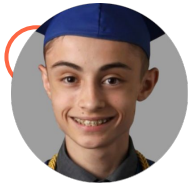
Diverse Makers



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About our Client

Dr. Jared Duval
Assistant Professor - SICCS NAU
Director of Playful Health Technology Lab

Experience in the Field

- Uses research through design to develop therapy games and playful applications that help improve and maintain health

Research Focus

- Specializes in serious games for health that emphasize human-computer interaction with assistive technology

Lack of STEM Accessibility

Current STEM Landscape

"Over 40 million Americans have a disability, however, research shows that disabled people are severely underrepresented in STEM fields. So much so that only 3% of people in the STEM workforce have a disability."

Potential Solution

- STEM learning opportunities are not equally accessible to those with disabilities
- Makerspaces offer hands-on STEM learning outside school

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Issues in STEM Accessibility

Limited Physical Access to Makerspaces

- Many makerspaces are not physically accessible to individuals with disabilities

Lack of Accessible Learning Resources

- Current STEM materials and maker project guides do not cater to diverse learning needs

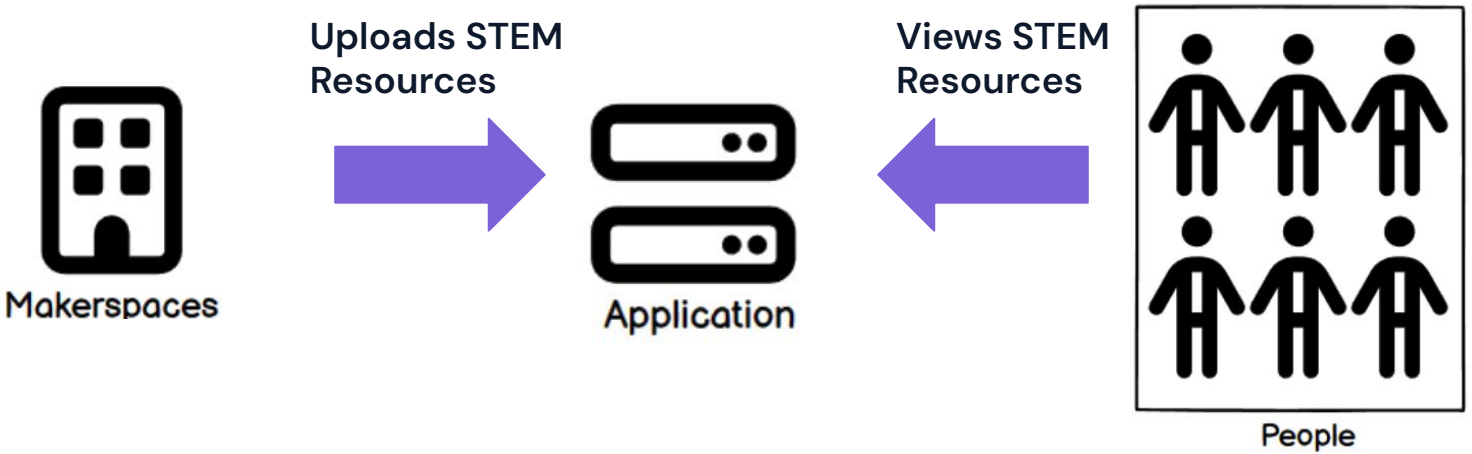
Social Isolation in STEM Fields

- Those with disabilities face social barriers leading to a lack of community

Making STEM More Accessible

Crowdsourced mobile application serves as a central hub for sharing STEM resources

- Provides STEM resource hosting and sharing for makerspaces
- Accessible interface and STEM content supporting multiple disabilities
- Allows users to discover and connect with local makerspaces with custom profiles



Requirements and Specifications

Functional Requirements

- Secure user authentication
- Resource hosting for STEM content
- Accessible UI for multiple disabilities
- Location-based makerspace discovery
- Search and filter system

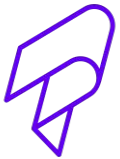
Performance Requirements

- Cross-platform compatibility
- Responsive layout and design
- Optimized data retrieval for STEM content
- Real-time updates and synchronization

Architecture and Implementation

System Architecture Components

- User Interface
  - Buttons, navigation, and accessibility options
- Business Logic
  - Data validation, organization, and rules
- Data Access
  - Data storage, modification, and retrieval



Implementation Details

Frontend: React Native

- Cross-platform consistency
- Accessible UI components with React Paper
- Material Design principles

Backend: Google Firebase

- User authentication services
- Real-time database for hosting
- Search and filter functionality

Prototype Demonstration

Scenario 1: Visual Impairment User

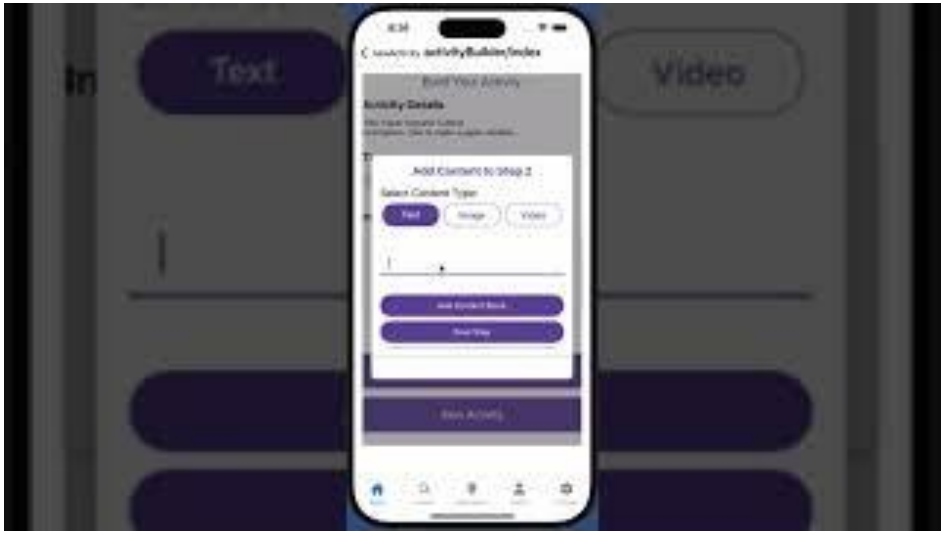
- Account creation and login
- High contrast mode
- Font size adjustment

Scenario 2: Content Creation

- STEM Resource creation and upload

Scenario 3: Community Connection

- Makerspace discovery
- Profile interaction



Challenges and Resolutions

Unintuitive system for Makerspaces

- Problem: Poor design of application could lead to low usage and contribution
- Resolution: Communication with client and stakeholders

Disability Negligence

- Problem: Unintended negligence of certain disabilities when accommodating for others
- Resolution: Follow proper design principles such as WCAG

Testing Plan

Testing Distribution

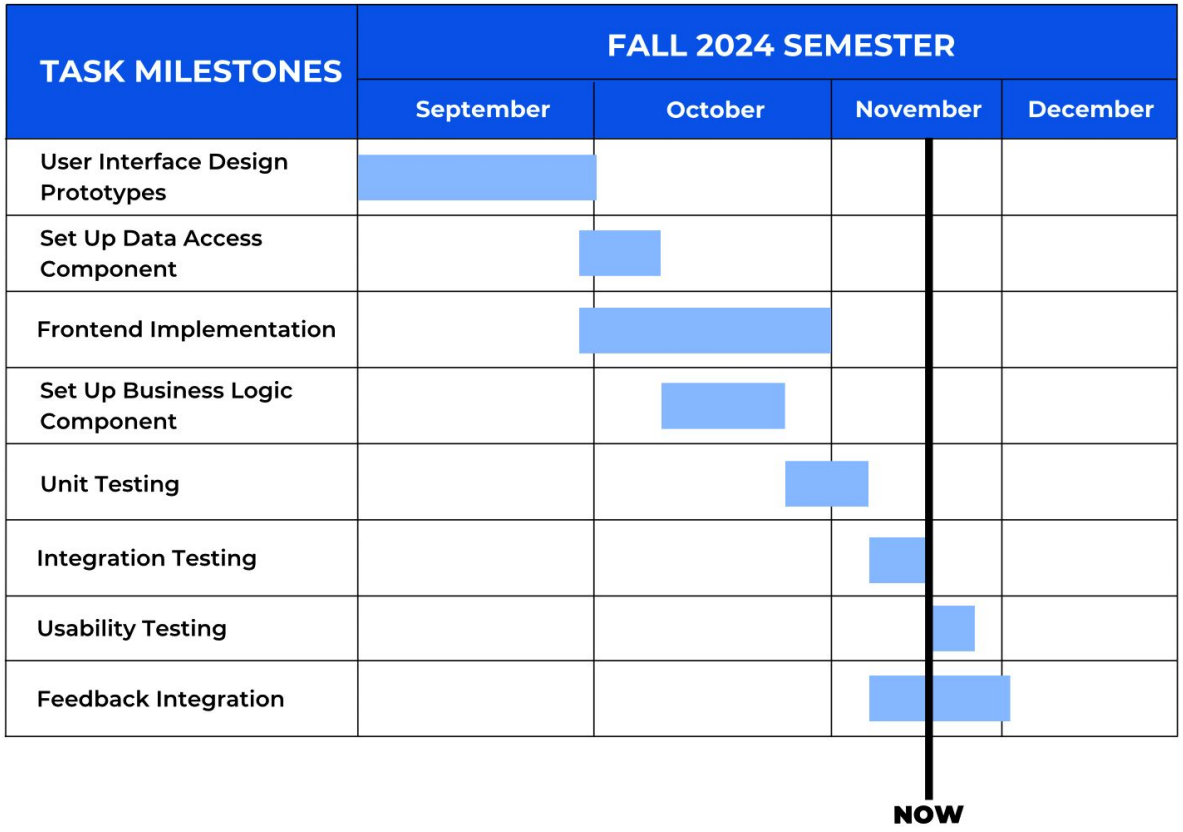
- Unit Testing (50%)
  - Core component functionalities
  - User authentication, content management, accessibility features
- Integration Testing (25%)
  - Front-end and back-end communication
- Usability Testing (25%)
  - End user validation

Key Metrics

- Task completion rates
- Error rates
- User satisfaction scores
- Accessibility compliance

Diverse Makers Project Schedule

Gantt Chart



Conclusion

Project Importance

Breaking barriers in STEM learning opportunities

Solution

Mobile application enforces usability and accessibility

Implementation

React Native, Google Firebase, and Google Firestore

Future Steps

Testing plan implementation

User feedback integration and validation

Deployment

Thank you!

Any Questions?