DAP Project Pitch

Purpose:

People take photos in their daily life and lots of the photos need post-processing to be perfect. So I plan to build an application to edit photos based on deep learning methods that blooming recently, stage 1 will focus on removing obstruction in photos.

The application details are as follow:
-Input: User should upload a photo to be edited.
User draw areas on the photo to specify obstruction are to be removed.(User may draw the whole area with brush or draw a closed boundary with pen)
Optional: User may select the photo type such as natural, animal, portrait
-Output: A new photo which obstruction is removed
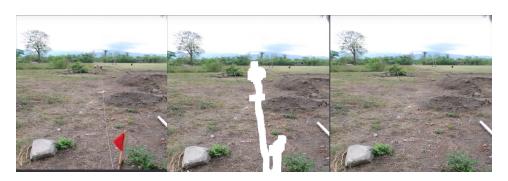Optional: a suggest area that should remove.

Feasible:

-machine learning models: There are 2 models, one for inpainting and the other for area suggestion
- Inpainting: Use algorithm developed by Nvidia:
Image Inpainting for Irregular Holes Using Partial Convolutions(details at https://arxiv.org/abs/1804.07723 and https://news.developer.nvidia.com/new-ai-imaging-technique-reconstructs-photos-with-realistic-results/)

Origin   User input   removed

        - Suggestion: Collect data from user input, paired data like "origin" and "user input" images. The first is the input image and the second is suggestion remove area. We can use classic image segmentation algorithm like Unet or Fast-RCNN to segment the input image into two parts as 'should remove' and 'shouldn't remove'. Once our user input enough data, we can train this suggestion model and so that we can then take only image itself as an input without the user input area.

All above models are well developed and open-sourced by researcher. So all we need to do is build a application to capture and save user data and actions. Then, we just need to train online models based on the data and predict new data.