CPSC 490 Proposal:

A Secure Web Application For Connecting Homeless People And Resource Volunteers

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Home Connection is a social web platform for connecting local volunteers with homeless individuals for resource donation, including food, laundry washing, transportation, showering, temporary shelter, and mentoring.

Background

The primary inspiration for Home Connection, transhousingnetwork.com, is a Craigslist-style posting system hosted on a Tumblr blog which has demonstrated that the LGBTQ+ and ally community is eager to provide help to homeless and at-risk transgender people when given a platform for connection. However, this existing system has a number of shortcomings that the Home Connection project hopes to overcome. These issues stem primarily in the lack of security and ineffectiveness of a worldwide continuous stream of largely-uneditable personal-ad-esque posts. To make a comparison, Home Connection hopes to be to Home Connectionnetwork for connecting resource volunteers with the homeless what OkCupid is to Craigslist in the world of online dating.

Home Connection also seeks to help a broader audience of homeless individuals rather than only LGBTQ+ ones, while maintaining the ability to connect minority or otherwise demographically-specific homeless individuals with those who may wish to specifically reach out to them. It is worth noting that, despite common perceptions about lack of internet access to homeless people in general, more than 80% of homeless individuals get online more than once per week.

A prototype version of Home Connection, formerly known as TransHousing, was first developed in Professor Piskac’s CPSC 439 class in the spring of 2015 by a team consisting of Nicholas

Fieschko, Richard Chang, Shantao Li, Aiden Hu, and Stephen Krewson. This version was built with Ruby on Rails and MongoDB, and had basic accounts, messaging, requesting, reviewing, and a map view with filtering. Reconsideration of fundamental design decisions, especially in the realms of security, DBMS choice, and feature prioritization, however, has led to the decision for this project to be a full reboot from scratch in terms of code. The aim is to create a fully secure system with robust fundamental features able to be deployed to the live web and, to the extent possible, safely facilitate real exchanges between the homeless and volunteers who wish to support them.

**Term Goals and Project Description**

The first portion of the semester will be focused on the secure implementation of the foundational features needed for the application. These fundamental features will include accounts, messaging, an exchange system, reviews, search, and fine-grained privacy controls.

Due to the potential risk for victimization both parties face in the platform’s exchanges, the most crucial goal for real-world usability of this application is its security. Maximizing this requires thoughtful, well-informed design across multiple levels of development. As such, a major aim of the first portion of the project will be to research current technologies and techniques for the creation of a highly secure web application. Additionally, this aim will include designing the system such that trying to minimize storage of sensitive information, as well as the creation of thorough user-side privacy controls, is balanced with the need for ways to validate and communicate users’ trustworthiness to each other. Lastly, a framework must be designed to detect and respond to both technical breaches of security and to abuse by users. These security aims will be integrated with each step of feature design and development.

The second portion of the semester will focus on the user-oriented aspects and real-world deployment of the system. The former involves all aspects of the interface, such as front-end frameworks and design, cross-platform compatibility, accessibility, and internationalization, as well as further potential user-facing functionality and incentive features. The latter involves researching matters of legal issues, marketing, site administration, and robust deployment to the live web.
Implementation Details

The project is intended to be developed using the following technologies. Any changes or additions will be discussed in the final report(s).

- Back-end framework: Ruby on Rails
- DBMS: PostgreSQL with PostGIS
- Testing: RSpec, Cabybara
- Version control: Git
- Front-end framework: React and/or TBD

Deliverables

The deliverables for the project will be the full source code of Home Connection, as well as a 7-10 page report discussing what was learned, the design and implementation choices made, the development process, and any future steps.