state is collected from Smart Grid laboratory sensors (smart meters and relays) using SCADA system and transferred via MODBUS TCP protocol to Master SCADA system. Finally it will be accessible on smart devices by authorized personnel utilizing XMPP protocol.

Exhibitor Abstracts

Cyber Security Essentials - Concepts and Practices, by Sheering, Ned, Director Sales and Business Development Allegheny Educational Systems, Inc.

The presentation will cover topics that Information Technology instructors, department supervisors, and school administrators should know about teaching **Cyber Security Essentials**, including:

- Increasing demand for I.T. professionals in general, and Cyber Security professionals specifically
- Cyber Security careers in today's job market
- Understanding the *Cyber Security Frameworks*
- How to prepare for the ISACA *Cybersecurity Fundamentals Certificate Exam*
- Curriculum and equipment available for schools to teach Cyber Security Essentials
- Funding opportunities for schools to implement Cyber Security Essentials programs

Intrusion detection software (IDS), by Oliva, Ricardo, Director Engineering – US Edibon

Network security is crucial today in many systems not least in public utilities. If you can trust your data integrity then efficiency and streamline core operations improve. Focus will be on Electrical Smart Grid in the power industry, the focus has been on implementing equipment that improves power system reliability. It's a different world today. Communications and IT equipment were typically seen as supporting power system reliability. Increasingly, these sectors are becoming more critical to the reliability of the power grid.

Increased multi-faceted connectivity of **Supervisory Control and Data Acquisition**, (SCADA) systems in Smart Grids potentially means only a greater threat to serious mal intent. SCADA systems with the previous standards of communication infrastructure have inherent cyber-security weaknesses as these systems were originally designed with little consideration of cyber compromises. We must now add on intelligence components to the existing SCADA systems with minimum hardware cost or operational changes. At this level, the industrial and academia control security community have also begun to delve into Intrusion Detection Systems in theory as well as in practice.

Prevention is best combined with detection and response. A well planned implementation and deployment of an Intrusion Detection System (IDS) should introduce itself as an “easy” add on as the intelligence component to the existing SCADA systems with minimum hardware cost or operational changes in an electrical plant to continue with main power generation as usual.

Based on hindsight observations:

A middleware framework has access to the communication packets between the distributed objects within the system. Research in this area continues to improve IDS performance.

This is being accomplished with help from a university in Washington near Pullman, working with local software partners of SEL where the modules for this unit are manufactured. Also from Cisco with IDS routers and ware.



EDIBON USA MPSS SMART GRID with IDS SCADA

RIT's School of Individualized Studies (SOIS), by Cantwell, Amy, 585-475-7297 email ambcada@rit.edu.

The School of Individualized Study (SOIS) offers students a unique degree and learning opportunity of when, where, and how they engage in their education. Part of a nationwide network of individualized degree programs and experimental liberal arts environments, SOIS self-consciously promotes learner autonomy in the customization of a professional curriculum, and directing the overall higher-education experience. In this environment, the student simultaneously becomes a stakeholder in and consumer of their degree. This individuation process, in collaboration with guidance from a professional and faculty advisor, permits the student to understand the impact that their course and experiential learning choices will have on their immediate and continuing educational and career goals. Graduates of individualized study programs — regardless of whether they shape careers around their distinctive degree concentrations — report high degrees of satisfaction with the educational choices they made and well-prepared for changing workplace environments and the need for continuous self-improvement.

After Dinner Presentation

The IMAX Laser Projection System: From 0 to Insane in Under 2 Years – Silverstein, Barry

Out of the ashes of Kodak's Entertainment Imaging business was born the world's first cinema-quality laser projection prototype. Learn about the creation of the newly formed IMAX business unit, IMAX Rochester. Follow the technical journey (adventure) of taking a prototype 10,000 lumen, 2k resolution laser projector and turbo charging it to deliver six times the brightness in order to light screens that are more than 100 feet wide at 4k resolution. The projection system born out of this effort is currently delivering stunning images at IMAX's most iconic locations around the globe.... a mere two years later. The revolutionary optical-mechanical system is unlike anything ever built for a projector and was designed in Rochester. It is currently in production in Canada by a simultaneously created custom assembly line. IMAX, in conjunction with local suppliers, managed to deliver this system on time while working across three countries and two continents. The performance of this system has exceeded expectations and is receiving accolades from the industries experts.

Biographies

Ali, Shareef

Shareef Ali is a 4th year Computer Science in the Golisano College of Computing and Information Sciences at RIT. He has been working for the Center on Access Technology (CAT) as a software engineer for over two years. During that time, he has worked with open source software projects, an ASL storybook app, and the Real-Time Tracking Display (RTTD). He currently works for VTCSecure on the Accessible Communications for Everyone project funded by the Federal Communications Commission.

Bastian, Bonnie L.

Bonnie L. Bastian, MS, is a speech-language pathologist in the Department of Communication Studies and Services at the National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY.

<https://www.linkedin.com/in/bonniebastianSLP>

Steve Beaudry

Steve Beaudry has over 20 years of experience in applied technology as a Field Service Engineer, IT Systems Analyst and Sales Executive for Technical Education programs across the country. He has degrees in Electronics Engineering and Automated Manufacturing Technologies. Steve has presented on Cyber Security Essentials to teachers and school administrator across the United States.

Behm, Gary

Gary Behm is an Assistant Professor of the Engineering Studies department and Director of the NTID Center on Access Technology Innovation Laboratory at NTID. He is a deaf engineer who retired from IBM after serving for 30 years. He received his BS from RIT and his MS from Lehigh University.

Beiter, Karen

Karen Beiter is an Assistant Professor/Program Coordinator at NTID/RIT. In addition to teaching a variety of computer related courses, she provides tutoring to cross-registered deaf/hard-of-hearing students studying for baccalaureate degrees. Her primary area of research is in classroom accessibility for deaf/hard-of-hearing through evolving technology especially utilizing mobile devices.

Bempong, Joan

Joan Bempong, a native of Irving, Texas, is a student currently pursuing BS/MS degrees in Computer Engineering at RIT. She transferred from the University of Texas at Arlington where she realized she would like to be involved in a career post-graduation improving the deaf and hard-of-hearing community through technology.

Berroa, Elder

Elder Berroa is a graduate of the Laboratory Science Technology program at the National Technical Institute for the Deaf and is currently enrolled in RIT's Chemistry program. He completed a co-op with Dow Chemical and received the Outstanding Chemistry Student Award from the Rochester Section of the American Chemical Society.

Biviano, Nathan

Nathan Biviano is a 5th year student in the Industrial and Systems Engineering department at Rochester Institute of Technology, currently working towards a Bachelor's of Science degree. His areas of interest are statistical quality control, technology and automotive production systems. Nathan has spent four co-ops with GlobalFoundries, where he will return full time after graduation.

Blatto-Vallee, Gary

Gary Blatto-Vallee is a Senior Lecturer of mathematics in the Science and Mathematics departments at the National Institution for the Deaf. Academic and research interests include math education for the deaf and hard of hearing individuals, developmental mathematics education, and adult education. He is also Senior Personnel on the NSF Thinking CAP project.

Carranza, Aparicio

Associate Professor at CUNY – NYCC Technology, Brooklyn, NY and Adjunct at SUNY – New Paltz. His research interest involves CyberSecurity & Technology Education, SDN, Virtualization and Cloud Computing. He serves as an Advisory Council to Vaughn College of Aeronautics, DeVry University, TCI College; and Rockland Community College all in NY. He was chair of his department for six years (2007 – 2013). Dr. Carranza has a PhD from The Graduate School of CUNY, MSEE & BSEE (summa cum laude) from CCNY – CUNY; and AAS (summa cum laude) in Electronics Circuits and Systems from TCI of NY. He also worked as an Engineer Scientist for IBM Corp. For the past 15, he's been with NYCC of Technology.

Carranza, Harrison

Adjunct Instructor at CUNY – NYCC of Technology. Mr. Carranza has earned his Bachelor's Degree in Computer Engineering Technology from CUNY - NYCCT (magna cum laude). He has conducted research as an undergraduate student and presented his work at various conferences since 2010. Currently, he is a graduate student on track to obtain a Master's degree in IS at Marist College in Poughkeepsie. He has also taught at SUNY DCC as a summer camp instructor to elementary and high school students where he taught them Robotics and Programming.

Chapple, Kiara

Kiara Chapple is a 5th year psychology student at Rochester Institute of Technology who is very interested in research in a variety of areas. As a student researcher, she is assisting in development of methods to improve learning for deaf and hard of hearing students and help the professors who teach them.

Cheng, Skinner: Co-Founder and CTO of Transcense Labs

Skinner has been deaf since the age of 2 and currently communicates primarily through text and written notes. He has an MS of Computer Science from the University of San Francisco and has 10 years of experience in software engineering, and Android and iOS mobile development. Skinner also has experience with artificial intelligence and machine learning. He worked at two startups, HyperTech and Vigo, before starting his MS in Computer Science and joining Transcense. Skinner applies his ingenuity in mobile technologies to help hard of hearing people like himself, to get better access. With the team, he built the fastest captioning system in the world today.

(<https://www.linkedin.com/in/skinner7717>)

Coble, Jamie

Jamie Coble has PhD in Nuclear Engineering. She is a nuclear engineering assistant professor at the University of Tennessee, Knoxville. Her research is in empirical modeling methods for process and equipment monitoring, anomaly detection and diagnostics, and prognostics.

Cuevas, Ronny

Ronny is a fourth year NTID/RIT student from New Jersey. He was born in the Dominican Republic. Ronnie's major is Information Computer Studies. He will graduate in May, 2016. Ronny is actively involved in the Latin American Deaf Club, serving as the treasurer, Vice President and President from fall 2012 until now.

Daigneau, Madeleine

Madeleine Daigneau is a 5th year student at Rochester Institute of Technology in the BSMS program of the Computer Engineering department. Her interests include software programming, computer vision, and machine learning. She's had cooperative education assignments with Corning Tropol out of Fairport and Orthoclinical Diagnostics out of Rochester.

Danko, James

James Danko is a 5th year Electrical Engineering student with the electrical engineering department. His areas of interest are controls systems automation, sensors integration, and robotics. He has co-oped with Rovisys, an automation consulting firm. When James graduates he would like to pursue a career in manufacturing automation.

Davis, Edward T.

Edward T. Davis is an Assistant Professor in the Department of Engineering Technology at Queensborough Community College where he teaches courses in Architecture, Construction, and Technology. He has received a BS in Architectural Technology and MS in Energy Management from New York Institute of Technology in Old Westbury, NY in addition to being a New York State Registered Architect. Resides in Farmingdale, NY and Front Royal, VA. Outside of pursuing educational interests he will be found collecting postcards related to US scenery and out running and training for his next 26.2 mile marathon event.

De Filippo, Carol L.

Carol L. De Filippo, PhD, is a professor of audiology in the Master of Science Program in Secondary Education of Students who are Deaf and Hard of Hearing at the National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY.

Dong, Kevin

Kevin Dong, a 3rd year RIT student in Information Technology. As student research assistant, he is responsible for providing feedback and evaluate improvement on a topic that most deaf and hard of hearing students struggle with in the statistics course.

Doevendans, Pieter: Founder and COO of Ava

Pieter received his Bsc. in civil engineering from the University of Technology Eindhoven, The Netherlands. While pursuing his MSc degree in Innovation Sciences at UC Berkeley, he started two companies; one being a smart and low cost innovation to save premature and ill babies in rural third world hospitals. As the COO and co-founder of Ava, Pieter has been hugely important for the business and customer relations created. Besides that, Pieter is experienced with hardware and brings amazing creativity to the table. Pieter spends most of his time engaging with users, partners, advisors, and mentors. Internally he is responsible to drive the management team, and make sure that the product testing takes place. As a Kairos and Resolution Project fellow, Pieter has received many honors & awards.

<https://www.linkedin.com/in/pieterdoevendans>

Duchemin, Thibault: Founder and CEO of Ava

Born a CODA, as the only hearing person in a Deaf family, Thibault has set out to break communication barriers between the deaf & hearing world since 5 years old and has never stopped since. A French Data Scientist, Thibault holds a double Master from both Paris's first engineering school, Ecole des Ponts-et-Chaussées and UC Berkeley's College of Engineering. As Founder and CEO of Ava, a smart, always available captioner for everyday group conversations, Thibault has been advocating for total accessibility for deaf and hard-of-hearing people and has been named one of Inc.'s Top 50 Emerging Global Impact Entrepreneurs. His story has been covered in Forbes by Steve Blank. <http://www.forbes.com/sites/steveblank/2015/04/30/can-you-hear-me-now/>

www.twitter.com/t_duchemin (<https://www.linkedin.com/in/thibaultduchemin/en>)

Easton, Donna

Donna Easton is Research Assistant, Center on Access Technology, National Technical Institute for the Deaf. She has been involved in C-Print research for 16 years, and has worked as a provider of C-Print services in research studies.

Egarievwe, Stephen

Stephen Egarievwe has PhD in Applied Physics. He serves as Director of the Nuclear Engineering and Radiological Science Center Alabama A&M University. His research areas include nuclear radiation detectors; data analytics for homeland security applications; and reduction of cybersecurity vulnerability and attacks at nuclear power plants.

Elliot, Lisa

Lisa Elliot is PI for the Deaf STEM Community Alliance Project and Senior Research Scientist, Center on Access Technology (HRD 1127955). Since 1996, Elliot has been a researcher, co-PI or PI on more than nine federally- and privately-funded studies related to C-Print real-time captioning and other technologies.

Foster, Susan

Susan Foster has been a Professor in the Masters of Science Program in Secondary Education at RIT for over 20 years. Her research interests include education models and access to learning for all students in mainstream settings, including those who are deaf or hard of hearing. She is co-PI on the NSF Thinking CAP project.

Francis, Pamela

Pamela Francis is Coordinator of C-Print Development, National Technical Institute for the Deaf. She is co-inventor of the C-Print system and has in-depth knowledge of speech to-text technology including direct service implementation. She oversees the development of the C-Print Pro software and C-Print training at a national level.

Goss, Connor

Connor Goss is a 5th year Computer Engineering student at Rochester Institute of Technology, currently working towards a Bachelors/Masters dual degree. The areas he is focused on include computer vision and embedded software development. Connor has spent four co-op terms at Codonics in Cleveland OH, working with embedded firmware, web application, and Java application development.

Gottermeier, Linda G.

Linda G. Gottermeier, AuD, is associate professor of audiology in the Department of Communication Studies and Services at the National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY.

(<https://www.linkedin.com/in/lindagottermeier>)

Grant, Jacob

Jacob is third year student from Small Island in Maine, pursuing his AAS degree in Information and Computing Studies. He enjoys the areas of PC Hardware and web development and would like to pursue that field upon graduation.

Grinberg, Ilya

Ilya Grinberg graduated from the Lviv Polytechnic Institute (Lviv, Ukraine) with an M.S in E.E. and earned a Ph.D. degree from the Moscow Institute of Civil Engineering (Moscow, Russia). He has over 40 years of experience in design and consulting in the field of power distribution systems and design automation. He has over 40 published papers. Currently he is professor of engineering technology at SUNY Buffalo State. His interests are in the field of electric power distribution systems analysis, design automation, and systems engineering.

Hagigat, Cyrus

Dr. Hagigat is an associate professor in the college of engineering of University of Toledo, and he is teaching engineering technology courses. He has an extensive industrial background, and he is continuously emphasizing the practical applications of engineering material covered in typical engineering technology courses.

Hintz, Austin

Austin Hintz is a 5th year student in the Electrical Engineering department at the Rochester Institute of Technology, currently working towards a Bachelor's of Science degree. His areas of interest are renewable energy, schematic design for controls automation, and electrical integration. Austin has worked as an Electrical Integration Co-op for Xerox Corporation, as an Electrical Controls Co-op for KeurigGreen Mountain Incorporated, and as an Electrical Controls Co-op for Machine Tool Research. Austin expected graduation date in December 2015.

Jackson, Jane

Jane Jackson is an assistant professor in NTID's Department of Science & Mathematics, has worked for over 23 years as a faculty tutor with deaf and hard of hearing college students in math, statistics and electrical engineering courses, and is interested in research in deaf education. She is co-PI on the NSF Thinking CAP project.

Jang, Sunghoon

Associate Professor and Department Chair of Computer Engineering Technology at CUNY – NYCC Technology. He received his BSEE, MS, and PhD in Electrical/Biomedical Engineering from KyungNam University in Korea, NJIT, and University of Connecticut respectively. His research interests are in biomedical sensors & Instrumentations, signal processing & control systems, and Optoelectronics & Laser Optics.

Jow, Julius

Julius Jow is ABD in Computer Science. He is the Director of the Cyber Security Laboratory and Certification Programs at Alabama A&M University. His research areas include cyber security, network security, and systems security.

Kaemmerlen, John

Professor Kaemmerlen is a Senior Lecturer in Industrial and Systems Engineering at RIT. He teaches several courses and has been a faculty guide for projects in the Multidisciplinary Senior Design program for almost eight years, guiding a total of 49 projects to date. Prior to coming to RIT he worked for 31 years at Kodak

Kim, Youlee

Youlee Kim is a graduate of the Laboratory Science Technology program at the National Technical Institute for the Deaf (NTID) and is currently enrolled in RIT's Chemistry program. She completed a co-op at Stony Brook, is a member of the National Society for Leadership and Success, and was recently inducted into Epsilon Pi Tau National Honor Society.

Kudithipudi, Dhireesha

Dr. Dhireesha Kudithipudi is an associate professor and graduate program chair at Rochester Institute of Technology. She is the director of the NanoComputing Research Lab at RIT (<https://www.rit.edu/kgcoe/nanolab/>). Dr. Kudithipudi received her Ph.D. in Electrical and Computer Engineering from University of Texas- San Antonio. Her research focuses on brain-inspired computing, energy efficient hardware for machine learning algorithms, bio-inspired computer architectures using emerging devices, and energy management. Her research efforts are supported by DoD, NSF, and industrial affiliates. She has published over 70 peer reviewed journal articles, conference papers, and book chapters. She is a multiple year recipient of the AirForce Research Labs Faculty Fellowship, is an associate editor for journal of circuits and systems and chaired several IEEE workshops/symposiums. Dr. Kudithipudi is also actively engaged in educational scholarship activities to retain minority students in Computer Engineering education and provide Computer Engineering exploration opportunities for K-12 students/teachers.

Kuhr, Sam

Sam Kuhr is a 5th year electrical engineering student at Rochester Institute of Technology. He is interested in analog signals, filtration, and power systems. Sam has had co-ops with O'Brien and Gere, and Riverhawk Company.

Kushalnagar, Raja

Raja Kushalnagar, J.D., LL.M., Ph.D., is an assistant professor in the Department of Information Computing Sciences at the National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY. His research focuses on accessible computing for deaf, hard of hearing, low vision and blind consumers' access to multimodal information, such as television.

LeClair, Jane

Dr. Jane LeClair is the Chief Operating Officer for the National Cybersecurity Institute (NCI) at Excelsior College, whose mission is to serve as an academic and research center dedicated to increasing the knowledge of the cyber security discipline. Dr. LeClair previously served as Dean of the School of Business and Technology at Excelsior College.

Before joining Excelsior College, Dr. LeClair worked in education and the commercial nuclear power industry. She taught at various universities and in 2015 published Volume II of *Protecting Our Future: Educating a Cybersecurity Workforce* and *Cybersecurity in Our Digital Lives*.

Dr. LeClair is an advocate for attracting and retaining more women in cybersecurity and welcomes contributions to the LeClair Scholarship for Women in Technology. As a thought leader she regularly speaks with the media and has testified before the House Committee on Small Business on Cybersecurity in Small Business. Dr. LeClair holds an MS in Cybersecurity.

Lee, Jason

Jason Lee is a fifth year Electrical and Mechanical Engineering Technology in the College of Applied Science & Technology at RIT. For over two years, he has worked as a hardware engineer under NTID's Center on Access Technology (CAT) department. During that period, he has developed the first generation Real-Time Tracking Display (RTTD). He is currently researching and analyzing data for developing the second generation RTTD for classroom use.

Longwell, John F.

John has a BS Metallurgical Engineering from RPI and an MBA from SUNYIT. He worked in the waterworks, automotive and machine tool industry for 30 years in a variety of manufacturing, quality assurance, engineering and research and development positions. In 2001 he began as an instructor at Corning Community College teaching courses in the engineering science and mechanical/manufacturing/machine tool technology programs at CCC. He has taught introductory CAD courses using AutoCAD and SolidWorks, and currently teaches SolidWorks in the engineering AS program.

Mahar, Justin

Justin Mahar is Software Engineer, C-Print Development, National Technical Institute for the Deaf. He has worked on development of several versions of the C-Print software for 10 years.

Malhotra, Yogesh

Dr. Yogesh Malhotra is Assistant Professor of Computer Science at SUNY Corning STEM Faculty. Earlier, he served as Associate Professor & Assistant Professor of Quantitative Methods IT & Operations Research at Syracuse University. Clients-Patrons of his tech ventures have included JP Morgan, Goldman Sachs, Google, IBM, Intel, Harvard, Microsoft and MIT.

Mallory, James

In his 33 years at Rochester Institute of Technology, James Mallory has served as a teacher, an author, a presenter, an innovator, a leader and a consultant on a variety of classes and projects, both internal and external to the institute. Professor Mallory has researched, developed, implemented and taught a number of different curricula in traditional, online and blended learning formats for three different colleges at RIT. He received the coveted RIT Eisenhart outstanding teaching award for his efforts. Professor Mallory has also developed and taught technical training courses and curricula for companies such as Xerox and Eastman Kodak.

Marchetti, Carol

Dr. Carol Marchetti is an associate professor of statistics at RIT, and has research interests in statistics education, deaf education, quality improvement, and gender equity in STEM. She is the PI of the NSF Thinking CAP project.

Mathisen, Jeff

Jeff was born in Oregon and raised in Washington State. He became self-employed doing computer repair service at age 17 and he attended a deaf school for two years. After he graduated, he continued in his own computer business on a part-time basis for a Christian school as a system administrator. He also worked contract jobs; one was as a hardware operation technician at one of Google's data centers in Dalles, Oregon. He is a third-year student major in Information Computer Studies at NTID/RIT, expecting to graduate in May, 2016.

McClive, Jacqueline

Jacqueline McClive is a lecturer in NTID's Department of Science & Mathematics, and holds degrees in applied and computational mathematics and ASL-English interpretation, and serves as Senior Personnel and interpreter on the NSF Thinking CAP project.

Merkel, Cory

Cory earned the BS and MS degrees in computer engineering from the Rochester Institute of Technology in 2011. He is currently pursuing a PhD in microsystems engineering with the NanoComputing Research Lab at RIT. His research interests include neuromemristive systems design, artificial neural networks, and unconventional computing paradigms. Upon graduation, Cory will join the Air Force Research Laboratory Information Directorate where he will work on intelligent computer architectures.

Meskin, Matin

Matin Meskin received the B.S. degree in electrical engineering in 1999 from Shahid Chamran University of Ahwaz, Iran, and the M.S. degree in 2014 from State University of New York at Buffalo, USA. He is now pursuing the Ph.D. degree at State University of New York at Buffalo, USA. His research interests are power system protection and smart grid.

Mousley, Keith

Keith Mousley is a math associate professor in NTID's Department of science and Math for 26 years. He has taught math from pre-algebra to advance math and conducted research in math areas such as problem solving and fractions, and is currently co-PI on the NSF Thinking CAP project.

Nadolinski, Kyle

Kyle Nadolinski is the GridEd Student Innovation Board undergraduate representative for SUNY Buffalo State College, chair-elect of the IEEE Buffalo State College chapter, and student in the Electrical Engineering Technology: Smart Grid program. He will be sharing insight into the use of power simulation programs ETAP 12.6 Student Edition and PowerWorld Simulator 18 on power system design projects as a method to verify power system design calculations. Active interests include renewable energy, protective devices and laboratory based learning methods in power systems education.

Oliva, Ricardo

Engineer for Edibon USA. A graduate of the ISE program at Florida International University. The abstract shall be referencing the EDIBON MPSS Smart Grid and also the Scada IDS protection system. The unit appears in the National Journal of Engineering. Designed and created for education in 2014, in collaboration with SEL of Pullman Washington. Smart Grid Scada system for EET, EE ISE and CSE training or energy research and development. Previous Lab engineer with 10 years' experience to include other didactic engineering global companies.

Pagano, Todd

Dr. Todd Pagano is a chemistry professor at RIT/NTID and was the founding Director of the Laboratory Science Technology program at NTID. He is a balanced teacher-scholar who takes great pride in involving underrepresented students in scientific research projects.

Pannullo, Nicole

Nicole Pannullo is a NTID-supported student in RIT's Chemistry program. She received the American Chemical Society Outstanding High School Student Award, graduated valedictorian of her high school class, was awarded the AP Scholar with Distinction, and has received several other notable awards and accolades. She is an all-state clarinetist and is involved in RIT bands.

Polepalli, Anvesh

Anvesh earned his bachelors in Electronics and Communication Engineering from Amrita Vishwa Vidyapeetham University in May 2014. He is currently pursuing a Master's Degree in Computer Engineering at Rochester Institute of Technology. His research interests are in Reservoir Computing Architecture with a focus on Liquid State Machines.

Ptucha, Raymond

Ray is an Assistant Professor in Computer Engineering at Rochester Institute of Technology specializing in machine learning, computer vision, robotics, and embedded control. Ray was a research scientist with Eastman Kodak Company for 20 years where he worked on computational imaging algorithms and was awarded 26 U.S. patents with another 23 applications on file. He graduated from SUNY/Buffalo with a B.S. in Computer Science (1988) and a B.S. in Electrical Engineering (1989). He earned a M.S. in Image Science from RIT in 2002. He earned a Ph.D. in Computer Science from RIT in 2013. Ray was awarded an NSF Graduate Research Fellowship in 2010 and his Ph.D. research earned the 2014 Best RIT Doctoral Dissertation Award. Ray is a passionate supporter of STEM education and is an active member of his local IEEE chapter and FIRST robotics organizations.

Rackal, Rachel

Currently pursuing her Baccalaureate degree of Computer Engineering Technology at CUNY – NYCC of Technology. She is interested in Electrical Design and the application of Information & Networking security which focuses on penetration testing. She currently designs Fire Alarm Systems at an Engineering firm for commercial/industrial buildings. After completing her final semester at NYCCT, her next step is to pursue a Master's degree in Electrical Engineering. She also plans to continue her research of Ethical Hacking with Kali Linux.

Robinson, Vicki

Vicki Robinson is an Associate Professor at the National Technical Institute for the Deaf at RIT. She has been teaching physics to deaf college students since 1978, and has a long-standing interest in different forms of instructional delivery technologies.

Robledo, Christopher

Student in the Computer Engineering Technology department at CUNY – NYCC Technology. He is interested in the analysis of circuits and their implementation, as well as penetration testing/network security. He has an Associate's degree in Applied Science in Electromechanical Engineering, and is nearing completion on his Bachelors of Technology in Computer Engineering Technology.

Ross, Annemarie D.

Annemarie Ross, Associate Professor at the National Technical Institute for the Deaf, received her B.S./M.S. degrees in science at the Rochester Institute of Technology and is currently pursuing her PhD at the University of Buffalo. She has published scholarly work in both the fields of environmental chemistry and deaf education.

Safiuddin, Muhammed

Mohammed Safiuddin received B.E. (Electrical) degree from Osmania University, Hyderabad, India in 1959 and MSEE degree from the University of Illinois in 1960. Later he received MBA and Ph.D. degrees from the University at Buffalo [SUNY], in 1971 and 1982 respectively. His interests in continuing education has kept him in close contact with the University at Buffalo (SUNY), where he did part-time teaching in early sixties and then served as Adjunct Associate Professor ('77-'91), and Research Professor ['91-'10]. He is currently Research Professor Emeritus [Advanced Technology Applications] in the Electrical Engineering Department of University at Buffalo [UB].

Samanta, Sam

While growing up, Sam Samanta was influenced by Jesuits in India. Graduate of competitive college environment of Indian Institute of Technology, he did not find Carnegie-Mellon University particularly intense for his MS in Physics. During the decade of research in Surface Science for doctoral and post-doctoral work, Sam developed instruments which are now used in nanotechnology field. In 1998, Dr. Samanta earned SUNY Chancellor's Award for Excellence in Teaching. In collaboration with high-tech industries Sam developed and now directs, Instrumentation and Control Technologies program at Finger Lakes Community College to address critical shortage of high-tech workers with adaptable skills.

Sankoh, Amie

Amie Sankoh is a graduate of the Laboratory Science Technology program at the National Technical Institute for the Deaf (NTID) and is currently enrolled in RIT's Biochemistry program. She completed two co-ops with Dow Chemical and another with the University of Rochester. She has received awards from the Rochester Section of the American Chemical Society and NTID.

Silverstein, Barry

Barry Silverstein is a graduate of Institute of Optics at the University of Rochester and was employed by Eastman Kodak Company for 28 years. During this tenure at Kodak Barry developed and commercialized optical-mechanical-electrical systems for technologies as diverse as Compact Disk recording, commercial space based telescopes, film projection illumination systems, laser printing of printing plates, laser printing of graphic arts proofers and digital projection technologies. Barry was the primary inventor, system developer, and manager for Kodak's Laser Projection Technology which was the world's first Digital Cinema quality laser projector demonstrated to the Hollywood community. Barry is credited with 59 US patents and 9 industry publications. Barry is now the Senior Director of Hardware at IMAX leading the development of IMAX's laser projection head.

Stanislow, Joseph

Joe Stanislow is an Assistant Professor of the Information and Computing Studies. Before joining the NTID faculty he worked for AT&T Bell Laboratories as an electrical engineer, physical designer, and computer programmer for 20 years. He received his BS from RIT and MS in CS from Stevens Institute of Technology.

Stinson, Michael

Michael Stinson, who is deaf, is Professor, Masters of Science in Secondary Education, National Technical Institute for the Deaf, Rochester Institute of Technology. He is co-inventor of the C-Print real-time captioning system and has directed 13 major grants to develop and evaluate this widely used technology. He has 85 publications.

Tarloff, Benjamin

Ben Tarloff is a 5th year student in RIT's Mechanical Engineering program. His areas of interest are next generation chassis technologies and vehicle autonomy as well as the automotive and aerospace industries in general. He has worked at Tesla Motors in their Chassis Systems department, Maval Manufacturing as one of their sole design and test engineers, and Honda of America in their Powertrain Development department. He has also performed research on Electromagnetic Pulse Forming under Dr. Christian Weddeling at TU Dortmund in Germany.

Tiss, Kenneth J.

Mr. Kenneth J. Tiss, AIC, CPC is an instructor in the Department of Forest Natural Resources and Management, Construction Management at SUNY College of Environmental Science and Forestry. His research areas are in undergraduate and graduate education, curriculum, construction project management, construction safety, planning and scheduling, and equipment and methods.

Trager, Brian

Brian Trager is an Assistant Professor of the Information and Computing Studies department, specializing in programming, web development and mobile app development. Brian has led the implementation, development and oversight of several projects related to education and accessibility under the Center on Access Technology (CAT) at NTID.

Vo, Dalena

Dalena is from Hayward, California. She went to California School for the Deaf in Fremont. She went to community college to further develop her English and Math skills and then transferred to RIT. Dalena is a third year NTID student in the Information and Computer Studies Department at RIT and will graduate in May 2016 with her AOS degree. Dalena is the fundraising assistant for the NTID Asian Deaf Club and enjoys playing intramural basketball at RIT.

Werner, Gordon

Gordon Werner is a second year Ph.D. student in the B. Thomas Golisano College of Computing & Information Sciences. His research focuses on the development and implementation of authenticated encryption algorithms in hardware as well as their applications in secure computing systems.

Wolff, Josephine

Josephine Wolff is an assistant professor of public policy and a member of the extended faculty of the computing security department at Rochester Institute of Technology. Her research focuses on cybersecurity policy and economics. She received her PhD from MIT in Engineering Systems, and her AB in mathematics from Princeton University.

Wong, Allison

Allison Wong, student researcher, is a 5th year student in RIT Department of Information Sciences & Technologies at B. Thomas Golisano College of Computing & Information Sciences. She is interested in researching a variety of areas in Statistics to help deaf/hard-of-hearing students.

Xiao, Yang

Yang Xiao has PhD in Computer Science. He is a computer science professor at the University of Alabama, Tuscaloosa. His current research interests include networking and computer/network security. He currently serves as Editor-in-Chief for International Journal of Security and Networks, International Journal of Sensor Networks, and Journal of Communications.

Yerrick, Randy

Dr. Yerrick is a Co-PI and collaborator on numerous science and engineering projects funded by the National Science Foundation as well as being an instructor teaching courses in engineering education with the UB/RIT Engineering Education PhD Cohort. Dr. Yerrick is an Apple Distinguished Educator, Served on the Board of NARST, and currently acts in their role of Director of Electronic communications. He is also the recipient of the JRST Outstanding Research Award, STANYS Award for Excellence in College Science Teaching, and UB Award for Innovation in Teaching Award.

Yue, Lu

Lu Yue is a PhD student from the UB Electrical Engineering department. Lu has a Master's Degree from UB, and is currently representing the UB/Buffalo State Power Center for Utility Exploration. Lu's area of expertise is power system engineering, with years of research and study experience.

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Campus Map

