

MISSOURI S&T

Center for Science,
Technology, and Society

Let's Talk Research

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Mission

The CSTS is comprised of researchers and students from disciplines across Missouri S&T who work together to address **critical issues raised by technical innovations and problems from a global, human-centered perspective.**

The CSTS advances research in areas where science and society intersect and supports work that presents scientific and technical ideas to general audiences.

The CSTS fosters creative intellectual collaborations among those in STEM fields, humanists, and social scientists. We bring together diverse perspectives to solve problems of practical importance, conceptual significance, and broad societal concern.

Science, Technology, and Society

STS is a discipline unto itself with a deep literature and long history, with scholarship from at least the 1930s and as a formalized academic field since the 1970s.^{[1](#)}

e.g., Thomas Kuhn, Bruno Latour, Donna Haraway, Ian Hacking

It is an interdisciplinary field that seeks to **critically assess** the practice of science, the process of creating scientific knowledge, and the implementation of technology within society.

CSTS Members

- Faculty members who identify primarily as STS scholars are a small core of our group, including
 - [Jeff Schramm](#): modern industrial technology history
 - [Kate Sheppard](#): history of science; knowledge creation in scientific networks
 - [Alanna Krolkowski](#): policy for science, technology, and innovation; transnational technology transfers
 - Patrick Gamez: philosophy of science and technology; ethics of technology
 - [Denise Baker](#): psychology, technology, and society; public perceptions of science and technology
 - [Carleigh Davis](#): digital rhetoric; technical and scientific communication
- Faculty whose research intersects in theory or practice with STS scholarship are the majority of our members at S&T and come from departments across the university.
 - Many are members in other campus centers.

Center Functions

Scholarly Networking

- Research collaboration across campus and beyond: CSTS members strengthen research projects, contributing with
 - Convergence research
 - Transdisciplinarity
 - Translation and responsible innovation
 - Sociotechnical expertise
 - Evaluation and application
 - Broader impacts
- Meetings and Symposia:
 - NSF-funded Symposium (April 16, 2021): “The Futures of STS in Engineering and Polytechnic Universities.”

Assembling convergent research teams to tackle important social and scientific challenges is an acknowledged best practice, so how should STS researchers embrace convergent research endeavors in order to add value and lead inquiries into areas of new and developing knowledge?
 - Biomedical Humanities Symposia (April 2018, 2019)
 - 41st Humanities & Technology Association Conference: “Technologies of the Everyday” (November 8-9, 2019)

Scholarly Networking, cont.

- Speakers such as
 - **Dr. Danya Glabau** Interim Director of Science and Technology Studies, NYU Tandon School of Engineering
 - **Dr. Fred Rottnek** Professor and Director of Community Medicine, and Program Director of the Addiction Medicine Fellowship, St. Louis University School of Medicine
 - **Dr. John Parker** Program Director at the National Science Foundation, Division of Social and Economic Sciences

Seed Grants and Research Support

- Support 3-5 member projects each year
- Projects must involve at least two members of CSTS, preferably from different disciplines in STS-related projects
- Goal of start-up preparation for larger external grants

Auxiliary Functions

- Student Research
- Curriculum development
 - STS minor
 - STS undergrad certificate (proposed)

Seed Grant Funded Research Projects

“Virtue Ethics and Artificial Intelligence: How does the Dispositional Character of an AI Agent Change Moral Attributions?”

Completed 5/31/2020 Funding: \$4,733

Investigators: Dr. Daniel B. Shank (Psych) and Dr. Patrick Gamez (ALP)

Conducted two major online experimental studies (after pilot tests), manipulating the actor (AI or human) and the behavior (ethical or unethical) within scenarios and measuring the respondents' rating of the virtuous character of the actor. In general the AIs were characterized as less virtuous in the ethical scenarios and less vicious in the unethical ones according the quantitative and qualitative analysis.

Developed a philosophical argument about AI actors being included in moral community, but not with the full moral expectations of humans.

Outcomes:

- 5 students involved in research, with 2 as co-authors and 1 as a FYRE researcher
- 3 national-level conference presentations
- 3 peer-reviewed journal article publications

“Creating Risk Awareness of Tornado Disasters to Increase Homeowners’ Preparedness and Property Reinforcement through Virtual Reality Animation”

Completed 5/31/20

Funding: \$7,500

PI: Dr. Grace Yan (Civil, Architectural and Environmental Engineering, Director of Wind Hazard Mitigation (WHAM) Laboratory). Co-PIs: Dr. Fiona Nah (BIT), Dr. Nancy Stone (Psych), Dr. Hongxian Zhang (BIT)

Investigated the dynamics of tornadoes and wind effects of tornadoes on civil structures, and the corresponding structural responses. To achieve tornado-resilient communities, the PI will provide communities with virtual reality (VR) animations to experience tornado disasters virtually and to visualize personal potential risks, thus increasing the community’s likelihood of reinforcing their houses or building more tornado-resistant houses.

Outcomes:

- 3 graduate students involved in research
- 5 journal papers and 3 conference papers published; 3 journal papers under review
- Contributed to 2 external proposals:
 - NOAA grant for \$400,000 (Sept 2020-2022)
 - NSF Humans, Disasters and Built Environment Program for \$450,000 (pending)

Other Affiliated Research Projects: a Variety of Disciplinary Perspectives

- Teaming Transplant Professionals and Artificial Intelligence Tools to Reduce Kidney Discard, National Science Foundation. C Canfield, C Dagli, DB Shank.
- Optimization of Coordinated Care for Rural Comprehensive Cancer Centers, National Science Foundation. E. Cudney with A. Gosavi and C. Kueny.
- Engaged Student Learning: Students on a “Quality Quest”: Assessing Gamification in Education, National Science Foundation. E. Cudney with S. Murray.
- Technology and Human Interventions for Self-Escape in Underground Mine Emergencies, CDC-NIOSH. DA Baker.
- Inventory of night-flying pollinators at Bryant Creek State Park, Douglas County, Missouri, MO Dept of Natural Resources. R. Verble.
- Smart Home Technology Diffusion in a Living Laboratory. Journal of Technical Writing and Communication. MD Wright and D. Shank.
- The balance between vision and touch. Journal of Mathematical Psychology. D. Burns.
- Opportunities and Challenges for Rural Broadband Infrastructure Investment, Proceedings of the American Society for Engineering Management. C. Canfield.
- “Trying desperately to make myself an Egyptologist”: James Breasted’s Early Scientific Network, Communities and Knowledge Production in Archaeology. K. Sheppard.