WHACK 2019 Project Proposal

Automated Interior Design Planner for people transitioning from homelessness.

Motivation: We learned about this [organization which](#) helps people transitioning out of homelesness by collecting donated furniture and furnishing people's new homes. We had the idea for an automated tool which stores an inventory of donated items, loads a floor plan of the house, and automatically arranges furniture. Such a tool would save the organization time so they can focus on their goals.

Team Outline Name: What are you excited about this project?
- Jacob Smith : Documentation and Automation
- Jiayu An (Jane): web front end design and ios app development (7815410177)
- Luyao Pei (Louise): app design and possible AR extension （7812409340）
- Yuchen Xu(Annie): Software development/website

Background Research: We research existing furniture design github projects and applications, which are presented below. There is no existing tool to create an inventory for new items and automatically arrange them in a room. However, there are some useful existing applications to our goal, such as Magic Plan, which generates a room floorplan from a camera image. See below and Appendix A.

Furniture designing tools alike:
 These existing applications are the closest to what we want to create.
1. **Online interior room design**
   https://www.modsy.com/
   Take pictures of the room and take a style quiz on user preference.
   Paying $79-499 for an interior designer to design the room with consideration of available furniture within budget from nearby furniture seller.
2. Autostack Homestyler:
   https://www.homestyler.com/int/
   free tool that allows you to design a room in 3D or arrange furniture, mostly a designing tools.
3. Wikihouse: https://www.wikihouse.cc/
4. Cloudsight (object recognition api):
   https://cloudsight.docs.apiary.io/#reference/0/images-collection
5. GauGAN drawing tools (automatic photo generator using AI)
   http://nvidia-research-mingyuliu.com/gaugan/

Related Projects on Github:

These Computer Programs are the closest to what we want to create

1. https://github.com/lteu/furniture_arrangement (an automatic furniture allocation program) //Mathematica (a paid software) is required for this project
2. https://github.com/wikihouseproject/Microhouse (project that uses wikihouse to design)
3. https://github.com/PulkitMathur/iMaterialist-Image-Recognition (Automatic Product Recognition for Home Goods and Furniture Images)
4. https://github.com/odegeasslbc/HomePlan (home furniture layout designer)
5. https://github.com/guoshenglong/Furniture_Stefan
   Chinese github tool that allows AR filming. Users can use fingers to move and arrange furniture on screen and to have a very realistic way of visualizing arrangement. Also have data mining tools, and allow users to share their design through social network.
6. https://github.com/Nader27/FurnitureGo
   Enable uploading of furniture model and make it into 3D form and present it with

Procedure:

Our Envisioned Plan for how someone would use our application

1. Scan donated furniture (access width, heighth, shape, function) (maybe get access to data in storage) Roomle
2. Scan target room (size, height, empty space) Magic Plan   Floor Plan Crearoe
3. Ask for users' preference (budget, layout)
4. Layout furniture and Visualize on App RoomSketch

Additional Features:

We will implement these extra features if we have time

- 3D Walkthrough of Room with Oculus Rift
- Use of a robot to autonomously generate 2D Map
- Texting Service to Request purchase of needed item

Question list:

1. Can we use existing APIs as an extension for our project? Sure, open source
2. Is this project feasible? Yes,depending on automated vs user input
3. Advice for ios app development? Need a mac, they have code samples

       a. We can have emulation running, we would have to get app store approval for morehttps://developer.apple.com/xcode/

    4. Team management, sync up great

Appendix A:
Related Design tools and comments Table

Tool	2D Layout?	Inventory Integration?	Photo Integration?	3d Walthrough/Augmented Reality?	Survey Integration	Comments
RoomStyler	Yes	Yes	Yes	No	No	2d layout tool
Havertys Room Planner	Yes	Yes	No	No	No	2d layout tool
modsy.com	No	No	No	Yes	Yes	Great suver feature
Roomle	Yes	No	No	Yes	No	Scan reality furniture and integrate to inventory
RoomSketch	Yes	No	No	Yes	No	Visualize 2d layout sketch to 3d view
MorrisaThome	Yes					Great Simple 2d layout tool
BathRoom Planner	Yes	Yes	No	No	No	Customizable room outline,

						organized by collection
Room Arranger	Yes	No	No	No	No	Simple layout tool, includes multi floor
Design Crew Room Planner	Yes	Yes	No	No	No	
Magic Plan	Yes	No	No	No	No	Creates Floor Plans with Camera
RoomScan Pro	Yes	Yes	No	No	No	Creates Floor PLans with camera
Conlins	Yes	Yes	No	No	No	
Jeromes	Yes	Yes	No	Yes	No	
Floor Plan Crear	Yes	No	No	No	No	Great parametric modling of room outline
Plan our room	Yes	No	No	No	No	Simple Placement Tool
Amikasa	Yes	Yes	No	Yes?	No	Very Clean user interface

Mentor Feedback

    Ata scraping: just try for chairs
    IOS App: who is using app?
        Intake, van filller
    Database
    Algorithm
        Varying levels of feedback
            First Prototype could be user putting in a lot
    Rev 1: Pictures

Scratch Notes:

From Louise:
~~I am trying to build login system in the website. I have similar code to apply on. If not work, pretend nothing happened :)~~

OK. I failed, nvm : (
https://github.com/SyedKhalidHussain/Login
http://www.passportjs.org/ Try using this instead

DataBase Building Notes: