**2023 Agenda Science and Engineering Division of the National Federation of the Blind**

**July 3, 2023**

The Hilton Americas, Houston Texas

# Annual Meeting

The Science and Engineering Division annual meeting will be held on Monday, July 03, 2023, from 6:30 PM to 10:00 PM, in Room 343 A.

To either become a registered member of the Science and Engineering division, or to renew your membership, go to "<http://www.nfb.org/divisiondues>". The dues are $5 a year per person. Please do not make any STEM scholarship donations on this page for the NFB is not yet equipped to separate dues payments from donations on this web page.

6:30 - Registration

7:00 - Call to Order - John Miller President

7:01 - John Miller - Graphics Using Braille Displays and Hard Copy

7:15 - Venkatesh Chari - The Future of STEM Education with Interactive Multi-line Refreshable Braille

and Dynamic Tactile Graphic Displays - the Orbit Slate and Graphiti

Plus.

7:30 - Caroline - Karbowski - Making the Biochemistry Lab Experience More Accessible

7:45 - John Gardner - Blind ViewPlus Printer Users Can Now Create Tactile Patterns to Replace Color

Fill

8:00 - Nathanael Wales - Overcoming Blindness Challenges Leading in STEM

8:15 - Harry Staley - From Helpdesk to Principal Engineer: Stay Hungry and Enjoy the Ride

8:30 - Sam Dooley - the Accessible Equation Editor - A Web Application for Online Accessible Braille

Math

8:45 - Gene Kim and Dan Fan - Bridging the Data Access Gap: Multimodal Approaches Towards Data

Accessibility

9:05 - Tamer Zaid - Coping with Blindness and Short-Term Memory Loss in Education and Employment

9:20 - Business Meeting

Treasurer's Report

Secretary's Report

Division Pledges: The Jacobus tenBroek Memorial Fund supports the NFB center in Baltimore.

The White Cane Fund: These dollars go directly to the general treasury of the Federation.

The Kenneth Jernigan Fund: The proceeds from this fund are used to bring a number of

attendees to their first national convention.

Scholarship Pledges

10:00 - Adjourn.

For any questions, please contact John Miller at johnmillerphd@hotmail.com.

# A summary of the presentations follows.

## Title: Graphics Using Braille Displays and Hard Copy

Speaker: John Miller

## Title: The Future of STEM Education with Interactive Multi-line Refreshable Braille and Dynamic Tactile Graphic Displays - the Orbit Slate and Graphiti

## Plus

Speaker: Venkatesh Chari

With a background in Electrical Engineering, Venkatesh Chari has worked for over 25 years in the development of technologies involved in mobile and assistive technology products, in roles spanning engineering, management and strategic marketing.  At Orbit Research, his work has included the development of the Orbit Reader 20, the world’s first affordable refreshable braille display and the Graphiti Interactive Tactile Graphic Display.

Abstract: The Orbit Slate family of multi-line braille displays is the first and only product in the world to provide multiple lines of true real-time refreshable braille in a single, compact, tablet-sized device. It enables users to seamlessly and intuitively experience spatially arranged text and information such as spatial math problems involving fractions and mixed numbers, number line graphs, matrices and other spatially arranged information, braille music and tables in real time. With the Graphiti Plus, students can now simultaneously experience graphics and text. It is the first and only product in the world to bring interactive real-time refreshable multi-level tactile graphics and true braille together in a single device. It has 2400 pins arranged in forty rows and sixty columns to display graphics and a line of forty braille cells. It sets the bar for truly immersive and seamless access to all digital media - providing real-time refreshable graphics and text in braille. Its ability to simultaneously display graphics and braille text while allowing direct interaction with any digital content by touch offers limitless possibilities.

## Title: Making the Biochemistry Lab Experience More Accessible

Speaker: Caroline Karbowski

I currently work as a biochemist in a research lab at Ohio State University. I am really passionate about making science accessible for blind students, and I want to pursue certification in teaching blind students. I'm not blind, but I am a tactile braille reader and a certified braille transcriber. I

recently received the Bolotin Award this year for work in my nonprofit, See3D: 3D printing for the blind.

Abstract: Caroline will share tips for increasing non-visual access to biochemistry. Learn about high- and low-tech options for labeling, observing, and recording data, measuring liquids, and learning biochemistry concepts.

## Title: Blind ViewPlus printer users can now create tactile patterns to replace color fill

Speaker: John Gardner

John Gardner is known as an expert in several fields of experimental solid-state physics as well as information accessibility. He lost his sight unexpectedly in mid-career as Professor of Physics and became interested in accessibility of complex information, including math and graphics. In 1996 he founded ViewPlus Technologies, which has grown into a multi-million-dollar company producing information-access hardware and software. ViewPlus is the leading manufacturer of tactile graphics and braille embossers in the world. He has received numerous awards and has given invited presentations on both physics and information accessibility on five continents.

Abstract: We are starting a project to develop a standard for relating patterns to color and would like some “favorite pattern set” entries. One can now easily print patterns instead of the default “tactile gray scale” for color regions. I have written up a paper on color and an instruction sheet on how to make pattern files. I will give out a packet with some pattern examples.

## Title: Overcoming Blindness Challenges Leading in STEM

Speaker: Nathanael Wales

Nathanael Wales has been blind from birth. He is a civil engineer working as a project manager for the U.S. Army Corps of Engineers on flood risk management and navigation improvement projects in New York City, Long Island, and northern New Jersey out of the Corps’ New York District office. He has also had 15 years experience as a project planner for the Corps and began his civil engineering career with 5 years of experience planning dam and reservoir projects for the State of California, Department of Water Resources. Nathanael attended his first NFB National Convention in 1996 shortly after graduating from high school just as he was beginning his college engineering program. He has found the mentoring and networking within the Science and Engineering Division invaluable and enjoys the opportunity to give back what has been so generously shared with him over the years. He was an NFB National Scholarship winner in 1997 (which year he won what was then named the “computer science” scholarship) and was a second-time scholarship winner, a tenBroek Fellow, in 2000.

Abstract: Nathanael Wales, blind from birth and a civil engineer holding a professional engineer (P.E.) license, will describe his leadership journey and the experiences that brought him into a recognized STEM leadership position as a project manager for the U.S. Army Corps of Engineers. He will discuss the challenges that have met him, including blindness challenges, and how he has addressed and overcome them and the meaningful lessons he has learned.

## Title: From Helpdesk to Principal Engineer: Stay Hungry and Enjoy the ride

Speaker: Harry Staley

I currently work as a Principal Software Engineer/Data Scientist for Global Infotek Inc., a mid-size company specializing in research and development for the defense industry. I have a B.S. in Computer Science from Texas A&M University - San Antonio and am pursuing a M.S. in Computer Science from Georgia Tech.

## Title: The Accessible Equation Editor - A Web Application for Online Accessible Braille Math

Speaker: Sam Dooley

Sam Dooley is a Senior Consulting Software Engineer at Lake Pines Braille, LLC, and is the creator of the Accessible Equation Editor. "The AEE allows braille users to create documents using UEB contracted text and Nemeth braille math.  It supports file I/O, Google Drive access, clipboard cut/paste, and document export to HTML, PDF, and BRF formats.  Its accessible user interface gives sighted and braille users equal access to create and interact with online math content.

## Title: Bridging the Data Access Gap: Multimodal Approaches Towards Data Accessibility

Speakers: Gene Kim and Dan Fan

Gene Kim and Danyang Fan are both student researchers at Stanford University whose works have been presented at premier academic journals and conferences (TACCESS, ASSETS, and CHI). Gene is a junior at Stanford University studying Symbolic Systems, with a focus in Human-Computer Interaction.

He is passionate about using technology for social good and accessibility efforts. His past research contributions include auto-generated screen reader accessible data visualization, haptic wearable gloves to support remote education of blind students, and auto-generation of machine-embroidered tactile graphics. He also serves as the Secretary of the NFB's national student division and co-director of the NFB Science and Engineering mentorship program.

In his free time, you can find Gene listening to and playing music, venturing outdoors on hikes and camping trips, and experimenting with new recipes.

Dan (he/him) is a 4th year Ph.D. student and a National Science Foundation Graduate Research Fellow whose research focuses on the accessibility of data and spatial digital information for people who are blind or have low vision. He has previously worked with Microsoft Research (as an intern) to improve the accessibility of screen-shared presentations, the Stanford School of Medicine to improve the access to diagnostic tools, and the Detroit Hispanic Development Center on improving STEM education for high school students.

Abstract: The rapid growth of data information during the digital age has marked a paradigm shift in the way we perceive and consume information. As we increasingly rely on visualizations to organize, communicate, and decision-make, improving the accessibility of data visualizations is essential to social inclusion and equity. This talk will introduce the ways researchers at Stanford are confronting the data access gap, from exploring novel audio and touch-based techniques for improving graph comprehension to designing accessible STEM tools and practices that enable more flexible and critical understandings of data concepts.

These projects explore the themes of contextualization, perception, spatial reasoning, and embodied cognition as they relate to data reasoning and education.

## Title: Coping with Blindness and Short-Term Memory Loss in Education and Employment

Speaker: Tamer Zaid

I'm happy to be here with you today to share my journey of overcoming obstacles and thriving despite my disabilities. In college, I faced a unique set of challenges due to my short-term memory loss and blindness. But with determination and the support of disability services, I was able to develop alternative techniques to work around these obstacles.

I always advocated for accommodations that would meet my specific needs, such as time and a half for testing and alternative methods like braille. And when items weren't provided in a specific way, I worked with the disability office to get accessible materials. Through these experiences, I learned how to be a better problem solver, decision-maker, and critical thinker. I also discovered the power of advocating for myself and using my voice to make positive changes. Today, I'm proud to say that I've achieved my long-term goal of completing my degree in business management. And now, I'm excited to explore new career paths in coding and programming with the support of Clusive.

Abstract: Discusses the problems in dealing with blindness and short-term memory loss During college and in employment.