SECEDHA 2024

Athens, GA – October 24 - 25

# Southeast Electrical and Computer Engineering Department Head Association

**10/25/25 – Meeting Notes**

## ECEDHA Association Updates

2024-2025 Academic Year

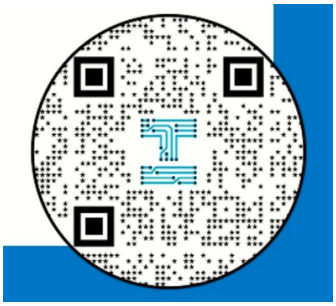
- Goal: increase membership by 10%
- New Initiatives:
  - New department Chair Outreach
  - Re-engaging previous ECEDHA institutions
  - Working Group for Category 4 Institutions
    - How can we support these smaller institutions and their participation
- Updated ECEDHA Membership Brochure

2025 ECEDHA Annual Conference & ECE Expo in Norfolk, Virginia – March 20th – March 24, 2025

- Update to program pattern / schedule
- Program committee
- Registration
- Broadening attendance
- Industry participation
- ECEDHA Awards – nomination announcement will go outside soon
  - Diversity Award
  - Outstanding Leadership Award

iREDIFINE Program – NSF Broadening Participation in Engineering Grant

- 5-years, $800,000
- Three Modules
  - Online exploration of careers in academia
  - The iREDEFINE Workshop at the ECEDHA Annual Conference
  - I2mHubs mentoring network
- Three ways you can help
  - Advertise iREDFINE to qualified students
  - Interact with the iREDIFINE Fellows at ECEDHA
  - Volunteer to be involved



- STAY Connected on LinkedIn

**Incorporating AI into ECE Curriculum -** Facilitators Asis Nasipuri and John R Morelock

State of Generative AI

- AI is here to stay
- Key is to learn the benefits and concerns
- Need structured policy and training for best usage

Initiatives at UNC Charlotte, from the Center for Teaching and Learning – using AI across the curriculum

Impacts of AI in Engineering Education

- Enhanced learning experiences
    - Apply theoretical knowledge to real-world scenarios, improving understanding and problem-solving skills
    - Providing personalized learning paths and adaptive tutoring
    - Facilitating self-directed learning and helping students acquire and practice skills
- Improved Teaching and Assessment
    - Streamlining tasks like grading and lesson planning
    - Providing data analytics to track student performance and identify at-risk students
- New Skills and Knowledge Areas
    - Aiding AI and machine learning as new subjects for engineering students to learn
- Guidance for Generative AI in Education and Research
    - Institutional strategies to facilitate responsible and creative use of GenAI
        - Institutional implementations of ethical principles
        - Guidance and training
        - Building GenAI prompt-engineering capacities
        - Detecting GenAI-based plagiarism in written assignments
- AI Detectors – Errors with big consequences
- AI in ECE Curriculum: outline of Discussion
    - Plan:
        - Impacts of AI in Engineering Education:
            - Framework for thinking about using AI for teaching
            - Examples of usage
            - Roundtable discussion
        - AI in ECE Curriculum
            - Courses, concentrations, broader use
            - Focus on Machine Learning

        - Roundtable discussion
- Reframing how we think about Gen AI as educational technology
    - What kinds of "Productive Thinking" matter?
    - Focusing on the positive impacts
- Generative AI and K-12 Education
- Generative AI is an arrival technology
    - Adoption technology: things professors adopt for students to use in our courses
        - Examples: MatLab, Top Hat, eLearning Commons
    - Arrival technology: a technology arrives in our class from our students
        - Smart phones
        - Chegg
        - AI
    - Students use arrival technology whether we want them or not
    - We can help them use it smartly rather than treating them as contraband
- What does Generative AI allow our students to do?
    - It allows students to cheat > short term consequence is to ban the technology
    - MIT Report:  Students use it to bypass "productive thinking"
        - Focus their thinking on the parts that we want them to learn
        - Think about what kind of thinking is okay for them to bypass, and focus on the depth of their learning
    - How educators are starting to use Gen AI in UGA Engineering
        - John Morelock: teaches a graduate course on being an effective engineering educator.
            - Students are allowed to use LLMs to help them with assignments, if they specify how the LLM is used. AI must not allow them to bypass the learning goal of assignment (specified in the syllabus).
            - Professor uses LLMs to identify quotes from written assignments that correspond to rubric criteria. Speeds up grading and allows for more targeted feedback.
        - John Brocato teaches The Bioengineering Professional Personal, engineering communication course
            - Students submit LLM-written assignments alongside tehri own, and submit reflections on the strengths and weaknesses of LLM writing
            - Discusses the role of prompt design in the quality of LLM output
        - 3 faculty were funded to develop a custom AI chatbot using GenAgent LLM framework, enabling discipline specific Socratic dialog for personalized student learning.
    - Innovative Approaches to integrating Generative AI in ECE Education: Enhancing Teaching and Learning (Arun Ravindram)
        - How does Gen AI help Education

        - Demo- Convolution – model used ChatCPT
            - Prompt: explain to me what convolution operation is?
                - AI tool asks, what level for testing?
            - Interactive for aid to teaching
            - Have students reflect on what they are learning with using the AI tool
    - Roundtable Discussion #1
        - Do you have faculty in your department who are actively using GenAI for teaching?
        - How are they using it? Self-directed learning? Grading? Training how to use GenAI?
            - Mixed feelings from faculty
            - Be cautious, it may hallucinate and give false information
                - Can we ask the students, tell us if this is a correct response?
            - Model logic and controls applications, a programming class – example: uses MatLab and MatLab toolbots, the code has to be Python, and model logic code. Generate code using ChatGPT to modify the application
            - Students can use the tool for asking more questions about concepts they are learning in a course
            - When John Morelock is using the tool for helping with grading, he doesn't trust it to always be accurate, so he has the scoring come out in the form of a table following rubric criteria he has provided, and he can go back and check the scoring on the table based on the output. He also maintains FERPA standards by removing the student's name and any other identifying criteria before inputting the data to ChatGPT.
            - Image based information can also now be inputted into GenAI and output an answer
            - Challenge the faculty to not only talk with the students about when they can use GenAI, but to give John Morelock's presentation (or similar) at the beginning of a course to start the conversation about "what is AI doing for me?" How does GenAI simplify non-productive thinking and using framework to best use GenAI as a tool for deepening intellectual engagement with the learning.
            - Allowing students to take the responsibility of learning
            - We will add John Morelock's slides to the SECEDHA website
            - Students benefit from learning in a classroom, then after classroom, they can use ChatGPT for finding more examples and to dive in for more information
    - Incorporation of AI and ML Topics in ECE Curriculum

        - Wide range of efforts in ECE Departments
            - Most common: New Courses on AI/ML introduced at junior senior and graduate levels
- AI in ECE Education: Scott Action, Virginia Tech
    - AI in the Curriculum
        - New curriculum status
            - Intro to ML (ECE 2410) – before signals, before math (except calc)
            - Most ML courses focus on coding, but this is an entry course
            - 2 goals
                - CS is killing us in #s - so let's do something that is attractive to students!
                - We had students deficient in programming – offering ML as a first level programming course
            - 3-hour course
                - Simple ML classification, clustering, and regression algorithms
                - Use ML terminology such as training vs testing
                - Covers basic methods
                - Few topics covered at higher level: neural networks
        - Focus pathways
            - CHIPS
            - E2P
            - Robotics and Embedded systems
            - AI & Machine Learning
        - Some research
            - Taking AI into the elementary classroom – object correlations, agnostic tool for observations
            - Within one year, they developed a pilot course, and then after 1yr 3 months, they have an approved course – with 2 teaching faculty dedicated to getting the approvals for the course
    - Roundtable Discussion #2
        - Have you added courses or made changes in your curriculum to add topics on AI?
            - ML Content suggestions
        - What should be taught in ECE for successfully incorporating AI into the curriculum?
        - Is anyone integrating this into Gen Ed courses?
            - Introduction to AI, in partnership with English faculty – reading iRobot
            - Humanities and social contexts with AI

- Vanderbilt is doing this university wide – College of Computing
- Tennessee – applied AI (Gen Ed), introductory to AI as a tool (Engineering and Computers)

**Engaging with 2-year schools, HBCUs and other smaller programs**

How are you engaging?

- Offer summer internships for potential transfer students or recruits
    - Some are funded by the College of Engineering or the University
    - Summer research to bring in HS students
    - Pair with 2-year tech colleges near, post announcements for students to apply
    - Transfers in and transfers out
    - Funding from Intel to provide a pipeline
    - Offer a semiconductor bootcamp
    - Proposals to bring in students to see the facilities and provide materials for students that are shared across institutions
    - Provide professional opportunities for HBCUs – and then follow-through with engagement and relationships
    - Improving minority presence in STEM, and strong advisement for student retention
    - Providing industry engagement and cross-linkages with smaller programs
    - Partnerships with facilities, especially for graduate student research needs – providing space commitments
    - Military students with a 2+2 program in the evening. Start with an associate's degree from the tech school, then offer evening courses geared toward cohorts of students that have been from the industry field, practitioner field, and have a job during the daytime and are working toward finishing a degree. Provides a pathway for first gen, and students that have a job during the day. Labs are trickier for the evening, because they run much later.
    - Also using a transfer agreement to avoid complication with additional ABET requirements
    - Students start out the first two years from a technical college, transfer with an associate and then move
    - Provide enhanced courses for transfer students to bring them up to the same level for pre-established students
    - Example: E-mobility
        - multifaceted > certificate and other institutional partners would like to have exposure to the content
        - looking at ways to provide an asynchronous online resource to partner and help deliver content
        - State workforce initiative > need engineers, but also other development. Majority will be working in a highly technical manufacturing industry and

can provide educational pathways – and providing this with an intro engineering or a certificate-based program

- Looking at our ABET outcomes, how can our circuits course be more effective for students? Moving basic theory into the intro courses (Ohm's Law), and allows deeper dive into content in the circuits course --- however, this provides a problem for transfer students who don't receive the same basic theory in their intro course
  - Amanda question: for ABET needs, would student exit surveys help with meeting evaluation criteria for cohort students from other institutions?
- Having members from partnering institutions serve on each other's (*student?)* committees

**Best Practices for Engaging with your Industrial Advisory Board**

Goals:

- Information exchange
- Learning about effective practices

Discussion: Composition of the (I)AB

- Common practices
  - 10-20 members from the industry
  - Invite members who have interested in our students (employs graduates)
  - Have interest in our programs
  - Successful alumni
  - Variety of experience levels
- Variations
  - Some units have strategic advisor boards
    - May include members from academia
- Term and Operations
  - Usually 2-3 years. More? Renewable?
  - How appointed? Invited by the Chair?
    - The Board selects and nominates. The Board votes. Others prefer to have the department select the board.
    - Development/enhancement does have a say on nominating/suggesting the Board.
    - Other institutions prefer not to select a board that is made of donors.
    - Send an invitation letter with an outline of the expectations
  - Operations
    - 1-2 times/year? In-person? Remote?
    - How is the agenda decided?
    - Attendance?
      - Remote options for those spread across a distance

Discussion points:

- Who are your best IAB members
- What do they like about serving on the IAB?
- How do we get them to attend?
- Do you charge an annual membership fee? Can donate to a scholarship fund > they want to give back.
- Q: Do you pay for their travel? A: Not common practice
- Some board members may serve in the capacity as adjunct faculty (university email account, and can share information among other faculty)
- Some of created document sharing with advisory board without needing to create adjunct faculty (limited access rights)

Discussion: Roles and Responsibilities

- Common expectations: Curriculum alignment, provide perspectives from the industry on what is relevant today
- Program Educational Objectives, establish, review, evaluate
- Build industry connections for faculty for their research: assist with developing industry collaborations, advice on special skills, equipment, software, standards
- Build student connections: connections for employment, internships
- Variations:
    - Fundraising
    - Publicity
    - Help with pushing communication from industry to higher administration for greater support
    - Other? Guest speakers

Discussion:

- Do you have any documented charter for your IAB?
- Do you have any other important roles for your IAB?
- Any success with fundraising?

ECE@UNC Charlotte: Sample benefits from IAB interactions

- ABET accreditation support
    - PEO evaluations
    - Attend lunch with PEV, faculty, and students
- Provided support letters for new program proposals
    - Common first year + revisions for flexibility
    - New MS in Computer Engineering

    - Concentrations
- Employer perspectives on skills needed from graduates
    - Teamwork, entrepreneurship, adaptability, leadership, new areas (semi-conductor, AI, battery)
- ECE Advisory Board Sponsored Scholarship
- Where we did not get help:
    - Interest in our MS/PhD students
    - Graduate recruitment (local)

**SECEDHA survey:**

Send out as a Qualtrics, will send out comment questions

Who should get the survey? We decided to send it to everyone.

**Election of a Secretary:** with limited attendance at the end of this meeting, do we want to wait and send an email to poll ECEDHA to serve as secretary? Anyone in this room want to serve? Ben is interested. Mark and Mark suggest we vote if we have a nomination in the room.

All in favor to vote for Ben Klein to serve as the next Secretary? All vote in favor. Discussion: we could do the kick-off annual meeting with opening, mid-morning break, survey, and then business election.

**Anyone had an ABET visit this year? Comments about this?**

- One faculty put in a ton of effort to prepare for the visit
- Senior design – program design standards
- The meeting was supposed to happen in November, they had a representative visit in October
- Initial accreditations visit for computer engineering a year ago – comment to disaggregate the evaluation of our CSE with EE students
- The way we are assessing some of our outcomes, attaining this level or higher – don't use the scores on the problems, use a 1-5 metric scale. A rubric scale. Totally separate from grades.
- Feedback that DEI needs to be implemented into the program evaluation (see bullet link on ABET's statement on Implementing DEI Concepts into Program Criteria)
- Change the scoring to "change in proficiency" "demonstrates proficiency"
- ABET's tone has changed from "we're here to rate you" to "we're here to support you"
- Safety in the lab
- Continuous improvement across the board
- Where there are deficiencies – they will ask the same questions again the next year

**Wrap-up**

- The entire graduate student population at Vanderbilt are voting to unionize, causing a problem with moving forward with the graduate school
    - Difficulty with tuition waivers and stipends
    - Legally they are not employees
    - If they vote the union in – UAW will come in and oversee
    - Duke and NC State have had their graduate students unionize
- Any difficulty with the hour requirements of graduate student research hours in the lab? Is this a common issue?
    - At UGA, the Graduate School is initiating a mentorship training program geared toward faculty on best practices for mentoring graduate students
    - It is true that some faculty members treat students like "cheap labor." We must protect the value of a graduate students. < possible topic for March meeting.
    - What are we saying as faculty about our career, and demonstrating this to our students?
- Acknowledging our colleagues that are stepping down: Luke Lester


INNOVATION
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