

20TH ANNIVERSARY

# SEI Software Engineering Workshop For Educators 2023

Hybrid

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# Poll: Where are you joining us from?



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Day 1

# Welcome and Introduction

# Workshop Objectives

Share and refine ways to include software engineering concepts, methods, and practices in college and university courses

Form working relationships among participants and nurture a software engineering educator community

Collect brief “impact” stories that enable us to show value of continuation of the workshops

# Workshop Expectations

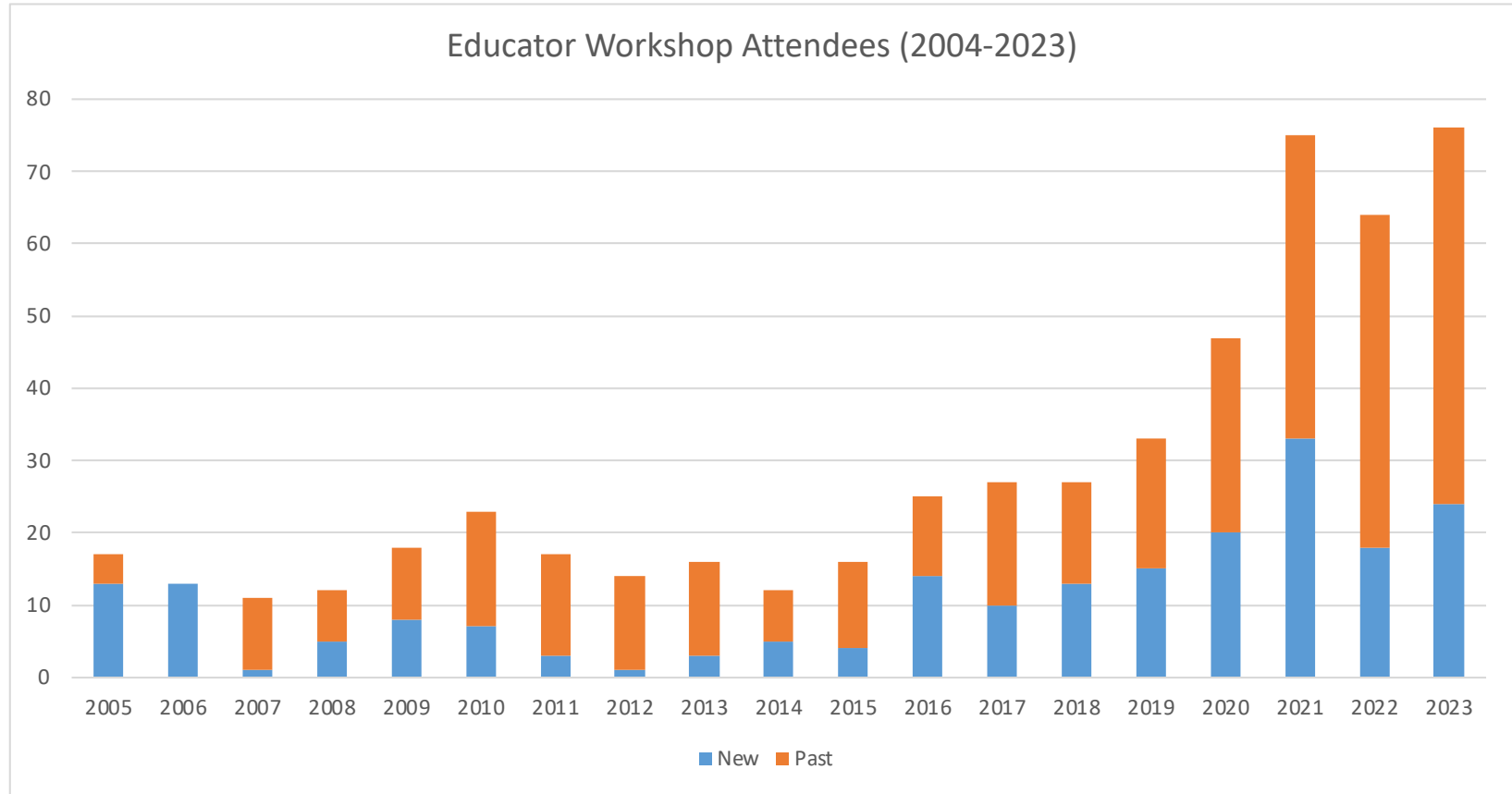
The workshop is a two-way conversation

- Ask questions
- Participate in polls and open questions

There are more attendees than usual at the workshop

- Keep your comments brief and to the point
- Give everyone a chance to participate

# Workshop History



# Open Question

## What sparked your involvement in the workshop?

Type your response now.

Please include your name in your response.

We will give you a couple of minutes.

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# Open Question

## Why do you keep coming back?

Type your response now.

Please include your name and the number of years you have attended the workshop in your response.

We will give you a couple of minutes.

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# Workshop Evolution <sub>1</sub>

From how to teach software architecture ...

- 2004: Fitting essential concepts into a “small package”
- 2005: How to think architecturally — quality attributes and working in teams
- 2006: Exercises and tool support for exercises

... to teaching others ...

- 2007: Forming and expanding the software architecture educator’s community
- 2008: Switch from “How can we do this?” to “Here’s how we do this in my programs”
- 2009: Half-day tutorial presented at CSEET on March 11, 2010
- 2010: Workshop at CSEET on May 22, 2011; group decision to ask for a shared artifact as the “entry fee” for the workshop.
- 2011: Workshop accepted for SIGCSE; low enrollment forced cancellation

# Workshop Evolution 2

... to learning from others ...

- 2013: Unique opportunity to interact with like-minded teaching colleagues face to face as well as to connect to a growing community
- 2014: How to apply what I just learned
- 2015: How to include emerging topics in courses

... to moving beyond software architecture to software engineering practices

- 2016: Expanding the software engineering educator's community
- 2017: A new perspective on cost estimation and microservices
- 2018: Project management, DevOps in practice, managing technical debt
- 2019: AI, machine learning, ethical reasoning, software quality
- 2020: SE4ML, quantum computing, SE education
- 2021: AI Engineering, AI4SE, SE4AI, blockchain, remote learning
- 2022: SE4AI, edge computing, software design

# Open Question

**What gems were inspired by the workshop (e.g., topic of instruction, shared artifact, connection with colleague)?**

Type your response now.

Please include your name and the year of inspiration in your response.

We will give you a couple of minutes.

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# Agenda: Day 1

Time	Activity
13:00 – 13:30	Welcome, Workshop Goals, Agenda – Workshop Hosts Introductions – All
13:30 – 14:30	20 <sup>th</sup> Anniversary Session: Changes over the Years to Architecture, External Context the Impacts the Academic Landscape, and Technology Len Bass, Carnegie Mellon University; Lawrence Jones, ABET; Linda Northrop, Software Engineering Institute
14:30 – 15:00	Break
15:00 – 16:30	Instruction: Supporting Neurodivergent Students in College and Onwards Dr. Andrew Begel, PhD of the Software and Societal Systems Department at Carnegie Mellon University

All times are EDT

# Agenda: Day 2

Time	Activity
13:00 – 14:30	<p>Instruction: Welcome to the Glorious Nation of Ambrosia! Cyber Forensics and Incident Response</p> <p>Rotem Guttman – Senior Cybersecurity Researcher and Cyber Forensics and Incident Response (CyFIR) Capstone Instructor, Software Engineering Institute</p> <p>William R. Nichols, AI – Infrastructure Engineer, Software Engineering Institute</p>
14:30 – 15:00	Break
15:00 – 16:30	<p>Instruction: Experiential Learning or, How I Learned to Stop Worrying and Love the Classroom</p> <p>Rotem Guttman – Senior Cybersecurity Researcher and Cyber Forensics and Incident Response (CyFIR) Capstone Instructor, Software Engineering Institute</p> <p>William R. Nichols, AI – Infrastructure Engineer, Software Engineering Institute</p>

All times are EDT

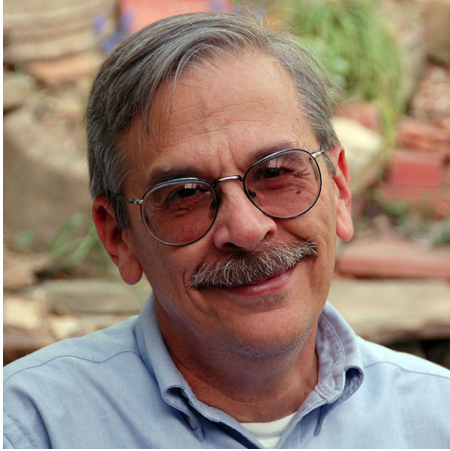
# Agenda: Day 3

Time	Activity
13:00 – 13:15	Review agenda for day 3
13:15 – 14:30	Educator-Led Sessions Breakout Group Discussion
14:30 – 14:50	Break
14:50 – 15:15	Summary of Breakout Group Discussions Breakout Group Leads
15:15 – 15:30	Closing Wrap-Up – Workshop Hosts Graduation – All Request for Feedback and Impact Statements – Educators

All times are EDT

Day 1

# 20th Anniversary Session: Changes over the Years to Architecture, External Context Impacting the Academic Landscape, and Technology



## Changes over the Years to Architecture, External Context Impacting the Academic Landscape, and Technology

Len Bass, Carnegie Mellon University; Lawrence Jones, ABET; Linda Northrop, Software Engineering Institute

2023 is the 20th year of the SEI Software Engineering Workshop for Educators. The event will feature a retrospective on the workshop by its founders: SEI Fellow Linda Northrop, CMU adjunct faculty and former SEI researcher Len Bass, and ABET Fellow and former SEI researcher Larry Jones. The workshop's initial focus on software architecture has evolved, as has the content of software architecture, the academic landscape, and new technology. All these factors could impact teaching content and approaches. During this session the founders will reflect on the changes over 20 years and engage educators in a discussion on what has, and should, stay the same and how the workshop should evolve to address future needs.

## What topic would you like to discuss during a breakout session?

Your response will determine the breakout session topics for Day 3.

- Elicit topics. Type your response now. If someone else has entered your topic there is no need to repeat it.
- Consolidate topics. We will review as a group and merge related topics.
- Vote. We will select the top five or so for the breakout sessions.

Changes over the years	Instruction topics	Topics from last year
Architecture	Neurodiversity	Hybrid/mixed mode teaching
Academic landscape	Cybersecurity	Assessment
Technology	Experiential learning	Student engagement

We are currently on our break

**Please return promptly at 3:00pm EDT**



Day 1

# Supporting Neurodivergent Students in College and Onwards

# Open Question

## What is your understanding of neurodiversity?

Type your response now. We will give you a couple of minutes.

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## Supporting Neurodivergent Students in College and Onwards

Dr. Andrew Begel, PhD

Associate Professor, Software and Societal Systems Department, Carnegie Mellon University

This talk will present the challenges that neurodivergent students face in their college coursework and career preparation. Like many students transitioning to college, neurodivergent students lose many of their prior scaffolds and supports. Unlike neurotypical students, they often have difficulty self-advocating to acquire the help that they need to succeed. They have lower completion rates for courses and degrees and are more likely to take time off in the middle of their degree program. Supporting these students in our classrooms and degree programs requires training faculty on the challenges they experience and developing curriculum and supports that afford better access.

In addition to in-classroom support, support is needed to prepare students to enter the workforce and help them stay employed. While supporting students and faculty is important, one of our other goals is to help destigmatize neurodivergent people, help neurotypical people better understand and communicate with their neurodivergent colleagues, and encourage everyone to better integrate neurodivergent students into their organizations and activities.

# Open Question

## **How do you support students who identify as neurodivergent in your classroom?**

Type your response now. We will give you a couple of minutes.

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Day 2

**Carnegie  
Mellon  
University**  
Software  
Engineering  
Institute

# Agenda: Day 2

Time	Activity
13:00 – 14:30	Instruction: Welcome to the Glorious Nation of Ambrosia! Cyber Forensics and Incident Response Rotem Guttman – Senior Cybersecurity Researcher and Cyber Forensics and Incident Response (CyFIR) Capstone Instructor, Software Engineering Institute William R. Nichols, AI – Infrastructure Engineer, Software Engineering Institute
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All times are EDT

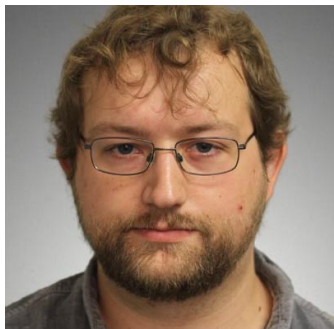
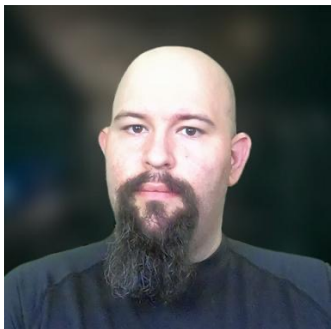
Day 2

# Welcome to the Glorious Nation of Ambrosia! Cyber Forensics and Incident Response

# Poll: What is your level of expertise regarding cyber forensics?

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## Welcome to the Glorious Nation of Ambrosia! Cyber Forensics and Incident Response

Rotem Guttman, Senior Cybersecurity Researcher and Cyber Forensics and Incident Response (CyFIR) Capstone Instructor

William R. Nichols, AI-Infrastructure Engineer

Software Engineering Institute

Creating learning experiences that immerse the student in a living world can turn dry technical material into a dynamic and memorable learning experience while giving us the opportunity to conduct evaluations in an integrated manner. During this session Rotem Guttman and Will Nichols will give a tour of their award-winning Cyber Forensics and Incident Response Capstone Class – an engaging experience that places students on the fictional island of Ambrosia and tasks them with conducting a full forensic investigation of a critical national incident.

We are currently on our break

**Please return promptly at 3:00pm EDT**



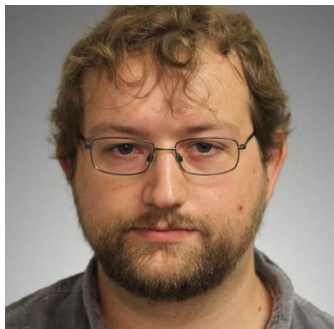
Day 2

# Experiential Learning or, How I Learned to Stop Worrying and Love the Classroom

# Poll: How much experience do you have with immersive teaching experiences?

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## Experiential Learning or, How I Learned to Stop Worrying and Love the Classroom

Rotem Guttman, Senior Cybersecurity Researcher and Cyber Forensics and Incident Response (CyFIR) Capstone Instructor

William R. Nichols, AI-Infrastructure Engineer

Software Engineering Institute

Converting a class into a learning experience can be daunting. To many the thought of abandoning lectures, dismissing tests and quizzes, and giving students ultimate freedom of exploration can be daunting. In this workshop Rotem Guttman and Will Nichols will walk participants through the process of creating their own experiential learning content – starting from learning objectives and progressing through to a complete course plan.

Day 3

**Carnegie  
Mellon  
University**  
Software  
Engineering  
Institute

# Agenda: Day 3

Time	Activity
13:00 – 13:15	Review agenda for day 3
13:15 – 14:30	Educator-Led Session Breakout Group Discussion
14:30 – 14:50	Break
14:50 – 15:15	Summary of Breakout Group Discussion Breakout Group Leads
15:10 – 15:30	Closing Wrap-Up – Workshop Hosts Graduation – All Request for Feedback and Impact Statements – Educators

All times are EDT

# Open Question

## **How did traditional software engineering classes change over the past two decades?**

Type your response now. We will give you a couple of minutes.

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Day 3

# Educator-Led Session

**Carnegie  
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Institute

# Educator-Led Discussion Session (In-Person + Virtual)

Educator-led session on selected topics related to teaching software engineering, and general concerns of student engagement, student evaluation, and the hybrid classroom.

- Select a session, sessions run from 13:15-14:30
- Choose a person to facilitate discussion (if not already selected)
- Choose a person to take notes and prepare a slide containing a summary of the discussion
- Discuss: topics are meant to aid you in joining a group with shared interests though the group may take discussion in any direction that meets their needs
- Break at 14:30, though you may continue discussion as desired
- Return promptly at 14:50 prepared to present a summary of discussion

# Breakout Sessions

## On-Location

<Session 1>

- Facilitator:
- Topics:

<Session 2>

- Facilitator:
- Topics:

## Remote

<Session 3>

- Facilitator:
- Topics:

<Session 4>

- Facilitator:
- Topics:

<Session 5>

- Facilitator:
- Topics:

If you are on location, we will ask for a show of hands to indicate interest in a given session.

If you are remote, type the number of the session you will attend into the Zoom chat window.

Please return promptly at 2:50pm EDT prepared to present a summary of your discussion.

We are currently on our break

**Please return promptly at 2:50pm EDT**



# Breakout Discussion Summary

## On-Location

- 
- 

## Remote

- 
- 
-

Day 3

# Closing

**Carnegie  
Mellon  
University**  
Software  
Engineering  
Institute

# Open Question

**In one word, how would you describe the workshop?**

Type your response now.

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# Reflection

**How does the workshop evolve to meet your needs?**

Type your response now.

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# Graduation

## “Group Photo”

- Please turn on your video if you wish to be included in the photo.
- We will take a screen snapshot of the galleries to post on the webpage.

# Certificates and CEUs

Those of you that attended all three days will receive an online attendance certificate and CEUs (continuing education units)

It will be e-mailed to you in 3-4 weeks

# Feedback and Impact Statements

Please provide feedback.

Your “impact” stories will enable us to show value of continuation of the workshops and your comments will help us improve future events.

# Some “Impact” Bullets from Previous Years

## Reasons to attend:

- *“This is a great conduit for collaboration among SE Educators and technologists. There were people who are regulars who offer mentors to new folks and new folks bringing new ideas to the conversation.”*
- *“An excellent opportunity in professional development for academics teaching software engineering, the workshop can fill in many holes in a rapidly evolving field.”*
- *“Every time I participate, I use what I learn directly in my curriculum.”*

## Take-aways

- *Topics in technology: “... we do a DevOps course, and the material presented there will let us see areas where we need to update that. The whole idea of Technical Debt as a way to explore maintainability and extensibility is very rich.”*
- *Teaching: “As a result of this workshop, I will be making some substantive changes to the software engineering courses that I teach -- not just architecture but others ranging from management to testing. The community of minds represented at the workshop provide a diverse and fascinating set of perspectives on how to teach software engineering. It was both a humbling and informative week.”*
- *Networking: “Meeting new people and establishing new work relationships,” “Collaboration,” “Shared artifacts, talks.”*

# What Should We Do Next Time?

SEI Courses: <https://www.sei.cmu.edu/education-outreach/courses/>

Annual Events: <https://www.sei.cmu.edu/news-events/events/>

Emerging technologies of interest?

Emerging software engineering concepts, methods and practices?

What would you like to hear about?

# Contact Information

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