

IEEE ISMAR 2026 Tutorial Proposal

Emerging Reviewing and Publication Models to Promote Trustworthy Research and Support Scientific Career Advancement

Organizer / Instructor: J. Edward Swan II (swan@acm.org)

Preferred Length: Half-Day

Preferred Date: No preference

Presentation Mode: Physically in Bari

Motivation / Description

Is anyone actually happy with the way that peer review is currently implemented? When I have asked this question during the previous times that this tutorial has been offered, at VR 2025 and VR 2026, nobody was. For reviewers, requests to perform ever-increasing numbers of reviews are unceasing. For editors, recruiting reviewers is ever more difficult. For authors whose work is accepted, the review process might be okay (for now), but about 75% of all submissions to the VR and ISMAR conferences receive the wrong answer (from the authors' point of view). Of course, authors of rejected papers often resubmit, leading to yet more review requests. Generally, everyone is burned out and unhappy. And on top of all of this is the specter of AI cranking out endless fraudulent papers. Does anyone think that human reviewing can keep up with AI?

This situation leads to many problems. Authors are rewarded for novel results that are positive and tidy, and (especially) experiments that report statistically significant results. Also rewarded are minimal results, leading to more papers. There is little motivation to share data, materials, and code. All of this has a negative impact on the overall research enterprise. It has led to low research credibility, including the *replication crisis*, where many results cannot be replicated by others. When mistakes in published research are discovered, there is little motivation to correct them, and no way to correct what archived in our standard digital libraries. Together with the fact that paper and citation counts are important for career advancement, the author reward system creates incentives for predatory journals, paper mills, and research fraud.

However, there are reasons for optimism. Many research communities, including our own, are experimenting with new reviewing and publication ideas and models. This tutorial discusses the social context that mediates scientific communication, including reviewing practices for scientific papers and proposals, and how these practices motivate researchers as they seek career success. The tutorial surveys current and emerging thinking on how this context might be optimally tuned to produce scientific results that are trustworthy and lead to scientific career advancement.

Organizer / Presenter

J. Edward Swan II

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Director, Spatial Perception and Augmented Reality (SPAAR) Lab

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Organizer qualifications: This topic is also informed by the instructor's previous tutorials and workshops that discussed the *replication crisis* in empirical science, and covered efforts from different fields to describe, measure, and address the problem.

Finally, over the past 10+ years the instructor has held a series of professional and academic leadership positions that have allowed him to take a broader perspective on the social context of reviewing practices and how they affect the health and vitality of research communities. The instructor hopes to bring some of these perspectives and lessons to the tutorial as well.

J. Edward Swan II is the Virginia Carron Eiland and Brent Eiland Professor of Computer Science and Engineering at Mississippi State University. He previously served in the administrative roles of Interim Associate Dean of Research for the Bagley College of Engineering (2024–26), and Interim Department Head (2017–18). He holds a B.S. (1989) degree in computer science from Auburn University and M.S. (1992) and Ph.D. (1997) degrees in computer science from Ohio State University, where he studied computer graphics and human-computer interaction. Before joining Mississippi State University in 2004, he spent 7 years as a scientist at the Naval Research Laboratory in Washington, D.C. His research has centered on the topics of augmented and virtual reality, perception, data science, empirical methods, human-computer interaction, human factors, and visualization. Currently, he is studying the perception and technology required to give virtual objects definite spatial locations, including depth and layout perception and depth presentation methods. He is also studying efficient data science tools. His research has been funded by the National Science Foundation, the Department of Defense, the National Aeronautics and Space Administration, the Naval Research Laboratory, and the Office of Naval Research. Swan is a member of ACM, IEEE, and the IEEE Computer Society. He has served many roles in the Visualization and Graphics Technical Communities (VGTC) of IEEE Virtual Reality (VR), IEEE International Symposium on Mixed and Augmented Reality (ISMAR), and IEEE Visualization. He is currently the chair of the IEEE VR steering committee. Previously, he served as one of the general chairs of VR 2021 and VR 2020, as well as a program chair for ISMAR 2017, ISMAR 2016, VR 2015, and VR 2014, and he was a member of the ISMAR steering committee. His scholarship and service have been recently recognized by induction into the 2024 Class of the VGTC Virtual Reality Academy, the 2023 VGTC Virtual Reality Service Award, and the 2022 ISMAR Impact Paper Award.

Target Audience

The tutorial is potentially relevant for all conference attendees. It does not require technical knowledge beyond general scientific training.

Universal topic: Reviewing and publication is a universal issue that affects everyone in the XR community.

Important for senior attendees: Senior conference attendees, who have influence over reviewing and decision processes for the conference, as well as promotion criteria at their home institutions, may find that the material gives them a broader basis for leadership and decision making in both realms.

Important for junior attendees: Junior conference attendees and students may also find the material helpful as they strategize about their own need to publish and achieve career growth. They are the generation of researchers who will have to most directly face and eventually solve the discussed reviewing, publication, and career challenges.

Timely topic: The issues of reviewer burnout, generative AI, and the need to take better advantage of digital publishing make the topic timely and important.

Outline of Tutorial

- A brief history of scholarly publishing and reviewing models, from the 17th century to today
- Paper-based publishing models and their negative consequences in the era of digital media
- An examination of the current reviewing model we use
- Alternative *reviewing models*, including:
 - Independent reviewer scoring
 - Single-blind versus double-blind reviewing
 - Non-anonymous reviews (e.g., the *Frontiers* journal)
 - Public reviews (e.g., many journals in the *Nature* portfolio)
 - Public and signed reviews (e.g., the *F1000Research* journal)
- Alternative *publication models*, including:
 - Archive-and-revise (e.g., *arXiv*)
 - Open access and related digital publication categories
 - The perceived importance criterion and the *PLOS One* model
- Even more radical reviewing and publication models:
 - Reproducible research, *p*-hacking, and preregistered research plans
 - Peer reviewed pre-registered plans and changing author incentives from producing a publishable story to producing an accurate story
 - The *Lifecycle Journal* concept, including multiple review stages, combining human peer review with AI automated peer review, and credibility building through evidence of research lifecycle evaluation
- The potential positive consequences of emerging review and publication models
- Reasons for optimism: How online publishing and ideas such as lifecycle journals can move beyond paper-based procedures, leading to research with improved credibility, built-in self-corrective processes, improved reward systems, improved reviewing procedures, reduced incentives for fraudulent publication services, and better support scientific career advancement

We are not the only scientific community facing these challenges, so a goal of this tutorial is to examine solutions that are being proposed by other communities. In addition, the tutorial will cover the latest thinking from the open science community, a group of scholars that consider the scientific process broadly as a social context that mediates scientific communication.