

The Journal of Technology Studies

A refereed publication of *Epsilon Pi Tau* The International Honor Society for Professions in Technology.

Jerry Streichler, Founding Editor and Publisher from 1977-2006

Editor

Marvin Sarapin
Department Head,
Computer Graphics Technology
College of Technology
Purdue University

Co-Editor

Mihaela Vorvoreanu
Computer Graphics Technology
College of Technology
Purdue University

Note: Editorial queries should be directed to: The Editor, Journal of Technology Studies, Technology Bldg., Bowling Green State University, Bowling Green Ohio, 43403, email: jots@bgsu.edu

Editorial Board

David Batts
East Carolina University
230 Slay Building
Greenville, NC 27858
252.328.9673
battsd@ecu.edu

Ivan T. Mosley, Sr.
2 Pipers Glen Vt.
Greensboro, NC 27406
Phone: (336) 285-6468
mosleyivant@gmail.com

Karen Birch
Representing the Board of Directors
CT Community Colleges
College of Technology/Regional
Center for Next Generation
Manufacturing
61 Woodland St.
Hartford, CT 06105
860.244.7608

Luke J. Steinke
School of Technology
Eastern Illinois University
600 Lincoln Avenue
Charleston, IL 61920
217.581.6271
lsteinke@eiu.edu

Aaron C. Clark
Department of Math, Science &
Technology Education
North Carolina State University
Box 7801, 510K Poe Hall
Raleigh, NC 27695
919.515.1771
aaron_clark@ncsu.edu

Shawn Strong
Technology and Construction
Management Department
Missouri State University
901 S. National Rd.
Springfield, MO 65897
417.836.5121
shawnstrong@missouristate.edu

Jenny Daugherty
Technology Leadership and Innovation
Purdue University
Ernest C Young Hall, Room 443
West Lafayette, IN 47907
765.494.7989
jlauge@purdue.edu

Jeffery M. Ulmer
University of Central Missouri
Grinstead 014A
Warrensburg, MO 64093
600.827.2473
julmer@ucmo.edu

Jeremy V. Ernst
Department of Teaching and Learning
Virginia Polytechnic Institute and State
University
315 War Memorial Hall
Blacksburg, VA 24061
540.231.2040
jvernst@vt.edu

Staff for this Issue

**Editorial
Consultant**
Lee Meiser

Publisher
Epsilon Pi Tau

Art & Layout
Knappe Designs

Office Manager
Susan Pickens

The Journal of Technology Studies (JTS) (ISSN 1071-6048) is the flagship, peer-reviewed journal of Epsilon Pi Tau, Inc., a nonprofit, academic and professional honor society. Headquarters and editorial offices are located at the Technology Building, Bowling Green State University, Bowling Green, OH 43403-0296. Use this address or jots@bgsu.edu for subscription matters or purchases.

Copyright 2012 by Epsilon Pi Tau, Inc.

The opinions expressed by the journal's authors are not necessarily those of the Board of Directors, staff, or members of Epsilon Pi Tau.

Two print issues per year are mailed to all members of the society upon request and to academic and general libraries around the globe. Issues that are published online only, the aforementioned printed issues, and past issues are available online at scholar.lib.vt.edu/ejournals/JTS.

The journal is currently indexed in Current Index to Journals of Education (USA), International Bibliography of the Social Sciences (IBSS) (UK), and the International Vocational Education and Training and Research Database at <http://www.ncver.edu.au> (Australia).

Separate articles or complete issues are also available in a variety of media forms from National Archive Publishing Company, P.O. Box 1346, Ann Arbor, MI 48106-1346, EBSCO Publishing, 10 Estes Street, Ipswich, MA 01938-0682, USA, and ERIC, 655 15th Street NW Suite 500, Washington, DC 20005, USA.

The JTS welcomes original manuscripts from scholars worldwide focused on the depth and breadth of technology as practiced and understood past, present, and future. Epsilon Pi Tau, as perhaps the most comprehensive honor society among the technology professions, seeks to provide up-to-date and insightful information to its increasingly diverse membership as well as the broader public. Authors need not be members of the society in order to submit manuscripts for consideration. Contributions from both academics and practitioners are equally welcome.

A general guide to the breadth of topics of potential interest to our readers can be gained by consideration of the 17 subclasses within "Technology" of the classification scheme of the Library of Congress, USA <lcweb.loc.gov/catdir/cpsol/lcco/lcco_t.pdf>. This includes engineering and allied disciplines, informatics in its many manifestations, industrial technology, and education in and about technology.

Authors are strongly urged to consult the journal's "Guidelines for Authors," included in this publication, or available at the society's web site (www.epsilonpitau.org) or provided upon request. It provides additional details on the breadth and nature of topics of interest, the journal's scholarly writing standards, submission guidelines, and review and publication processes.

Printed in the United States of America by Kennedy Printing Company, Findlay, Ohio.

Board of Directors

Region 1 (The nations of Europe, the Eastern Provinces of Canada, and the Northeastern United States)

Thomas P. Bell
Department of Industry and Technology
P.O. Box 1002
Millersville University
Millersville, PA 17551
717.871.2301
fax: 717.872.3318
thomas.bell@millersville.edu

Region 3 (All members-at-large, the Canadian Province of Ontario, and the North Central United States)

Todd D. Myers
Russ College of Engineering
Technology and Management Department
Ohio University
124b Stocker Center
Athens, OH 45701
740.593.1455
myerst2@ohio.edu

Region 5 (Australia, the island nations of the Pacific and Indian Oceans, the nations of Asia, the Yukon Territory and Western Provinces of Canada, and the Western United States)

Sam C. Obi
Department of Aviation and Technology
San Jose State University
One Washington Square
San Jose, CA 95192
408.924.3218
fax: 408.924.3198
sobi@email.sjsu.edu

Executive Director

Kevin R. Howell
Department of Technology
Appalachian State University
Boone, NC 28608
Phone: 828.262.3114

Region 2 (The nations of Africa, the Caribbean Islands, and the Southeastern United States)

Eric F. Reichard
Department of Technology and Environmental
Design
Appalachian State University
Katherine Harper Hall
ASU Box 32122
Boone, NC 28608
Phone: (828) 262-6360
Fax: (828) 265-8696
reichardef@appstate.edu

Region 4 (The nations of Central and South America, the Northern Territory and Central Provinces of Canada, and the Central United States)

Charles V. Schwab
Iowa State University
Agricultural and Biosystems Engineering
Department
220 Industrial Education II
Ames, IA 50011-3130
515.294.4131
fax: 515.294.1123
cvschwab@iastate.edu

Two-Year Institutional Director (Representing all Community and Technical Colleges)

Karen Wosczyzna-Birch
CT Community Colleges
College of Technology/Regional Center for Next
Generation Manufacturing
61 Woodland St.
Hartford, CT 06105
860.244.7608
karenlee@snet.net