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TagIt

Have you ever wanted to try your hand at graffiti, but felt discouraged by those pesky vandalism laws? With TagIt, now both you and property owners can be happy! TagIt is an application that allows users to draw on rectangular bordered surfaces in an augmented reality landscape. Anyone else viewing the world through the augmented reality of TagIt will be able to see these drawings. Only the most recent drawing can stay on a surface at a time, adding a turf war aspect akin to Pokemon GO. TagIt targets those who want a greater variety of augmented reality experiences. The project also has the potential to redirect mischievous intent into less harmful avenues, or spread awareness for the latest local events.

The primary competitors to TagIt are other augmented reality games already in the market such as Pokemon GO. In order to be successful, TagIt needs to gather a large enough user base spread out through various regions in order to keep app usage dynamic and novel. The primary difference that TagIt has from Pokemon GO is that the app allows for more creative and user defined use, because any rectangular object can be used within TagIt's augmented reality and can be painted with whatever the user wants. Additionally, TagIt attempts to place the virtual content, instead of simply overlaying it an angle set by the gyroscope, making it a more natural experience. Users can leave each other notes, perhaps advertising a rally through the app instead of posting signs or drawing with chalk on the ground. Or users could potentially treat the app as a game and compete to try to keep their drawing on an area.

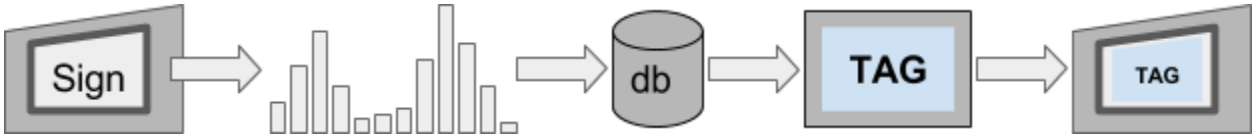
Other competing features include Snapchat and Google Translate for their user-drawing overlay, and AR text-translation technologies. However, Snapchat does not allow fully public publishing of drawings, and does not track objects, while Google Translate is restricted to only superimposing the translated text. Thus, neither provides the creative geotagging TagIt would offer.

Software Architecture

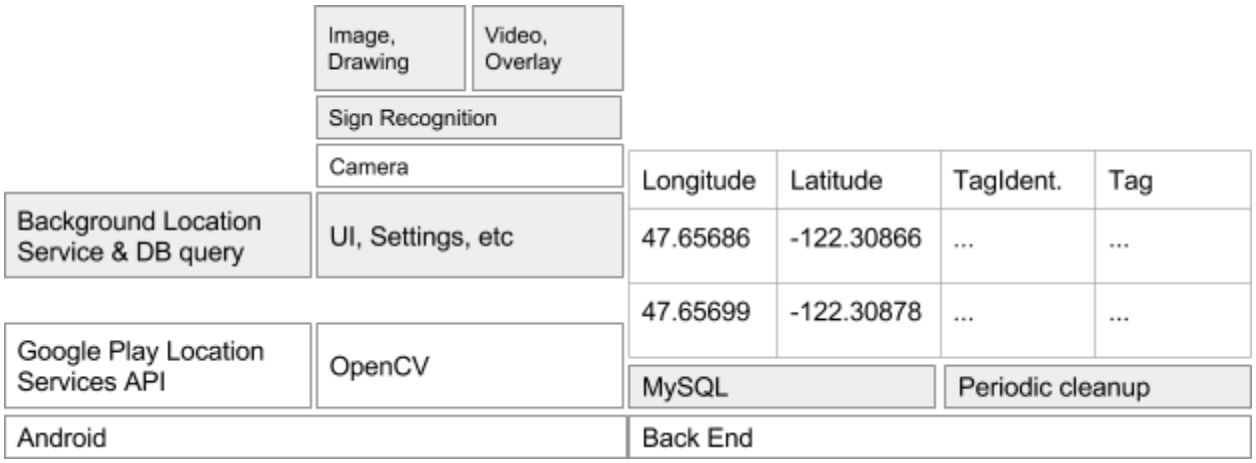
TagIt would primarily be based off an Android app, using the phone's location and OpenCV or a similar computer vision library. A sql database would be used to store and retrieve each tag location using longitude, latitude, and a tag identifier. The identifier would be a unique histogram or similar hash of the sign being tagged. The app itself would periodically ping the backend for nearby tags, and when one is within range, try to identify matching signs to project the drawings onto. Signs would be identified by finding strong contours in rectangular shapes (either manually through interest point / edge detection and line detection, or through library calls). This service would be used by both the drawing activity to clip the user's canvas, and the video projection activity. The drawing activity will use a static image of the sign, while the video projection may require interest point tracking to cut cpu cost in video project.

Sign Detection

Round Trip



Architecture



The main risk of developing TagIt is to ensure that the proper functionality is delivered within the timeframe. It might be tricky to smoothly superimpose images onto signs if they are viewed at an angle. In general, AR can be tricky to get right because lighting and angle change everything. We may not be able to achieve the high success rate of identification and projection required for this to work smoothly, but we can constrain our efforts to easier scenarios like indoor lighting and near-orthogonal viewing angles, and broaden out from there.

TagIt also runs various social risks. A malicious user could possibly tag derogatory or offensive content that would be upsetting to other users, or use the application to lure users into unsafe locations. It's also especially important to make sure that user location data is protected that the application is secure enough to protect the user's privacy. The risk can be mitigated through the usage of warning messages, as well as allowing users to report content and having moderators sift through content. As the application scales, moderation will become more and more difficult. While moderation and warning cannot completely eliminate the risks of social applications, they will hopefully make the TagIt community much safer.