Capstone Project Proposal

Mohamed Amr

Business Goals

Project Overview and Goal What is the industry problem you are trying to solve? Why use ML/AI in solving this task? Be as specific as you can when describing how ML/AI can provide value. For example, if you're labeling images, how will this help the business?	An online photo editor for the photography industry. The photo editor aims to save time and simplify the process of editing photos. The photo editor app helps the designers, and editors to create a full, rich experience for the users or customers. In addition to the regular editing tools (like Crop, Rotation, Drawing, and Shapes); we provide the user with three powerful computer vision techniques to cut, color, and add images.
Business Case Why is this an important problem to solve? Make a case for building this product in terms of its impact on recurring revenue, market share, customer happiness and/or other drivers of business success.	The app will create a full user experience. Moreover, the app will make editing photos easier for beginners by avoiding all complex tools from Photoshop and similar software.
Application of ML/AI What precise task will you use ML/AI to accomplish? What business outcome or objective will you achieve?	**Image Colorization:** The editor deals with the process of taking a grayscale input image and then produces a colored image that represents the semantic colors and tones of the input. **Image Segmentation:** The editor benefits from the concept of Image Segmentation to extract some parts from the image and return a png photo. **Deep Painterly Harmonization:** The editor produces significantly better results than photo compositing or global stylization techniques and that enables creative painterly edits that would be otherwise difficult to achieve. The outcome is to automate the process of editing photos and make editing easier for beginners.

Success Metrics

Success Metrics What business metrics will you apply to determine the success of your product? Good metrics are clearly defined and easily measurable. Specify how you will establish a baseline value to provide a point of comparison.	**Output** 1) Improve the model's accuracy. 2) Optimize the code to reduce the runtime by 20%. **Outcome** 1) Increase the number of active premium plans. 2) Increase the market share with similar app.

Data

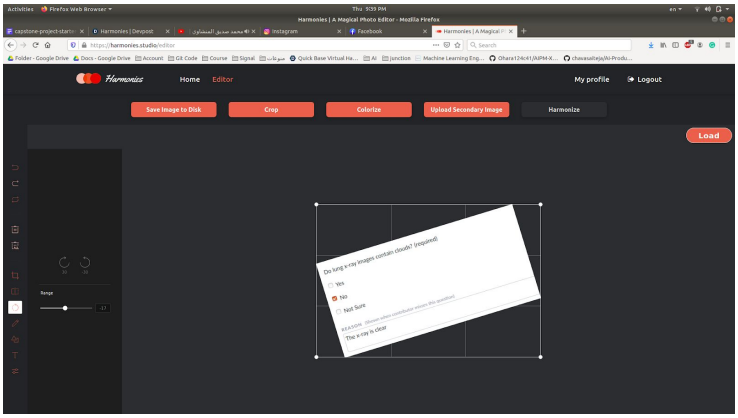
Data Acquisition Where will you source your data from? What is the cost to acquire these data? Are there any personally identifying information (PII) or data sensitivity issues you will need to overcome? Will data become available on an ongoing basis, or will you acquire a large batch of data that will need to be refreshed?	We will need grayscale images to train our 1st model. We will scrape data from google normal images then we will create our own dataset by applying a grayscale filter. The costs will mainly be based on the server that runs the scraping script and the cloud storage. We will follow the differential privacy approach by describing the patterns of groups within the dataset while withholding information about individuals in the dataset.
Data Source Consider the size and source of your data; what biases are built into the data and how might the data be improved?	Initially we started with this data from kaggle for the 1st model. Then we will create our own dataset from the user's images. We will try to reduce biasing effects by randomly and continuously scrape images from google image search engine.
Choice of Data Labels What labels did you decide to add to your data? And why did you decide on these labels	The model is too simple. We just need **Colored**/ **Grayscale** as labeling data. Because our model takes the grayscale image as input and reuter a colored image as an output.

versus any other option?	

Model

Model Building How will you resource building the model that you need? Will you outsource model training and/or hosting to an external platform, or will you build the model using an in-house team, and why?	We will use lambda function from AWS also we will consider saturn cloud to pay just as we go while running the model. For the hosting we already deployed the three models as RESTful APIs on Azure. The model has already been built by the in-house team.
Evaluating Results Which model performance metrics are appropriate to measure the success of your model? What level of performance is required?	In our case, we are looking for different evaluation approaches while working on the first and third models: 1. Manual GAN Generator Evaluation 2. Qualitative GAN Generator Evaluation 3. Quantitative GAN Generator Evaluation For the second model we look for the Pixel Accuracy.

Minimum Viable Product (MVP)

Design What does your minimum viable product look like? Include sketches of your product.	We already launched the photo editor with the basic editing functions. Also, we deployed the models for beta testing and mentoring. https://harmonies.studio/ 
Use Cases What persona are you designing for? Can you describe the major epic-level use cases your product addresses? How will users access this product?	We target designers and online marketers who have internet access and aged between 25 and 40. The users will access the editor via our web app and mobile app as well. The use cases of the ML models will be integrated features that ipower the user experience.
Roll-out How will this be adopted? What does the go-to-market plan look like?	**Market Analysis** – Customers need to edit photos quickly and efficiently. There are some similar apps like Remini but we created a full users experience. The partnerships maily will be with cloud providers. **Market Selection** – We go after novice designers and people who want to create professional edits to their photos with the click of a button **Marketing Mix** – We are a photo editing platform, selling Premium accounts.

Post-MVP-Deployment

Designing for Longevity How might you improve your product in the long-term? How might real-world data be different from the training data? How will your product learn from new data? How might you employ A/B testing to improve your product?	Basically, we will try to improve the model's output for the best user experience. Also, we will add more features after the success of the initial MVP. Moreover, the coloring model is biased to landscape images, so we will collect more images then we will retrain the model. As the platform works, we will search for appropriate open source projects and previous works and compare them with current models to apply A/B testing for the best results.
Monitor Bias How do you plan to monitor or mitigate unwanted bias in your model?	We will focus on manual testing and getting feedback from users. As our model output is relative and differs from person to person.