

DIGITAL SEED GRANT WINNERS AND FINAL PROJECTS 2022-2023

ABOUT

Walker Library *Digital Scholarship Initiatives* supports individual and collaborative digital projects in research, teaching, and public outreach from any discipline on campus. The Digital Seed Grant is an annual award for start-up funds, developed to encourage and create opportunities for faculty, staff, and graduate students to use digital technologies in their research, service, or teaching.

The Digital Seed Grant (dsi.mtsu.edu/dsgrant) had impressive applications for its sixth year. The Digital Seed Grant Review Committee and Library Dean decided to award four grants for the 2022-2023 academic year.

The AY 22-23 awardees were announced on the website at <https://dsi.mtsu.edu/dsgrant22-23>. Below is a summary of the **four winning projects** and resulting outcomes.

Intercultural Engagement in Short-Term Faculty-Led Study Abroad Programs Across Disciplines

Primary Investigator (PI): Dr. Priya Ananth, MTSU Department of World Languages, Literatures, and Cultures

PI's Project Description: The Digital Seed Grant was used to fund the copyediting, print book purchases, and student worker support for producing an open access book titled *Intercultural Engagement Through Short-Term Faculty-Led Study Abroad: A Practitioner's Guide with Multidisciplinary Perspectives from a Public University*. The monograph is edited by Priya Ananth and Seok Jeng Jane Lim, aided by 15 contributing chapter authors, and published by [MT Open Press](#).

The main objective of this edited volume is to offer pedagogically sound and creative ways of integrating elements of intercultural competence into class activities, tasks, and assignments in short-term faculty-led study abroad programs. The intercultural competencies, categorized in the areas of knowledge, skills, and attitudes, include characteristics such as awareness about self and other cultures, creative thinking, problem-solving, empathy, tolerance towards ambiguity, and withholding judgment, to name a few. By purposefully embedding these characteristics in their course activities, faculty leaders can better assist their students in deepening intercultural and global competencies. This book will contribute uniquely to the field by providing theoretically driven model courses from a broad spectrum of disciplines at the university level.

Purpose and Audience: The main purpose of this book is to encourage the creation of new short-term, faculty-led study abroad programs at the university level as well as empower current faculty leaders to strengthen or adapt their programs. Since the book is formatted as a practitioner's guide, it will be of interest to a broad readership of multidisciplinary study abroad educators, including faculty leaders, faculty leaders-in-training, faculty scholars, and administrators.

Recently published online in September 2023, the book is already being used in at least two projects this fall semester. First, the chapters in this book will be used as recommended readings in a study abroad focused faculty learning community (FLC) on creating a community of short-term study abroad faculty leaders across disciplines at MTSU who are interested in enhancing intercultural engagement in their programs. Second, we will organize our 1st Study Abroad Symposium at MTSU during International Education Week on November 18, 2023. This symposium will involve talks and panel discussions with contributing authors of this book who will not only discuss the contents of their individual programs but also propel the conversations forward to cover issues such as assessments and advocacy that were not within the scope of this book.

Although this publication presents content and perspectives mainly from MTSU faculty leaders, we plan to use it as a launching pad to reach out to study abroad leaders outside of MTSU as well. For example, we intend to invite participants for the annual symposium from around Tennessee and beyond. This will help us assimilate expertise and promote discussions from a wider spectrum of program types and disciplines. Also, for the same reason, we would like to present the material from this publication at various conference venues both locally and nationally to network with colleagues from outside of MTSU.

Project News:

The book is available as open access (free) and as print-on-demand at <https://doi.org/10.56638/mtopb00223>. Published under the *MT Open Press Lightning Series* imprint, this book underwent developmental editing, copyediting, external review, and is indexed in WorldCat, DOAB, search engines, and the library catalog. Check out the [news release](#) for more details.



MATLAB/Simulink Simulations for an Autonomous Vehicle Sensors Testbed

Primary Investigator (PI): Dr. Jorge Vargas, MTSU Department of Engineering Technology

PI's Project Description: Autonomous Vehicle (AV) technology has the potential to provide enormous value to society. To do that, there is a need to build comprehensive testing technology to prove efficacy under different environmental conditions (e.g., rain). This can be done by creating simulations to validate perception and decision-making stages of AVs, thus demonstrating the response of radar systems in AVs. The simulated framework involves radars, target objects, and a stationary vehicle at specific environmental conditions through a real simulation system and MATLAB/Simulink.

The Digital Seed Grant was used to pay student workers, who collected data through a real simulation system and MATLAB/Simulink software in the MTSU Micro-Electronics Lab. They also attempted to create a user interface to work with real-world data and perceive PCs. Outcomes of the data collection enabled the drafting and submission of an article for publication in an open access journal.

This paper proposes a novel automotive radar waveform involving the theory behind 1 M-ary Frequency Shift Key (MFSK) radar systems. Along with the MFSK theory, coding schemes will be studied to provide a solution to mutual interference. The proposed MFSK waveform consists of frequency increments throughout the range of 76 GHz to 81 GHz with a step value of 1 GHz. Instead of stepping with a fixed frequency, a triangular chirp sequence allows for static and moving objects to be detected. Therefore, automotive radars will improve Doppler estimation and the simultaneous range of various targets. In this paper, a binary coding scheme and a combined-transform coding scheme used for radar waveform correlation will be evaluated to provide unique signals. AVs will have to perform in an environment with a high number of signals being sent through the automotive radar frequency band. Efficient coding methods are required to increase the number of signals that are generated. An evaluation method and experimental data of modulated frequencies as well as a comparison with other frequency method systems are presented.

Purpose and Audience: This project helps solve a real-world problem, therefore having potential impact on the public. Implementation of the proposed waveform has been coded and functional. Real world implementation of this waveform may require a unique antenna array, most likely using MIMO technology to maintain low hardware cost. Simulations of the waveform are performed on MATLAB. The proposed waveform will be programmed to generate radar data based on the beat frequencies created previously. The proposed coding scheme has the ability for future potential by increasing the number of slopes or steps. The incorporation of MIMO technology may be a viable step for creating more signals. With that, ghost detections may be canceled using virtual antenna arrays. As technology evolves, AVs will encounter a decentralized tracking network in which detections will be shared amongst vehicles.

Project News: The article was published by MDPI on August 15, 2023.

Duke, Jonathan, Eli Neville, and Jorge Vargas. 2023. "A Modulated Approach for Improving MFSK RADARS to Resolve Mutual Interference on Autonomous Vehicles (AVs)" *Sensors* 23, no. 16: 7192.

<https://doi.org/10.3390/s23167192>

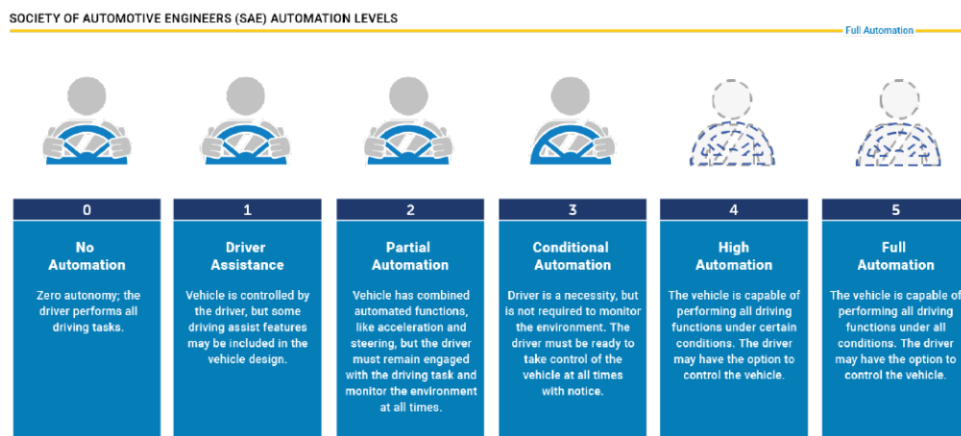


Figure 1 Society of Automotive Engineers automation levels. Reprinted from Duke et al. (2023) <https://doi.org/10.3390/s23167192>

Database of American Synagogue Iconography (DASI)

Primary Investigator (PI): Dr. Laura Cochrane, MTSU Department of Art & Design

PI's Project Description: The Database of American Synagogue Iconography (DASI) is an index of decorative imagery and motifs in American synagogues built prior to 1930. My goal for this project was to have a searchable, public website on decorative imagery of American synagogues that would make images and documentation openly available for research purposes. The ability to compile and compare images from different buildings made at different times and/or in different places will allow researchers to see patterns and make connections that they might otherwise not have. The decorations of synagogues were very political and ideological—synagogue decoration could be controversial, with figural imagery often being avoided because it was thought to be forbidden. At times in American history, however, figural and narrative imagery in synagogues was used to help modernize and assimilate Judaism. Understanding the mindset behind decorative choices can help to reveal the ideology of the designers and of the congregation.

The grant was used for travel reimbursements to visit and document synagogues in Texas, South Carolina, Mississippi, New Jersey, California, and Louisiana. While I first imagined this database as a means of conducting my own research, I now see this database as more important as a public good. It will help researchers to make connections and to see patterns that would otherwise be hard to discern. But, more importantly, it will preserve documents of these artworks and visual materials at a time when they are especially vulnerable.

Synagogues throughout the United States (like many Christian churches) are closing or relocating in record numbers, often leaving behind their historic buildings. Some are repurposed and, if they are designated as historic landmarks, the building may be preserved. But the interior decoration is not necessarily protected and if the building is reused by a different congregation, may not suit their needs. Such buildings, and especially the artworks they contain, are being demolished, and the art they held is destroyed or lost. As few have been sufficiently documented, there will often not be a record of what they looked like. This database would serve the purpose of posterity documentation for the synagogue decoration of the nineteenth and early twentieth centuries. So far, what I learned was that there is an enormous amount of diversity among these buildings. However, I am excited to see how the database will reveal patterns and trends that may not be immediately evident when treating each synagogue separately.

Purpose and Audience: DASI is a visual database of decorative imagery and motifs in American Synagogues, mainly in the American Southeast. The database records historical information about the building and the decoration of the synagogue and identifies the iconography of stained-glass windows, wall paintings, and furnishings. The purpose is to be able to search within the database to see patterns and trends in synagogue decoration. These artworks are being demolished or scattered and, up until now, they have not been sufficiently documented. This database will be open to the public and for posterity, records the synagogue decorations of the nineteenth and early twentieth centuries.

Project News:

The DASI collection is available at <https://digital.mtsu.edu/digital/collection/dasi>. The collection will continue to grow through spring 2024.



Figure 2: Temple Emanuel in Beaumont, Texas, interior, torah ark lining, detail.

<https://digital.mtsu.edu/digital/collection/dasi/id/9/rec/33>

The African American Material Culture of Death in Middle Tennessee

Primary Investigator (PI): Dr. Stacey Graham, MTSU Center for Historic Preservation

PI's Project Description: Nashville and the surrounding counties are currently among the fastest-growing areas in the U.S. Both rampant development into formerly rural areas and gentrification of longstanding urban neighborhoods have put undue pressure on vulnerable properties such as small cemeteries and older housing stock, with the impact disproportionately felt among African American residents and business owners. Furthermore, city cemeteries have reflected a systemic segregation by denying African American families access and visibility. The African American history of Nashville and Middle Tennessee is a vital part of the fabric of the history, accomplishments, and character of Tennessee. Our project is located at the convergence of these pressing preservation concerns – properties associated with the human disposition and commemoration of the deceased, particularly those that are fast disappearing in the glossy sprawl of metropolitan Middle Tennessee. Our project seeks to draw attention to marginalized death traditions and culture in African American communities with a specific focus on cemeteries, churches, funeral homes, and other sites associated with death practices, particularly in Nashville and the fast-growing counties of Middle Tennessee.

The Digital Seed Grant enabled the equipment loan of a laptop and document scanner, plus hosting the digital collection in the library's CONTENTdm database. This digital exhibit is intended to be a tool that can be used piecemeal or in its entirety in the classroom, in community heritage meetings and events, as a linked and related resource for other public history projects, and in scholarly footnotes and bibliographies.

Purpose and Audience: As intended, this exhibit starts off very small – a collection of nine artifacts or sites, with brief essays providing historical context for each item. We hope to add to it over the coming years, based on further research and from feedback from other researchers, preservationists, archivists, and interested community members. We attempted to create a story, told in different aspects as represented by the various items, that describes how African Americans in Middle Tennessee have developed death-related cultural traditions in response to the legacy of slavery, the limitations placed upon them by Jim Crow laws, and the

unique cultural expressions forged by communities made tight-knit by adversity. This is why we concentrate on the period of U.S. history beginning in Reconstruction and with a strong focus on the Jim Crow period stretching from the late 19th to the early 20th century. However, we also wanted to bring the timeline into the present by examining the preservation of this material culture and how the pressures of economic and demographic growth in the Middle Tennessee area have put undue pressure on African American neighborhoods and historic sites.

We hope this will be of interest and of use to students, scholars, and community members working to research and preserve artifacts and sites that represent deathways culture. There has been much increased attention to the contributions of African Americans to the fabric of our historic landscapes in Middle Tennessee, and this project seeks to fit into that larger effort of awareness. Some of the nine items initially made available through this collection are primary sources that are not publicly accessible anywhere else online. Others are included in other digital collections or public spaces. All are brought together for the first time under the theme of the African American material culture of death in Middle Tennessee, which contributes to public history scholarship and outreach in three ways. First, it provides thematic primary sources to bolster further research into this topic. Second, it provides contextual essays that can be used as secondary sources for students, educators, and researchers learning about this topic and related fields. Third, it recognizes local efforts of African American communities and other organizations to preserve these artifacts and sites and bring attention to these stories and their legacies.

The MTSU Center for Historic Preservation (CHP) has worked with numerous African American communities to preserve those physical traces in their neighborhoods that they were able to develop on their own, outside of traditionally white power structures. This means we've worked with hundreds of cemeteries, schools, and churches over the past forty years, as well as other structures such as houses, funeral homes, businesses, and districts. The grant investigators have carried over the CHP's community-based approach to historical topics to this digital exhibit. Finally, by emphasizing artifacts that represent traditions surrounding death practices, we hope to contribute to a larger conversation about how we commemorate the dead and deal with dead bodies on a practical level—so this is for “death positivity” as much as historic preservation.

Project News:

The African American Material Culture of Death in Middle Tennessee (AAMCD) collection is available at <https://digital.mtsu.edu/digital/collection/aamcd>

OBJECT – EPHEMERA:

Church Fan with Funeral Home Advertisement



This paper fan represents a ubiquitous form of religious ephemera. Unlike a tombstone that is meant to stand forever, the fan is only meant to be used for the duration of a church service, after which it might be reused or, more commonly, thrown away. This particular fan from the collections at Tennessee State Museum relates to death culture in two ways: first, it advertises a local funeral home on the reverse side, and second, it may as easily have been used during

Figure 3: Object-Ephemera essay on the church fan with funeral home advertisement

FUNDING AND SUPPORT

The Digital Seed Grant is made possible by generous funding and support from the Library Dean and the Digital Scholarship Initiatives team. For many, this is a starter grant, which can lead to national grant opportunities in the future and Walker Library wants to encourage and support such creativity activity.

As a competitive grant, evaluation of applications and assessment of digital lifecycles of selected projects takes time. The Digital Seed Grant is indebted to the time of the Review Committee and colleagues at Walker Library who support operational aspects. Thanks also go to those who help promote the grant and encourage participation. The grant program was initially launched in 2016 for the award period of 2017-2018. Since 2017, the library has jumped-started campus research by funding 15 digital seed grant projects across various academic disciplines.

The 2023-2024 cycle is on pause. Information on future cycles will be available at <https://dsi.mtsu.edu/dsgrant>.