October 11, 2018

Dear Symposium Participants,

Welcome to the National Federation of the Blind Jernigan Institute for the Tactile Graphics in Education and Careers Symposium! The broad range of topics that will be discussed over the next two days reflects the tremendous growth that has occurred in the field over the last decade.

Tactile fluency is a critical skill for the success of blind students in science, technology, engineering, art, and mathematics (STEAM), as well as for success in employment. As advances in production methods and materials result in the increased use of tactile graphics in the classroom, it is vitally important that parents and teachers have access to the information they will need to teach blind children how to interpret and use tactile graphics.

Hosting the Tactile Graphics in Education and Careers Symposium is one of the many ways the National Federation of the Blind works to promote tactile fluency so that blind Americans can attain the skills they need to live the lives they want. From toddler to teenager, our programs for blind children encourage them to color and to draw. In addition, we work with researchers, educational products and services companies, and technology developers to continue the expansion of the tactile graphics frontier.

Significant strides have been made in breaking down the access barriers to STEAM subjects that blind people encounter through the advances made in tactile graphics materials and production methods, and their incorporation into classroom instruction. However, much work remains to be done. Please feel free to reach out to me with ideas on how we may collaborate as we work to achieve equality of access to information for blind Americans.

Sincerely,

Mark A. Riccobono, President
National Federation of the Blind

MARK/LB
THURSDAY, OCTOBER 11, 2018

8:15–8:20 AM  Welcome and Introductions
Lou Ann Blake, deputy executive director, National Federation of the Blind Jernigan Institute

8:20–8:45 AM  Theme Keynote
Mark Riccobono, President, National Federation of the Blind

8:45–10:00 AM  Teaching and Learning Tactile Literacy
Presenters: Kathleen Michaelson, TVI, Braille specialist, Florida School for the Deaf and Blind; Jenoise Callahan, art instructor, Colorado Center for the Blind

10:00–10:15 AM  Break

10:15–11:15 AM  Making the Universe Accessible: Tools to Make Astronomy and Astrophysics More Accessible to People Who Are Blind or Visually Impaired
Presenter: Henry Winter, astrophysicist, Smithsonian Astrophysical Observatory

11:15–11:30 AM  Break

11:30 AM–12:30 PM  Using Robots to Create Tactile Learning Experiences
Presenters: Shaun Kane, associate professor; Darren Guiness, PhD student; and Annika Muehlbradt, PhD student—University of Colorado Boulder

12:30–1:45 PM  Lunch and Keynote
Craig Meador, President, American Printing House
1:45–2:45 PM

Breakout Session I

1. Tactile Representation and Production Methods Part 1
   Location: Fourth Floor Conference Room
   Presenters: Naomi Rosenberg, senior designer; BJ Epstein, project manager; Frank Welte, accessible media specialist; and Caitlin O’Malior, alternate media specialist—San Francisco Lighthouse for the Blind and Visually Impaired; Ann Cunningham, artist and tactile art teacher, Colorado Center for the Blind; Abigale Stangl, PhD candidate, University of Colorado Boulder

2. Touching the Future: Graphiti
   Location: Pimlico Conference Room, 4th Floor
   Presenters: Ken Perry, software engineer, American Printing House for the Blind; Venkatesh Chari, president and CTO, Orbit Research; Jeanette Wicker, core curriculum project leader, American Printing House for the Blind

3. Sensables: 3D Printed Models for Visually Impaired Students
   Location: Round Conference Room, 4th Floor
   Presenter: Lei Shi, PhD candidate, Cornell Tech

4. Addressing Diverse Learner Needs through Multimodal Access
   Location: Zaborowski Conference Room, 4th Floor
   Presenters: Sue-Ann Ma, project director, DIAGRAM Center at Benetech; Nicole Johnson, PhD student, University of Colorado Boulder

2:45–3:00 PM

Break

3:00–4:00 PM

Breakout Session II

1. Tactile Representation and Production Methods Part 2
   Location: Fourth Floor Conference Room
   Presenters: Naomi Rosenberg, senior designer; BJ Epstein, project manager; Frank Welte, accessible media specialist; and Caitlin O’Malior, alternate media Specialist—San Francisco Lighthouse for the Blind and Visually Impaired; Ann Cunningham, artist and tactile art teacher, Colorado Center for the Blind; Abigale Stangl, PhD candidate, University of Colorado Boulder
2. Tactile Images for Concept Building and Spatial Awareness
Location: Newell Perry Conference Room, 3rd Floor
Presenter: Dorine In 't Veld, Dedicon, the Netherlands

3. Bringing Digital Graphics to Life: The Promise of Multimodal Touchscreens—Progress and Future Work
Location: Zaborowski Conference Room, 4th Floor
Presenters: Jenna Gorlewicz, assistant professor, Saint Louis University; Corrine Mueller, co-founder, Vital; Hayden Dahmm, sustainable development data analyst, United Nations Sustainable Development Solutions Network

4. Interactive Tactile Graphics in Pre-K–12 Education
Location: Pimlico Conference Room, 4th Floor
Presenters: Michael Coleman, vice president; Michael Rosen, vice president; and Joshua Coffee, president and CEO—E.A.S.Y.
Tactile Graphics

Location: Round Conference Room, 4th Floor
Presenter: Robert Jaquiss, sales engineer, American Thermoform Corporation

4:00–4:15 PM
Break

4:15–5:15 PM
Breakout Session III

1. The Read Read—Literacy for All—Equality by Design
Location: Zaborowski Conference Room, 4th Floor
Presenter: Alex Tavares, inventor, Harvard Innovation Lab/T-Var EdTech

Location: Fourth Floor Conference Room
Presenter: Steve Landau, president and director of research, Touch Graphics, Inc.

3. Music Touch from Dancing Dots
Location: Pimlico Conference Room, 4th Floor
Presenter: William McCann, founder and president, Dancing Dots Braille Music Technology, L.P.
4. Tactile Outline Drawings: Examples, Theories, and the Limits of Our Understanding
Location: NFB of Utah Auditorium, 4th Floor
Presenter: John M. Kennedy, University Professor Emeritus, University of Toronto

FRIDAY, OCTOBER 12, 2018

8:30–9:30 AM Breakout Session IV

1. 3D Printing for Blind and Low Vision Students: How to Do It
Location: Zaborowski Conference Room, 4th Floor
Presenters: Michael Cheverie, educational specialist, visual impairments, Los Angeles Unified School District; Neal McKenzie, assistive technology specialist, Sonoma County Office of Education

2. Tactile Maps Automated Production
Location: Fourth Floor Conference Room
Presenters: Naomi Rosenberg, senior designer; and Frank Welte, accessible media specialist—San Francisco Lighthouse for the Blind and Visually Impaired

3. Making Tactile Templates Talk: Let Me Count the Ways
Location: Pimlico Conference Room, 4th Floor
Presenter: Michael Kolitsky, PhD, nextgenEmedia, LLC

Location: Newell Perry Conference Room, 3rd Floor
Presenters: Abigale Stangl, PhD candidate, University of Colorado Boulder; Ann Cunningham, artist and tactile art teacher, Colorado Center for the Blind

9:30–9:45 AM Break

9:45–10:45 AM Breakout Session V

1. A Review of Tactile Graphics Repositories
Location: Round Conference Room, 4th Floor
Presenter: Robert Jaquiss, sales engineer, American Thermoform Corporation
2. Tactile Graphics on a Shoestring... and Possibly Using One
Location: Newell Perry Conference Room, 3rd Floor
Presenter: Amy Mason, access technology specialist, San Francisco Lighthouse for the Blind and Visually Impaired

3. Supporting Pre-Algebra Students with Visual Impairments to Increase Their Proficiency Obtaining Information from Graphics
Location: Fourth Floor Conference Room
Presenter: L. Penny Rosenblum, research professor, University of Arizona

4. The Right Touch: The Importance of Good Design
Location: Zaborowski Conference Room, 4th Floor
Presenter: Aquinas Pather, transcription/tactile graphics design specialist, T-Base Communications

5. The Role of Tactile Feedback from a Programmable Tactile Display in Orientation and Mobility
Location: Pimlico Conference Room, 4th Floor
Presenter: Luca Brayda, researcher, Istituto Italiano Di Tecnologia

10:45–11:00 AM Break

11:00 AM–12:00 PM Breakout Session VI

1. Tactile Graphs for Teaching the Principles of Scientific Literacy in Introductory Psychology Courses
Location: Zaborowski Conference Room, 4th Floor
Presenters: Raechel Soicher, graduate student, Oregon State University; Arielle Silverman, disabilities research and training consultant, Disability Wisdom Consulting

2. Tactile Graphics the Easy Way
Location: Fourth Floor Conference Room
Presenters: John Gardner, PhD, co-founder and president; and Carolyn Gardner, co-founder and corporate secretary—ViewPlus

3. Designing an Accessible Traveling Exhibit: A Case Study Using 3D Printed Replicas of Stone Tools from Archaeological Sites
Location: Newell Perry Conference Room, 3rd Floor
Presenters: Cheryl Fogle-Hatch, archaeologist and independent museum professional; Donald Winiecki, professor, Boise State
4. Agenda for Inclusive Media Production
Location: Pimlico Conference Room, Fourth Floor
Presenters: Abigale Stangl, PhD candidate, University of Colorado Boulder; Ann Cunningham, artist and tactile art teacher, Colorado Center for the Blind; Tom Yeh, assistant professor, University of Colorado Boulder

5. Achieving Quantity, Variety, and Responsiveness, as well as Quality
Location: Round Conference Room, 4th Floor
Presenters: Dianne Pawluk, professor, Virginia Commonwealth University; Tyler Ferro, PhD student, Virginia Commonwealth University

12:00–1:15 PM  Lunch and Keynote
Alexy Karenowska, Director of Technology, The Institute for Digital Archaeology

1:15–2:30 PM  The Creation and Use of 3D Printed Materials in the Educational Setting
Presenters: Michael Cheverie, educational specialist, visual impairments, Los Angeles Unified School District; Neal McKenzie, assistive technology specialist, Sonoma County Office of Education

2:30–2:45 PM  Break

2:45–3:45 PM  Updates on Developing a Braille Graphic Tablet for the Blind
Presenter: Brian MacDonald, president, National Braille Press

3:45–4:00 PM  Break

4:00–5:00 PM  Literacy of Tactile Graphics for Students with Visual Impairments in High School Mathematics Courses: What, Why, and How?
Presenter: Ashley Nashleanas, PhD, Iowa State University

5:00–5:30 PM  Closing Remarks and Networking
DIRECTIONS TO WORKSHOP LOCATIONS:

**Betsy Zaborowski and Pimlico Conference Rooms:** Turn left when exiting Members Hall. Take first hall on left and proceed to end of hall where NFB staff will direct you.

**Fourth Floor Conference:** Turn left when exiting Members Hall. Proceed through lunchroom to hallway where NFB staff will direct you.

**NFB of Utah Auditorium:** Turn left when exiting Members Hall and proceed down hallway to auditorium on your right.

**Round Conference Room:** Turn left when exiting Members Hall. Take first hall on left and proceed to end of hall. Make a left and proceed to end of hall, where NFB staff will direct you.

**Newell Perry Conference Room:** Exit Members Hall and return to fourth floor elevators. Take elevator to third floor and proceed through library doors, where NFB staff will direct you.
“We read braille for breakfast”

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WHAT IS THE NATIONAL FEDERATION OF THE BLIND?

Founded in 1940 by Dr. Jacobus tenBroek, the National Federation of the Blind (NFB) is the only organization that believes in the full capacity of blind people and that has the power, influence, diversity, and determination to help transform dreams into reality. We believe in blind people because we are blind people. Our democratically elected leaders and our diverse nationwide membership are made up of blind people, our families, and our friends.

When collective action is needed, the National Federation of the Blind stands ready to help blind people overcome the barriers to full participation in society. Through advocacy and, when necessary, litigation, we work to ensure that current and future technology—from ATMs to the internet—is accessible to the blind. The National Federation of the Blind also works to fight discrimination against the blind in child custody, education, employment, high-stakes standardized testing, and professional licensing matters. In addition, we assist members of the United States Congress with drafting legislation and provide testimony on issues that impact blind Americans.

In January 2004, the National Federation of the Blind opened the Jernigan Institute, a research and training institute focused on the needs of the blind and run by the blind. The National Federation of the Blind Jernigan Institute leads the quest to understand the real problems of blindness and to develop innovative programs and services that help the world’s blind achieve independence:

- **FB EQ** helps blind high school students find their "engineering quotient" by engaging them in projects that solve real-world problems and encourage them to pursue careers in science, technology, engineering, and math;
- **Braille Reading Pals Club** is a literacy program for children that fosters positive attitudes about Braille and promotes a love of reading;
- **International Braille and Technology Center for the Blind** is a comprehensive evaluation, demonstration, and training center, complete with over $2.5 million worth of nearly all of the tactile and speech output technology now available to the blind; and
- **Blind Driver Challenge®** research project has coordinated with faculty and students at the Virginia Tech Robotics and Mechanisms Laboratory to develop nonvisual interface technologies that allow a blind person to drive a car independently.

The National Federation of the Blind knows that blindness is not the characteristic that defines you or your future. Every day we raise the expectations of blind people, because low expectations create obstacles between blind people and our dreams. You can live the life you want; blindness is not what holds you back.
LEARN MORE ABOUT THE PROGRAMS OF THE NFB JERNIGAN INSTITUTE

Keep up with the work of the National Federation of the Blind through our e-newsletter, Imagineering Our Future, which highlights the programs of our Jernigan Institute, as well as National Federation of the Blind activities that are happening across the country. To receive our e-newsletter, please send an email to jerniganinstitute@nfb.org and indicate that you would like to be added to the list. You can also follow us on Facebook at National Federation of the Blind and on Twitter@NFB_voice.

Together with love, hope, and determination, we transform dreams into reality.