



NATIONAL ENDOWMENT FOR THE HUMANITIES

OFFICE OF DIGITAL HUMANITIES

Narrative Section of a Successful Application

The attached document contains the grant narrative and selected portions of a previously funded grant application. It is not intended to serve as a model, but to give you a sense of how a successful application may be crafted. Every successful application is different, and each applicant is urged to prepare a proposal that reflects its unique project and aspirations. Program guidelines also change and the samples may not match exactly what is now required. Please use the current set of application instructions to prepare your application.

Prospective applicants should consult the current Office of Digital Humanities program application guidelines at <https://www.neh.gov/grants/odh/digitalhumanities-advancement-grants> for instructions.

Applicants are also strongly encouraged to consult with the NEH Office of Digital Humanities staff well before a grant deadline.

Note: The attachment only contains the grant narrative and selected portions, not the entire funded application. In addition, certain portions may have been redacted to protect the privacy interests of an individual and/or to protect confidential commercial and financial information and/or to protect copyrighted materials.

Project Title: Building and disseminating an app for ethnographic remote recording

Institution: Michigan State University

Project Director: Betsy Sneller

Grant Program: Digital Humanities Advancement Grants, Level II

Participants

PI: Dr. Betsy Sneller, Michigan State University

Advisory Team:

Michigan State Internal

Dr. Scott Schopieray, Michigan State University

Dr. Suzanne Wagner, Michigan State University

Dr. Laura Yares, Michigan State University

Michigan State External

Dr. Anthony Pratcher II, Arizona State University

Technical Team:

Mr. Russell Werner, Michigan State University

Mr. Daniel Trego, Michigan State University

Building and disseminating an app for ethnographic remote recording

Introduction and Project Goals

Covid-19 upended research programs that relied on face-to-face interaction with participants, across disciplinary boundaries. Researchers have had to pivot to digital methods of data collection on short notice. This disruption to conventional in-person research was a catalyst for the Michigan Diaries project, a sociolinguistic research project at Michigan State University (MSU), to develop a mobile app that can capture high quality self-recorded audio. The app was subsequently successfully adapted by another research project in Religious Studies at MSU (Shtisel Diary). We seek Level II funds to 1) redevelop our the front end and refactor the back end of our app infrastructure, so that it is clean, modular, and easily implementable by non-MSU researchers, 2) beta test the installation and use of the new app with an interdisciplinary user community of external researchers in the humanities, and 3) publish the code and user guide in a public GitLab repository for wider dissemination.

Enhancing the Humanities

As smartphones and tablets have become more ubiquitous, with 85% of U.S. adults owning at least one (Pew, 2021), they have also emerged as an important tool in digital humanities research. Upgrades to native audio file formats and phone cameras in recent years have meant that smartphones can obtain high quality audio, video, and image data. Apps for smartphones have been integrated into a variety of humanities projects, from developing a new app for interactive dance performances (e.g., the Smartphone Project; Oppermann et al., 2015) to utilizing existing apps like StoryCorps for classroom pedagogy (e.g., Auberry & Neely-Sardon, 2019). However, the barrier to developing a native smartphone app remains relatively high for many humanities researchers, who may not have the technical skills themselves or access to app developers within their home institutions to bring a recording app to fruition.

The proposed project will make the simple app prototype developed by the Michigan Diaries (MI Diaries) accessible to a wider range of researchers, by redeveloping the code into a clean and modular format so that it can be shared publicly and used by researchers outside MSU. Remote self-recording presents an opportunity for humanities researchers to expand research methodology and provides the following particular benefits:

Longitudinal data collection: A native app for self-recording via a smartphone promises significant benefits for longitudinal research. Apps have a relatively low barrier of access compared to setting up in-person or even virtual meetings with researchers. Self-recording has the additional benefit of mitigating any potential influence from the presence of a researcher. This is important for longitudinal research, since the influence of an in-person researcher is likely to change over time as researchers and participants become more familiar with each other over the course of a longitudinal project (Wagner & Tagliamonte, 2018).

Gamification: For research projects that benefit from regular or long-duration recording data, gamification is an important tool to encourage desired data from participants. The current prototype phase of the MI Diaries app includes a progress bar to encourage participants to submit a minimum threshold of recording time, and planned updates currently include adding weekly goal streaks and user badges to promote regular participation. During the pre-design phase of the proposed project, the Advisory Team will work with the Technical Team to design a wide range of modular gamification features that may encourage a range of desired data types from participants.

High quality, long duration recordings: Making use of iOS and Android's native lossless audio recording formats means that smartphone apps are able to obtain sufficient quality recordings to enable robust acoustic measurements. Furthermore, using a native app rather than a web app allows for long duration recordings: buffering time for web apps limits recordings to around 5 minutes in length; the current prototype regularly obtains recordings over an hour in length with no problem. For ethnographic research or research that

requires naturalistic or conversational speech, it is particularly beneficial to have no upper bound on the time limit of a recording. The prototype can also integrate prompts into the recording screen, allowing researchers to focus participants' self-recordings on specific topics.

High quality photo and video: Similarly, making use of iOS and Android's native high-quality camera allows researchers to obtain video and photo data easily. Our current app enables photo uploads; future updates are planned to expand this to video as well.

Data and participant management system: While the simple front end enables easy use by participants, the back end of the app provides robust data management and storage on a secure university server, as well as participant management tools. Project personnel have their own login credentials; this enables PIs to set different levels of access to data for admin and research assistants (RAs). RAs can tag and sort incoming files for various features relevant to the project. Built-in reporting tools assist with participant tracking and payment. Finally, participants sign up through the app, meaning that identifiable metadata like participant names and contact information can be stored securely and may be kept separate from data files like audio recordings and photo uploads.

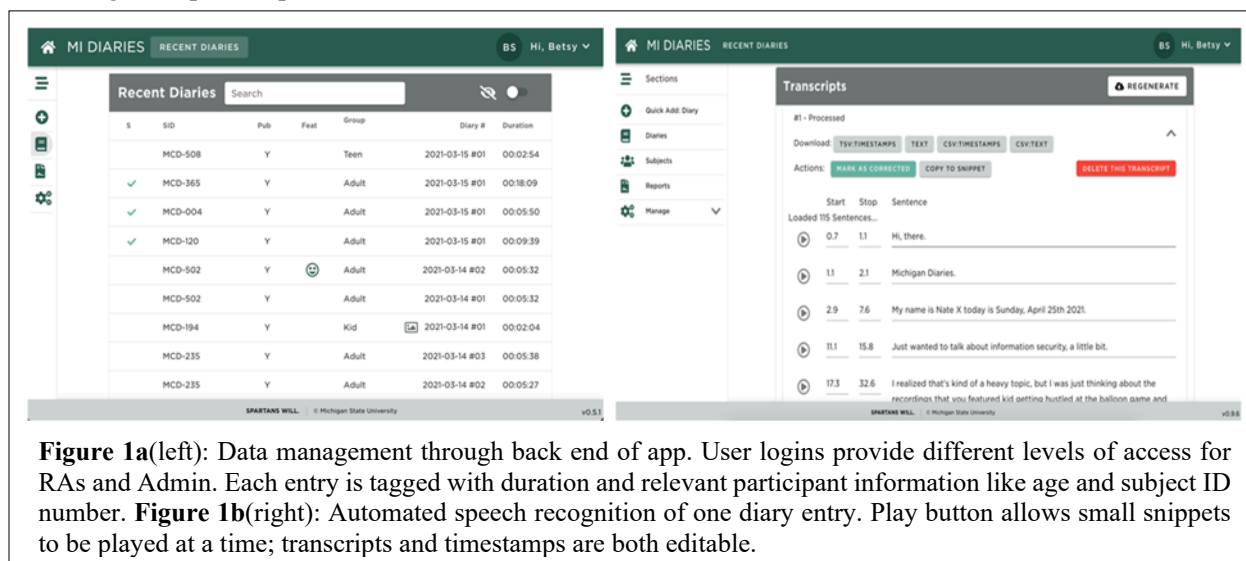


Figure 1a(left): Data management through back end of app. User logins provide different levels of access for RAs and Admin. Each entry is tagged with duration and relevant participant information like age and subject ID number. **Figure 1b(right):** Automated speech recognition of one diary entry. Play button allows small snippets to be played at a time; transcripts and timestamps are both editable.

Time-aligned Automated Speech Recognition and in-browser transcription editing: The back end of the app is currently integrated with Google Automated Speech Recognition (ASR), which produces relatively accurate transcriptions of speech files in almost real-time (typically within 5-10 minutes of submission for a 60 minute audio diary). Google ASR substantially lowers the cost of producing an accurate, time-aligned transcript, from around \$2.50 per minute of speech for manual transcription to around \$0.37 per minute of speech for a combination of Google ASR and some necessary hand-correction by RAs. ASR has been a critical aspect of MI Diaries research in particular, as the project is designed to respond in real time to participant entries; being able to visually scan incoming entries without needing to listen through a full recording helps immensely. The resulting transcripts are time-aligned to the audio file.

Environmental Scan and History of the Project

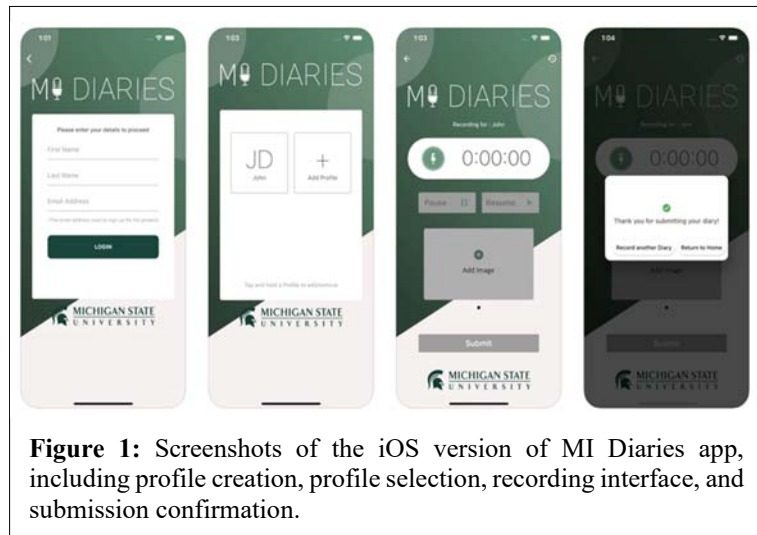
MI Diaries

The Michigan Diaries (MI Diaries) project was developed rapidly in response to the emerging Covid-19 pandemic, during late March of 2020. It is a sociolinguistic project aimed at tracking changes to participants' social lives and language over the course of the pandemic and beyond, as participants return

to in-person activities. Over the past few decades, the variety of English spoken in Michigan has been undergoing some rapid changes in pronunciation (Wagner et al., 2016; Nesbitt et al., 2019); this type of large-scale language change is normally driven by face-to-face interaction with a wide range of weak social tie interlocutors (Labov, 2001; Milroy, 1980). The widespread social distancing measures imposed during Covid therefore had the potential to arrest ongoing language change in a way that linguists have not been able to capture in real time before.

To investigate whether social distancing has an impact on ongoing language change, we needed a way to obtain high quality, long duration audio recordings that would be sufficient for acoustic analysis. Ideally, we would also keep participants of all ages engaged in the project throughout its duration. Recent work in linguistics has found that lossless recording formats from standard smartphones (iOS, Android) produce sufficient audio quality to reliably obtain vowel measurements (Sanker et al., *in press*, Zhang et al., 2021). Obtaining audio recordings of sufficient length raised a separate problem. While web apps have been used to obtain short audio samples (e.g., Leeman, 2016a; Leeman et al., 2018a), the practical limitation of online buffering meant that we would be limited to recordings of around 5 minutes maximum. For the type of ethnographic and large-scale measurement analysis we intend to do with our data, this did not suffice. However, currently existing native iOS and Android apps for linguistic data collection (e.g., Kolly & Leeman, 2015; Leeman et al., 2021) do not make their code publicly available for adaptation.

Our solution was to build our own simple native app for iOS and Android, which participants could use to directly record and upload weekly “audio diaries” (Figure 1). Participants can create distinct user profiles on a single device, which allows parents to sign up multiple children on one device. Recordings make use of the native lossless file formats from iOS and end of the app includes a custom interface for data and participant management. Since September of 2020, end of the app includes a custom interface for data and participant management. Since September of 2020, 379 unique diarists have submitted 928 total diary entries, adding up to 11,774 minutes of audio diary data. Recruitment and data collection are ongoing.



Although the app was developed as a way to collect casual, conversational-style speech data remotely during Covid-19, it quickly became apparent that the app provides a number of additional benefits. Obtaining self-recordings widens our participation pool dramatically, both geographically and numerically, since a researcher does not need to be physically present for data collection. Self-recordings also present a major benefit for longitudinal research, as highlighted above. Finally, incorporating the app into our research program has enabled MI Diaries to more easily develop partnerships with community organizations: in February 2020 we partnered with a youth photovoice project run through 4-H (“Visualizing a Year Like No Other”), which used our app to support the photovoice process. We’ve also developed a partnership with the Library of Michigan, which will host anonymized diary entries and transcripts in their digital media archive under a Creative Commons license for public access. The app has the potential to support additional humanities researchers in forging similar outreach connections with communities and institutions, by widening access to recording technologies and allowing for relatively easy creation of oral history and visual archive data.

Shtisel Diary

MI Diaries presented their app as part of a “Pivoting your research during Covid-19” symposium to an interdisciplinary group of researchers at MSU in early Fall of 2020. Laura Yares, Assistant Professor of Religious Studies, participated in the symposium and saw an opportunity to utilize the technology for her own research project on religious learning through engagement with cultural arts. As a Religious Studies project based in ethnographic fieldwork methods, data collection for the project had been anticipated to focused on in-person interviews, observations, and site visits to film festivals, museums, and concerts. With the onset of Covid-19, all anticipated fieldwork was necessarily cancelled, and the project pivoted to collecting data on participant learning from television as a cultural arts medium. The audio diary technology piloted by MI Diaries offered a flexible and asynchronous tool for capturing viewer reactions to television shows as viewers watched in their own homes. The project focuses on a television show produced in Israel, *Shtisel*, filmed in Yiddish and Hebrew, and accessible in the United States through the Netflix streaming service. The app was customized for the Shtisel Diary project, adding a background image of Jerusalem stone and the Hebrew name for the show, immediately recognizable to viewers (Figure 3). New features added for the Shtisel Diary project included a box for prompt questions integrated into the recording screen, and a direct sign-up through the app to streamline the user experience.

The Shtisel Diary project utilizes the app as part of a mixed methods approach to ethnographic data collection. A popular Facebook Group, “Shtisel - Let’s Talk About It) serves as the foundational fieldwork site for the project. Data collection includes analysis of posts contributed by members, a survey of the group conducted in January 2021, and interviews with group founders and active contributors. Participants in the Shtisel Dairy app project were recruited from the group ahead of the release of the third and final season of *Shtisel* to Netflix in March 2021. In the first week of the new series, over 300 audio diary entries were contributed to the app from participants across the world. To date, for only the current third season, 87 unique diarists have submitted 585 total diary entries using the app, adding up to 1556 minutes of audio diary.

The mixed methods approach deployed in this study, combining audio diaries submitted to the Shtisel Diary app with an analysis of social media posts and interviews, has a range of affordances for ethnographic research into cultures and communities broadly, and the way that viewers learn about religious groups through participation in cultural arts media more specifically. Utilizing the app in conjunction with social media analysis of a Facebook group allows for direct comparison between a participant’s social media postings and first-person narrative responses to similar questions and issues. Methodologically, the app helps to reduce researcher bias: when participants submit a stream of conscious narrative, they are considerably less likely to be shaped by the physical presence of a researcher in comparison to one-on-one interviews or focus groups. Finally, the app allows for asynchronous data collection. This is critical for a study that aims to understand the impact of leisure activities such as television viewing in real time.

Connections and limitations

In presenting various parts of our research over the past year, the app infrastructure for “diary” type, high-quality recordings has received a substantial amount of interest from an interdisciplinary set of scholars (including Linguistics, Digital Humanities, Religious Studies, TESOL, Education, and Theatre), who have identified this kind of app as a potentially useful tool for their own research (Sneller et al., 2021; Yares &



Figure 3: Shtisel Diary app homescreen. The larger project, Jewish Learning through Cultural Arts, is sponsored by Brandeis University’s Mandel Center for Studies in Jewish Education.

Sneller, 2021). The primary limitation in sharing our current app is that it has been built specifically within Michigan State's existing technological infrastructure, and was developed rapidly in a piecemeal fashion, as research teams requested specific ad hoc features. As a result, the code underlying the user interface and the back-end server is neither clean nor readily understood, edited, or implemented outside of MSU. Additionally, the user interface was written in Flutter rather than natively in Swift (for iOS) and Java (for Android). Flutter is a software development kit that allows code to be exported to Swift and Java without modification, but imposes limitations on advanced features that can limit the look and feel of the app.

In this proposal, we aim to redevelop the code used for the front end of the app and refactor what has been developed for the back end, so that it can be shared in an open-source venue. We will beta test the installation and use with an Advisory Team that includes 3-5 researchers in the humanities that are external to MSU, enabling us to troubleshoot its implementation and obtain suggestions for design features that may make the app more widely valuable for digital humanities research across disciplines.

Activities and Project Team

Dr. Betsy Sneller is the grant's principal investigator, and will be responsible for coordinating and managing the project.

The Technical Team is led by Russ Werner, who is a Solutions Engineer in IT at Michigan State. Werner has overseen the development of the front end of the app for the current prototype version of the app and has built the back end (written in Java). He will be supported by Daniel Trego, an Educational Media Design Specialist who leads the iOS Design Lab course at MSU and mentors students in app design and experience architecture. One graduate student and one undergraduate student with coding abilities in Swift and Java and an interest in app design will join the Technical Team.

The advisory team is led by Sneller (MI Diaries PI) and Dr. Scott Schopieray. Schopieray is an Associate Director of the MESH Research, an intercollegiate center focused on digital scholarly work. Dr. Suzanne Wagner (MI Diaries co-PI), and Dr. Laura Yares (Shtisel Diary PI) will serve as MSU-internal Advisory Team members. Dr. Anthony Pratcher (Arizona State University) will serve as the first external Advisory Team member. Pratcher's research in History, focusing on the way that urban policies influence minoritized community formation in the metropolitan Southwest, provides an important new perspective on how the app may be utilized. Pratcher will be joined by 4 additional external researchers who will be recruited during Phase 1. The Advisory Team will be responsible for providing regular feedback during the design and implementation phases of Year 1, and coordinating the user community in Year 2.

Year 1: Develop an initial fully open-source version of the app

The first year of the project will be focused on developing the beginning of a user community for the app infrastructure, and using this community to help develop an open-source version of the app, server, and back end interface. Year 1 is separated into three phases (see the Work Plan for a more detailed description). In **Phase 1** (expected: 2 months), Schopieray and Sneller will recruit and select four additional external research teams to join the Advisory Team, with special effort made to obtain a diverse range of research fields within the humanities, as well as researchers from different types of institutions (e.g., R1, SLACs, etc.) In **Phase 2** (expected: 5 months), the Technical Team will meet regularly with the Advisory Team to pre-design the app, specifying the desired general capabilities as well as specific modular components of the front end of the app. By June 15, the Technical Team will present a full wireframe for final approval. The Technical Team will then design and implement the new app, including optional modular elements such as an online interface for participants and gamification elements such as a progress bar, goal streaks, and badges. Phase 2 will end with a fully operational form of both the front and back end of the app. **Phase 3** (expected: 4 months) will begin with a half-day workshop, guiding the Advisory Team in setting up the

app at their home institutions. Throughout Phase 3, the Advisory Team will beta test the app, and provide feedback for iterative development. At the close of Phase 3, Werner will publish the polished code to a public repository through MSU's GitLab. With the Technical Team, Sneller will additionally create a user manual, with detailed instructions for the installation and use of each optional component of the app. This will be modeled on the successful wiki for installing and using FAVE (a relatively complex program standardly used in sociolinguistic research, which requires nontrivial installation dependencies and whose installation and use is relatively complicated: <https://github.com/JoFrhwld/FAVE/wiki>). The guide will include a contact form for questions and troubleshooting, which will be managed by Sneller and Werner.

Funds are also requested for Sneller and Werner to attend the one-day meeting at NEH in April 2022.

Year 2: Expand to humanities projects external to MSU

In the second year (**Phase 4**) of the project, we aim to expand the user community beyond the Advisory Team. Upon publishing the code and user guide in a public GitLab repository, we will begin widely advertising it, beginning with the interdisciplinary digital humanities networks identified by Schopieray in Phase 1. The Technical Team will be available to help troubleshoot any incoming inquiries. During Phase 4, the Advisory Team will focus on creating a community of practice around the app infrastructure to help support long term sustainability. We anticipate that because the code will be publicly available on GitLab, some members of the user community may push their own updates and improvements to the code.

The community that we expect to grow out of the beta testing program and the open-source contributors will foster a more distributed network of contributors and will encourage a community driven approach to the work. To support this goal, we will begin to form a wider community of practice around the use of the app. As our beta testing period comes to a close during Year 2, we will work with members of the Advisory Team and additional external users of the app to create a sustainability committee to make decisions and find commitments for future investment in the sustainability of the project beyond the period of funding (see Sustainability Plan for more details).

Final Products and Dissemination

The primary product to be disseminated will be our app code and use guide. We anticipate disseminating this in two ways. First, we will publish our app code on MSU's GitLab (gitlab.msu.edu) in a publicly accessible repo, which will also open the door for future pull requests from other users. This will be published alongside a robust user guide, which will include instructions for installation and maintenance. Updates to the code and its installation and use – including any major updates as required by software upgrades – will be committed to the GitLab repository and the wiki in real time by the technical team during the period of funding. MI Diaries is expected to continue using the app for data collection for at least the next five years; any major updates required after the period of funding will be implemented by the MI Diaries project and updated on GitHub by Sneller.

The user guide will be aimed at an audience with basic coding familiarity; we anticipate that humanities researchers without this familiarity will be able to work with IT support at their home institution to use our code to build their app. One final consideration for long-term sustainability is the integration of Automated Speech Recognition (ASR) into the back end of the project; this will be built as a modular component so that research groups may choose their own ASR options (such as DeepSpeech or wav2vec2), or opt-out of ASR if they do not have a budget for it.

The second primary output will be a methods paper for the app and its interdisciplinary uses. We anticipate developing the paper during Year 2 of the project, and aim to submit it by the end of the second year of funding in an open-source interdisciplinary journal such as Digital Humanities Quarterly. This will include the code to-date as supplementary materials, as well as links to the long-term GitHub repository.

Work Plan

Phase 1: Advisory team development

January 2022 – March 15, 2022

During Phase 1, Sneller and Schopieray will work to identify a total of 5 external researchers and/or research teams to become a member of our advisory team during the development phase of the project and to beta test the application for their own work.

In order to ensure the greatest diversity of advisory team, we will be considering variables such as career stage, race, gender, technical skill, institution type, and discipline as we connect with and recruit possible advisory team members. Sneller and Schopieray will work with consortia such as the Big Ten Academic Alliance (BTAA), the Humanities Without Walls Consortium (HWW), and through our international network of scholars and research units that are connected to MSU's work in Digital Humanities and Digital Scholarly Publishing. Potential advisory team members will apply for consideration through a short survey following the successful model of the Manifold Digital Services Pilot Program. By March 15, the full Advisory Team will be selected, and added to the working group on Microsoft Teams. Throughout the entirety of the funding period (Phases 1-4), the Microsoft Teams working group will be the primary place for project updates, questions, conversations, files, and ideas. Sneller and Wagner have experience using Microsoft Teams to manage MI Diaries, which is a large project of over 30 members, with several subteams that include members external to MSU and which need to be coordinated as a whole.

Phase 2: Pre-design, design, and implementation

March 15 – August 15, 2022

During Phase 2, the Advisory Team will meet regularly (expected: once per month for the first three months) with the Technical Team (headed up by Werner and Trego, and including student developers) to pre-design the desired app. Trego will lead the student developers in implementing user-oriented design process to create a compelling user journey and accessible interface following successful design techniques used in the iOS Design Lab course. The Advisory Team will identify goals for app usage, and work with the Technical Team specify which components of the app should be modular and optional. By June 15, the Technical Team will present a wireframe proposal to the Advisory Team, for final approval. From June 15 – August 15, the Technical Team will work to implement the wireframe designs into a researcher-friendly simple app. By August 15, the code for implementing both the front and back ends of the app will be available to Advisory Team.

Phase 3: Beta testing and adjustments

August 15 – December 31, 2022

Phase 3 will kick off with a half-day workshop (led by Schopieray, Werner, and Sneller), guiding external team members through setting up the app and server at their own institutions. This workshop will 1) set the Advisory Team members up for beta testing the app as well as 2) provide a rough draft for the user manual (to be published by December 31, 2022). Advisory Team members will begin beta testing the app for their own research purposes beginning in August, 2022. We anticipate that app features will continue to be designed and implemented throughout the duration of the beta testing period. The Advisory Team will meet once per month from September to November to identify areas of improvement, both in the app itself and in the user documentation.

Sneller will work with Werner and the student members of the technical team to develop the documentation and user guide. These will be published in a public repository on MSU's GitLab under an MIT license by December 31, 2022.

Phase 4: Wider dissemination

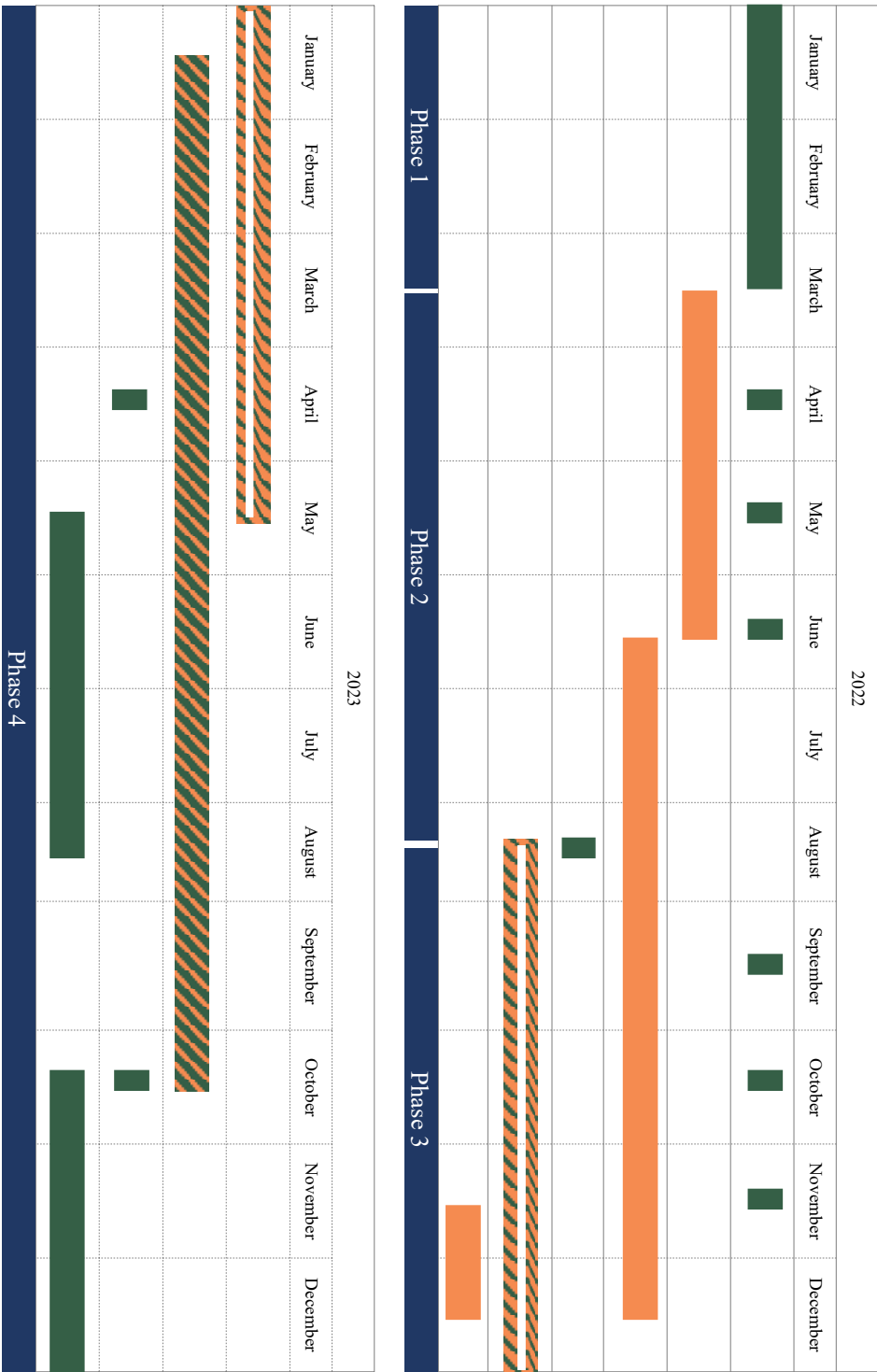
January 2023 – December 2023

In the final phase of the project, we aim to expand the user community of the app infrastructure. Sneller and Schopieray will head up a focus on long-term sustainability of the app infrastructure. Schopieray will advertise the publicly available code and documentation through existing consortia connections. We anticipate that the majority of Phase 4 will consist of troubleshooting incoming inquiries from new external researchers who have adopted the app infrastructure from the publicly available GitLab repository; Sneller and Werner will manage incoming troubleshooting requests and update the code and documentation accordingly throughout the year. The entire technical team will manage and implement any additional required updates. The Advisory Team will meet at least once per semester, to finalize code and documentation details. The focus throughout Phase 4 will be cleaning up the code and documentation as well as broadening the user community, to ensure the long-term sustainability of the final app infrastructure.

During this final phase, Sneller will work with any interested members of the Advisory Team and Technical Team to write and submit an interdisciplinary methods paper outlining how the app has been adapted by various projects. This will be submitted to an Open Access journal and will include the code and documentation to-date as an appendix as well as links to the permanent GitLab repository.



Work plan visualization for “Building and disseminating an app for ethnographic remote recording”



Data Management Plan

Roles and responsibilities

The PI (Sneller) and technical lead (Werner) will be responsible for implementing the Data Management Plan.

Expected data

The project will generate two primary types of data. The first is the working notes and community feedback that we will obtain from our beta testing of the app, and the second is the public-facing code and user manual.

1. Working Notes

Project notes, feedback, development plans, and preliminary code will be stored on an MSU-based Teams account (for notes and minutes) well as a private MSU GitLab repository (for code). These documents will be archived at the end of the funding period on a hard drive, which will be stored in the PI's office. We anticipate that working notes will not have much external value.

2. Code and User Manual

Code will be commented per industry standards, licensed under an MIT license, and will include a read.me file. This will be stored in a public repository on MSU's GitHub, which will allow both for permanent storage as well as potential future updates via community pull requests.

The user manual will be written by Sneller and the technical team during the first year of funding, and will be updated throughout the second year of funding, as troubleshooting requests come in. This will be published on MSU's GitLab, in the same repository as the code (expected: at the end of the first year of funding; December 2022).

Period of data retention

The code will be made public on MSU's GitLab under an MIT license beginning December 2022. It will be actively maintained and updated throughout the period of funding (through December 2023). The GitLab instance is owned by MSU IT, so will remain with MSU's GitLab for the foreseeable future. A backup copy of the finalized code and documentation will be made at the point of the code becoming public (December 2022), as well as at the end of the period of funding (December 2023), and stored on a hard drive which will be kept in the PI's office.

Data formats and dissemination

The code will be posted in December 2022 on a public GitLab repository under an MIT license, preserving the copyright and requiring license notices.

Data storage and preservation of access

During the period of funding, the working files will be stored in Michigan State Teams, so that it is backed up. Permissions will be set to allow all external advisory team members to access all files. For the first year of funding, the code will be stored on a private GitLab repository. It will be made public at the end of the first year of funding (December 2022). A backup copy of the code and documentation will be