

# ISAM 2018

## Proceedings of the 3rd International Symposium on Academic Makerspaces

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All PDFs can also be accessed directly in [a shared folder](#).

### Papers

#### **Slaying Dragons: An Empirical Look at the Impact of Academic Makerspaces**

Ethan C. Hilton, Craig R. Forest, and Julie S. Linsey

Woodruff School of Mechanical Engineering, Georgia Tech

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#### **Affordances of Immersive Design Challenges in Academic Makerspaces**

Juan Torralba, Rob Rouse, Katie Krummeck, and Rickey Crum

University of Miami and Southern Methodist University (SMU)

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#### **Making Connections: Project Courses Improve Design Self-Efficacy and Interdisciplinary Awareness**

Leah F. Rosenbaum, and Björn Hartmann

University of California

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#### **Extending the Reach of Academic Makerspaces into K-12 Schools: Delivering Maker-Based Instruction with a Mobile Makerspace**

Rob Rouse, Katie Krummeck, DiMitri Higginbotham, and Rickey Crum

Southern Methodist University

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**Maker Competencies and the Undergraduate Curriculum**

Martin K. Wallace, Gretchen Trkay, Katie Musick Peery, Morgan Chivers, and Tara Radniecki  
University of Texas at Arlington Libraries and University of Nevada, Reno DeLaMare Library

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**MakerLens: What Sign-In, Reservation and Training Data Can (and Cannot) Tell You About Your Makerspace**

Eldon Schoop, Forrest Huang, Nathan Khuu, Bjoern Hartmann  
University of California, Berkeley

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**Guiding Principles for Designing an Accessible, Inclusive, and Diverse Library Makerspace**

Fang Yi and Melinda Baumann  
University of Virginia Library

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**Towards a Design Space of Short-Session Making Workshops for Middle School-aged Students**

Johanna Okerlund, Madison Dunaway, Caleb Roenigk, and David Wilson  
University of North Carolina at Charlotte

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**Growing A Network of Makerspaces in California Community Colleges: Moving Towards Implementation and Adoption**

Carol Pepper-Kittredge, Deborah Bird, Brie Lindsey  
Sierra College, Pasadena City College, and California Council on Science and Technology

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**Santa Maria's Central Coast Makerspace Collaborative: A Network of Internal and External Partners**

Robert D. Mabry, Suzanne M. Valery, and Brie J. Lindsey  
Allen Hancock College and California Council on Science and Technology

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**Making Across the Curriculum: Multidisciplinary Making at Folsom Lake College**

Zachary J. Dowell and Brie J. Lindsey  
Folsom Lake College and California Council on Science and Technology

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**Quantifying the Changes in Shop-User Demographics and Interdisciplinary Activity After a Makerspace was Added**

Lennon Rodgers, and Karl Williamson

University of Wisconsin - Madison

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**An Exploratory Case Study of Cross-Disciplinary Project-Based (i.e. Maker) Curricula as a Catalyst for Entrepreneurship**

Aaron Kishbaugh

James Madison University

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**A Review of the Data Collection Methods Used at Higher Education Makerspaces**

Ramy Imam, Leonard Ferron, and Amit S. Jariwala

Georgia Institute of Technology

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**Teacher Education in the Makerspace: A Synthesis of Peripheral Literature**

Josh Corbat

The University of North Carolina at Chapel Hill

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**Intentionally Cultivating Diverse Community for Radically Open Access Makerspaces**

Katie Musick Peery and Morgan Chivers

University of Texas at Arlington Libraries

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**The Role of Makerspaces in Product Development of Hardware Start-Ups:  
A case study in Europe's largest academic makerspace**

Matthias Friessnig, Lana Handy, and Christian Ramsauer

Graz University of Technology and UnternehmerTUM MakerSpace

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**Five Misperceptions You Need to Overcome When Starting a Makerspace**

Peter Mylon, Ryan G. Jones, William Proud, and Gary C. Wood

University of Sheffield

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**Development of a Smartphone Application for Makerspace  
Management**

Nick Rupert, and Amit S. Jariwala

Georgia Institute of Technology

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**CAIRN: A Tangible Research Tool to Materially Visualize Practices in a Makerspace**

Fayard, A-L, Bill, V., Kush, S., and Nicolas, M.

New York University

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**Academic makerspaces as preparation for careers in industry**

Maha N. Haji and Margaux Filippi

MIT

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**Models for curricular integration of makerspaces**

Malcolm Cooke, Craig R. Forest, Björn Hartmann, Aaron M. Hoover, Jonathan Hunt, Marlo Kohn, Martin L. Culpepper, and Vincent Wilczynski

Case Western Reserve University, Georgia Institute of Technology, University of California, Berkeley, Olin College of Engineering, Massachusetts Institute of Technology, Stanford University, and Yale University

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## Extended Abstracts for Posters

**Connecting Students and Seniors to Solve Real-World Challenges using 3D Printing**

Niti T. Parikh, Jane Swanson, My Linh H. Nguyen-Novotny

Cornell Tech Maker Lab and Weill Cornell Medicine CTSC

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**A Pilot Study of Hierarchical Curriculum Structure in Academic Makerspaces**

Seong-Woo Kim

Seoul National University

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**Launching and Running an Interdisciplinary Academic Makerspace in a University**

**Library: Data from the First Year**

Kerry Harmer

Mount Royal University

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**Supernode: Experiences of an Unsupervised, Student-run Makerspace**

Richard Lin and Derek Chou

University of California, Berkeley

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**In and Out of Class: Differences Among Undergraduate Students' Conceptions of Prototyping Approaches at Academic Makerspaces**

Hadi Ali, Micah Lande

Arizona State University

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**Engineering Students Perceived Value of Makerspaces in Relation to Future Career Preparation**

Kate Youmans, Idalis Villanueva, Louis Nadelson, Janna Bouwma-Gearhart, Adam Lenz, Sarah Lanci

Utah State University, University of Central Arkansas, Oregon State University, Colorado Mesa University

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**The UC Davis Product Design Lab: Sustainability, Inclusivity, and Creative Exploration**

Beth Ferguson, Tom Maiorana, Katia Vega, Christina Cogdell

University of California Davis

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**Entrepreneurial Journeys Through the Makerspace and Beyond**

Fi Tschaut and Mel Wimborne

Michael Crouch Innovation Centre, UNSW Sydney

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**Creative Strategies for Community Engagement**

Danianne P. Mizzy, Tricia Maloney, Therese F. Triumph, Megan G. Kilb

Cornell University Library and UNC-Chapel Hill Libraries

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**Material Flow in Makerspaces**

Jasper O'Leary and Nadya Peek

University of Washington

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**Enforcing Innovation across Maker, Industry and Research Using Capabilities of Academic Makerspaces**

Hans Peter Schnöll, Thomas Wildbolz, and Christian Ramsauer

TU Graz

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**Building Student Engagement Through an Intensive Summer-Long Design/Build Experience**

Aaron M. Hoover, Daniela Faas  
Olin College of Engineering  
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**Interdisciplinary Collaboration: Adding Authentic Stakes to Student Learning**

Katherine Goodman and Andrew J. Henderson  
Inworks, University of Colorado Denver  
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**Informal Learning Pathways: Supporting Informed Decision Making in Makerspaces**

Kathryn E Shroyer  
University of Washington  
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**Inclusive Making: Community Based Experiential Learning and Innovation as a Platform for Social Justice**

Mohamed Haroun, Alexander Dillon Gaudio, Salah Chafik, and Maxwell Johnson  
Columbia University, Carnegie Mellon University, Tallinn University of Technology  
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**Barriers to Equity in Makerspaces**

DiMitri Higginbotham  
Southern Methodist University Maker Education Project  
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**Academic Biomaking: Training in the integrated making of, for, and with biology**

Andrew I. Yao, Steven Lucero, and Marc T. Facciotti  
University of California, Davis  
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**Beyond general workshop safety: skill-building workshops in a makerspace**

Joey Gottbrath and Emily Rice  
UC Berkeley  
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**Designing an Experiential Learning Course Utilizing Makerspace Tools**

Sadaf Ashtari, Emily Merrifield, Ronald Coleman, and Genevieve Sparks  
California State University, Sacramento  
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### **Student Self-Assessment of Modern Making Skills**

Diana Haidar

Carnegie Mellon University

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### **Innovation Center – Makerspaces for Transformation of Mechatronics Engineering Program**

Nengsheng Bao, Xiaodong Niu, Shaoke Chen, Li Chen, Runtian Li and Peihua Gu  
Shantou University and San San Intelligent Technology Co.

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### **Open Soft Machines: Challenges for sharing recipes of soft robots**

Young ah Seong, Hiroshi Sugihara, Ryuma Niiyama, and Yoshihiro Kawahara  
University of Tokyo

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### **The Necessary Creation of “Pre-Entrepreneurs” in India: Maker Training in Schools to Develop Future Entrepreneurs**

R. Nair, J. E. Corpus, and P. Samaniego  
Asia School of Business in collaboration with MIT-Sloan

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### **Enabling Students to Build and Customize Helping Hands for Children with Limb Differences**

Kyle Manning, Johanna Okerlund, Richard Chi, and David Wilson  
UNC Charlotte

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### **Distributed Cognition as a Theoretical Lens for the Design of Makerspace Tool Kits**

Kathryn E Shroyer  
University of Washington

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## **Extended Abstracts for Student Project Posters**

### **Solar Maize Dryer for Subsistence Farming in Huehuetenango, Guatemala**

Mayari Pérez  
Universidad del Valle de Guatemala

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### **Development Of A Sifting Machine Using A Slider-crank Mechanism**

Martínez D., Archila, M., Fuentes, O., Velásquez. A., Villafuerte. A.

Universidad del Valle de Guatemala

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**New Jersey Institute of Technology Makerspace Machine Access Control**

Richard M. Rakus, Robert Burghart, Zachary Kaplan, Hasan Intisar

New Jersey Institute of Technology

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**Synthetic Biology at UC Davis: A Model for Student Involvement and Leadership in a Biomaker Space**

Alexander R. Krueger, Lisa R. Illes, and Marc T. Facciotti

UC Davis

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**Using the Makerspace to Create Educational Open-source Software for Electrical Circuits: A Learning Experience**

Dana Conard, Blake Vollmer, Corbin Shatto, Hannah Bowman, and Sara Kassis

Sonoma State University

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**Reimagining Onboard Experiences for Autonomous Vehicles in Academic Makerspaces**

P. Cholsaipan, S. Hyoun, M. Kumaran, T. Liaw, K. Pham, J. Tabuada, E. Kim, A. Agogino

University of California, Berkeley

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**Inventing Assistive Technology for Eye Disabilities in Makerspaces**

Vivian Liu

University of California, Berkeley

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**Level Sightlines & Self-Discovery: A Case Study in Makerspace Accessibility**

Theodore G. St. Francis

MIT & Stanford University

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**Measuring and Predicting Achievable Tolerances for AM Processes**

Yilin Sun, Hannah Budinoff, and Sara McMains

University of California, Berkeley

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**OverShoot: Inspiring Casting Projects in an Educational Foundry**

Ari Bennett



Stanford University  
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**Opi-Aid: Building a Better Opioid Screen**

Sophia T. Liang and Alexander Kot  
UC Berkeley and UC San Francisco  
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## Videos

**UTA Libraries FabLab | FabApp**

Katie Peery  
University of Texas at Arlington  
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**Library Makerspaces: Outreach & Programming for the Whole Campus**

Rich McCue and Dani Johnson  
University of Victoria Libraries  
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**CAIRN: A Tangible Research Tool To Materially Visualize Practices in a Makerspace**

Shrishti Kush, Maddie Nicolas, Anne-Laure Fayard, Victoria Bill  
New York University  
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**Empowering Undergraduates: Building Sustainability in Concept and Reality**

Tom Maiorana, Jiayi Young, Beth Ferguson  
University of California, Davis  
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**Electric Drive Solar Kiosk: an innovative combination of solar technology, public art and civic place making**

Beth Ferguson and Dallas Swindle  
UC Davis and University of Texas at Austin  
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**Making a Makerspace Part II**

Zamora, Michelle  
Sacramento City College  
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**Engineering a Championship Team**

Geringer, Steven

Yale School of Engineering & Applied Science

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**UnternehmerTUM MakerSpace Tour**

Friessnig, Matthias

UnternehmerTUM MakerSpace

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**David's Ankles**

Faulkner, Lee

Yale University

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**"The Maker's Journey: COMPLETING THE INCOMPLETE STORY"**

Samaniego, Ponce Ernest

Asia School of Business

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**The Hackaday Prize: Student Makers Changing the World**

Tranovich, Stephen

Hackaday

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**D-HIVE: Promoting a Culture of Innovation**

Rocha, Angelica

Universidad del Valle de Guatemala

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