

2024 ASEE Annual Conference

Distinguished Lecture

Education Research & Methods Division
Design in Engineering Education Division



American Society for Engineering Education | Design in Engineering Education Division

Design Signatures: A Journey from Design Expertise to Design Awareness

Dr. Cynthia J. Atman

University of Washington

Monday, June 24, 2024

11:00am – 12:30pm

Oregon Ballroom 203

Oregon Convention Center

About Dr. Cynthia J. Atman

Dr. Cynthia J. Atman is the founding director of the Center for Engineering Learning & Teaching (CELT), a professor in Human Centered Design & Engineering, and the inaugural holder of the Mitchell T. & Lella Blanche Bowie Endowed Chair at the University of Washington. Dr. Atman is co-director of the Consortium to Promote Reflection in Engineering Education (CPREE), funded by the Leona M. and Harry B. Helmsley Charitable Trust. She was director of the NSF-funded Center for the Advancement of Engineering Education (CAEE), a national research center that was funded from 2003-2010. Her research focuses on engineering design learning, considering context in engineering design, and the use of reflection to support learning. She is a fellow of the American Association for the Advancement of Science (AAAS) and the ASEE. Dr. Atman holds a Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

Session Description

What does design look like? How do designers spend their time scoping out a problem, developing alternative solutions, and evaluating their designs? Are there typical patterns of engagement in design activities that differ depending on level of design expertise? Questions such as these guided Cynthia Atman's early research on engineering-design processes.

To address these questions, Atman worked with many colleagues to collect data from a large number of individuals ranging in expertise who solved multiple design problems. Analysis of these data provides empirical evidence that as individuals gain expertise as designers, they engage in different patterns of design behavior. In recent years, she has been focusing on ways to bring these research results into the complex process of design teaching. What ties the efforts together is the following idea: Every instance of a design process can be represented with a design signature – a tracing of design activities over time that can be represented as a timeline. These representations are effective tools for teaching undergraduate engineers to be aware of their own design processes.

In this presentation, Atman will share her “research-to-practice” journey from doing detailed, specific research on design expertise to navigating the complicated world of design teaching. She will talk about some of her detours and side paths along the way, and the amazing communities that she has had the privilege to work with. Her hope is that listeners can relate to the challenges and joys of her research-to-practice journey and/or be inspired to try out the idea of design signatures in their teaching.

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