Tell us what your idea is.

App that helps to learn how to draw and unleash creativity. Gives ability to take picture of smth you want to draw, extract object, prepare sketch*, detect geometry patterns and build step-by-step sketch drawing process. Mainly focus on children and it's parents.

My own usecase: daughter asks 'let's draw a cat'. Need at least to find a cat to draw or imagine one. Understand how to draw it. Draw one.

ML could help on different stages of process:

- Help to detect contours/objects and cut out objects*
- Build a B&W sketch of the object*
- Extract geometry patterns, symmetry lines, scaling templates
- Define order of drawing and play sequence of image appearing step-by-step
- Help to compose the scene by already defined tags of cut objects and knowledge what could be good addition for the composed scene (future possible feature)
- Similarity score calculation to 'mark' user's sketch with original sample

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Already in MVP using flutter, custom ML model for MLkit and native code for android to process images..

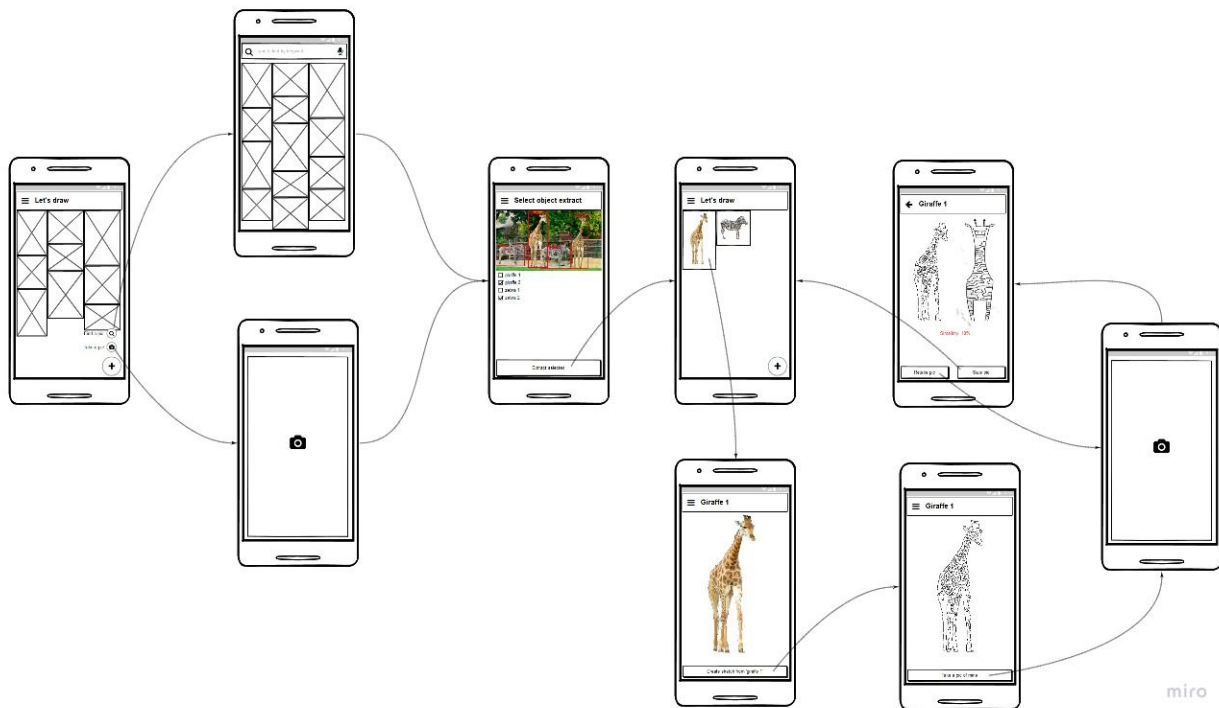*Describe in 250 words what the feature or service will do and how you'll use Machine Learning to push the bar*

Tell us how you plan on bringing it to life.

Ready to install APK could be found:
https://github.com/dryaz/paint-teacher/blob/master/pt_mvp_01.apk

V1 is built compared to this flow but atm without similarity check:

MVP App is built with flutter but is built only for Android atm since it uses native bitmap processing to create Sketch. Object area detection is using 'coco' model found here:
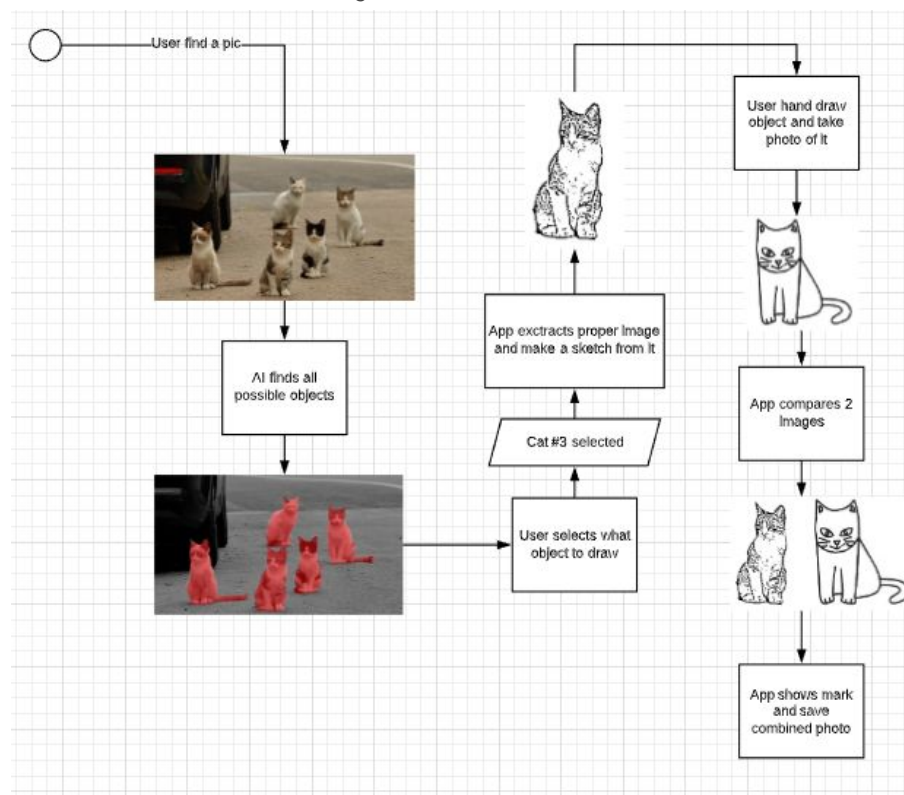https://github.com/azihsoyn/flutter_mlkit/tree/master/example

Initial MVP was focused on bringing very basic prototype to live as POC. Even sketching process is very poor atm, working on it.
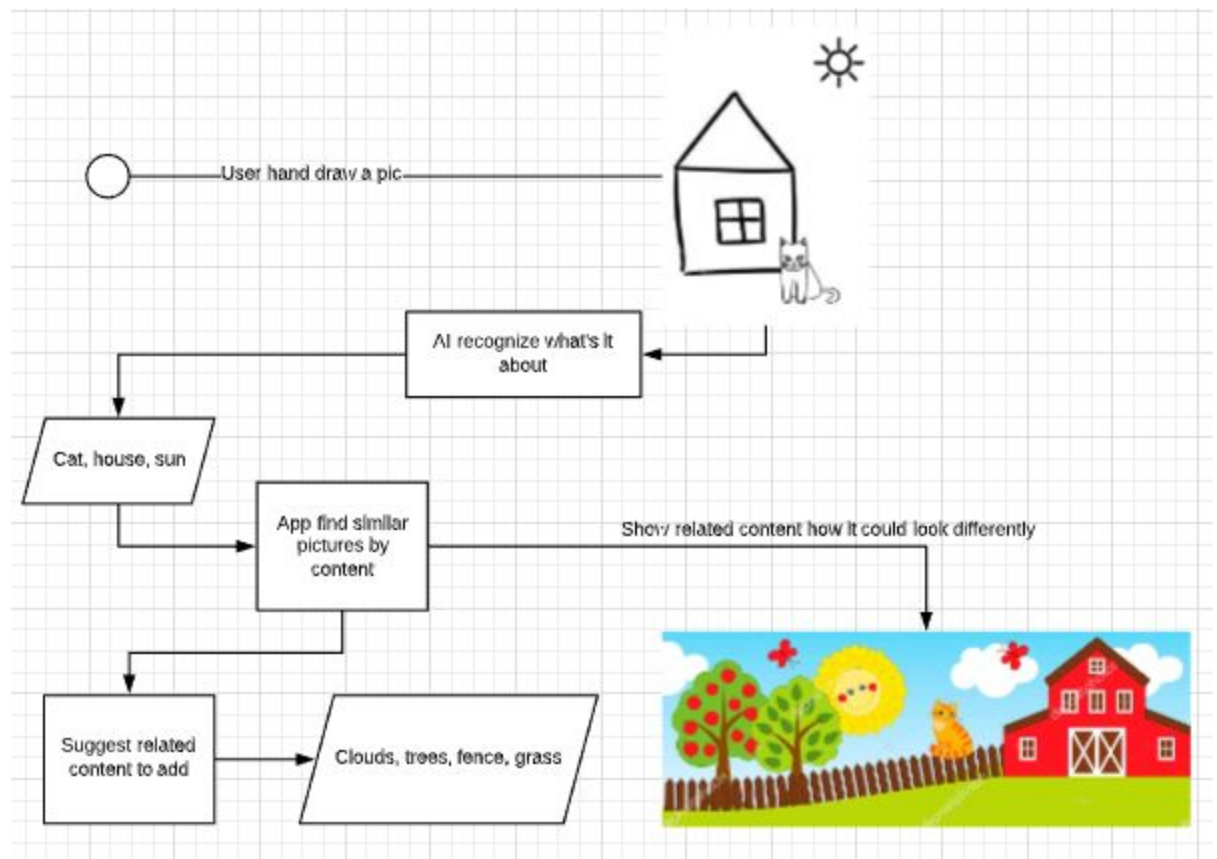
The whole App features is divided to 2 big parts:
1. Learn how to draw smth.
   a. Extract objects
   b. Prepare sketch for image
   c. Describe how to draw the image

2. Unleash creativity
    a. Suggest how scene could be composed with smth you already drawn
   b. Find good addition for object/scene

Google's help much appreciate for
- Object contour detection to let cut out the object. It could be done without ML like described here (https://datacarpentry.org/image-processing/09-contours/) but ML I guess could provide better result. I assume that Google.Photo has much more accurate model.
- Object tag detection. As a part of previous step also object tag as 'cat', 'human', 'nose' etc. could be useful for the next functionality like described in 'Unleash creativity' section.
- Similarity score calculation. Google.Photo could already have much things about it.
- Geometry patterns and drawing process. I guess https://quickdraw.withgoogle.com/ is about it.

Timeline by features:
- Improve sketch generation.
- Improve object cut out process. Remove bg properly etc.
- Implement similarity score computation by taken picture + original sketch sample.
- Find pic by keyword to draw smth.
- (Most challenging part). Work on drawing sequence by geometry patterns to let see not just single sketch by step-by-step drawing process. Don't have completely vision how it should be in final version, work on it, but smth like
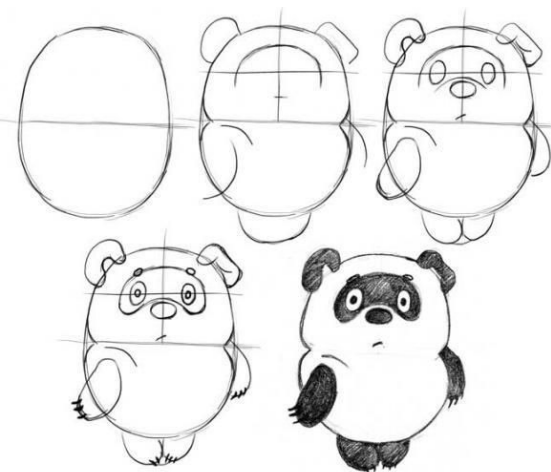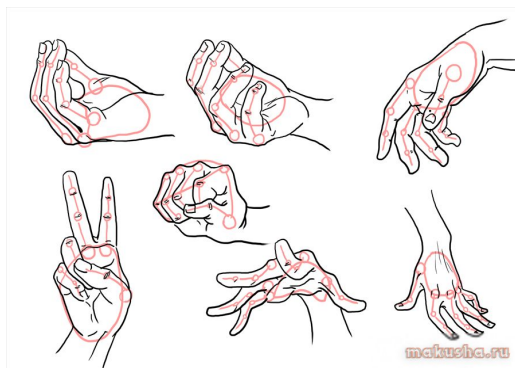
Timeline by dates:

POC provided at the beginning was done in ~2 days with no pirior exp. with MLkit and just little exp. with flutter itself. The most challenging part is draw sequence which I have no clue how long it could take atm without doing research in advance. The milestones are to release v1 with sketch, similarity score, polished UX, inner analytics etc. before EOY. Then work on drawing paths until May.

Release before EOY could help to collect feedback and tune algorithm if necessary.

Describe where your project is, how you could use Google's help in the endeavor, and how you plan on using On-Device ML technology to bring the concept to life. The best submissions have a great idea combined with a concrete path of where you plan on going, which should include:
- *(1) any potential sample code you've already written,*
- *(2) a list of the ways you could use Google's help,*
- *(3) as well as the timeline on how you plan on bringing it to life by May 1, 2020.*

Tell us about you.

Android developer since 2010, Remote Android contractor and Moscow community leader at Toptal - "Top 3% of Freelance Talent" since 2016. Currently "Lead android developer" in Sonect (https://www.sonect.net/).

I made several apps completely by myself that could be found under https://play.google.com/store/apps/developer?id=dimlix

Worked on "Yandex browser" that has 100+ millions of installs.

Author of articles in Russian and English on Android topic. Open source libs contributor. Writing to personal blog at https://dimlix.com about android development.

Top 5% on stackoverflow for Android: https://stackoverflow.com/users/527808/dilix

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A great idea is just one part of the equation; we also want to learn a bit more about you. Share with us some of your other projects so we can get an idea of how we can assist you with your project.

Next steps.

- Be sure to include this cover letter in your GitHub repository
- Your GitHub repository should be tagged #AndroidDevChallenge
- Don't forget to include other items in your GitHub repository to help us evaluate your submission; you can include prior projects you've worked on, sample code you've already built for this project, or anything else you think could be helpful in evaluating your concept and your ability to build it
- **The final step is to fill out this form to officially submit your proposal.**