Designing a Community-Focused Indoor Heat Alert App for Vulnerable Residents

Ruby Thomas, Angelica Brito Diaz, Chukwuma Maduwuba

**Background**
- Heat events are becoming more frequent due to global warming [1].
- Vulnerable individuals do not identify as vulnerable to heat [1].
- Heat mitigation resources are not being used despite the extreme heat [2].

**Objective**
- Design a heat warning app to mitigate heat risk using our model that provides specific temperature predictions based on the user’s home building characteristics.
- Lower the heat-morbidity rate in low-income communities by raising heat-risk awareness, alerting users in dangerous environments, and supporting community-based mitigations.

**Methods**
- **Background**
  - Collected data from the community to understand stakeholder needs.
- **System Map**
  - Map system to visualize connections between factors.
- **Competitive Analysis**
  - Compare apps in the market to find good/bad elements.
- **Personas**
  - Create profiles of needs and wants that represent our target users.
- **Prototyping**
  - Sketch ideas for initial design on paper and translate the sketches into an interactive prototype.
- **Unity Development**
  - Start development of a deployable app based on the prototype.
- **Evaluation Plan**
  - Conduct user testing to evaluate the effectiveness of the app.

**Design Requirements**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localized Indoor Heat Index</td>
<td>Feature</td>
<td>Provide users personalized predictions of their homes indoor heat index.</td>
</tr>
<tr>
<td>Customizable Alerts</td>
<td>Feature</td>
<td>Allow users to set the frequency and type of notifications they receive.</td>
</tr>
<tr>
<td>Heat Mitigation Resources</td>
<td>Feature</td>
<td>Provide users with multiple recommendations for heat mitigation.</td>
</tr>
<tr>
<td>Social Connection</td>
<td>Feature</td>
<td>Connect users with their community to get help during heat events.</td>
</tr>
<tr>
<td>Heat-Related Health Info</td>
<td>Content</td>
<td>Give users information on how to stay healthy during a heat event.</td>
</tr>
<tr>
<td>Heat Index Hazard Levels</td>
<td>Content</td>
<td>Give context to the temperature by providing a hazard level.</td>
</tr>
<tr>
<td>Balance of Information</td>
<td>Design</td>
<td>Find a balance between too much and not enough information.</td>
</tr>
</tbody>
</table>

**High-Fidelity Prototype**

**Home Page**
- **Outside and Inside Temperature Prediction**
  - Gives users a prediction of their individual home’s temperature based on building characteristics.
- **Scrollable Hourly Forecast**
- **Check-In Notification**
  - Alerts the user which friend’s house has reached an unsafe temperature.

**Map Page**
- **Shows friend’s location & nearby cooling centers**
- **Provides specific cooling center information**
  - Crowdedness level, temperature, open hours, images, and distance from the user.

**Community Page**
- **Friends**
  - Users can send invitations to their friends.
  - Friends can see contact info, house temperature, and location.
- **Check-In System**
  - User can set alerts to receive notifications when that house exceeds safe temperatures.
  - Adds contact to “Favorites” list.

**Future Work**
- **Extensive User Testing**
  - Is the app useful to people during heat events?
  - Does the app change people’s heat mitigation behaviors?
  - Aim to launch the app to low-income residents in Summer ‘25

**Additional Features**
- Implement a learning/education feature.
- Add a customizable plan for heat mitigation.

**References**


**Acknowledgments/Funding Sources**
This material is based upon work supported by the National Science Foundation under Grant No. (2244586), Ulrike Passe, PI.