



Tell us what your idea is.

Hi everyone!

I am a developer who is passionate about ML technologies in Computer Vision area. I know that nowadays AI steps far away from Cloud computers boundaries so Mobile CV/ML apps are rising with incredible speed. And as a developer with CV experience, I can say that every enthusiast who wants to create a beautiful and fast ML/CV app for Android devices will face a bunch of problems like efficient data preparing and postprocessing, implementing the infrastructure for ML framework, etc. Talking about ML for video streams I can see that the process of preparing each video frame can be resource-expensive operation. In the worst scenario, it could reduce the performance of the app at least twice!

So my **idea is a simple, flexible and high-performing tool for Android developers** to make the process of integrating new **ML algorithms for video editing and analysis** way easier - in several lines of code!

I called the library **VisionAI** and for sure it will be **the Open-source project!**

The library reduces the amount of boilerplate code for creating an infrastructure around ML such as - Retrieving video frames and converting it into arrays of color data, Normalizing data, Down/Upscaling of bitmaps, etc - and helps developers be focused on main ML part of the app. With that VisionAI provides simple and understandable API for new ML algorithms and "Processing Steps".

So one of the use cases can be represented by the following steps:

1. User (developer) load video from storage or open camera video stream. Using VideoSource implementation from the library.
2. By several first frames or by a set of frames from different parts of the video file, VisionAI analyzes the main Thema of the video - simple classification for 5-6 classes.
3. Base on the previous step result, VisionAI provides a set of Effects corresponding to the video Thema (such as Style Transferring, Masking, etc)

For sure ML effects can be mixed in chains, also there is a simple API to add new ML effects by the user (developer)



Tell us how you plan on bringing it to life.

First of all, I want to note that it is **an open-source project**. Every Android developer should be able to use it **for free**. My main idea is to **populate on-device ML solutions in mobile development**.

The project is currently under active development stage. Data science experts and developers from the company I work for contribute to the project. We are using the best open-source practices and the [GitHub project](#) for issues tracking.

In the repository, you can **find 2 libraries modules and sample app** for demonstration.

We are working on implementing High-level API for ML effects - in the context of the project it is called "ProcessorStep". So each Step includes preprocessing, ML inference and postprocessing logic. We already created several "Steps" using TFLite - ArtisticStyleTransfer, Object Detection, and Classification, etc - in our plans to extend the set of ML algorithms and models for much deeper video analysis. Also, there are several more modules in our roadmap, for other popular ML mobile frameworks and solutions like a wrapper for MLKit, Qualcomm AI engine, MACE, and Caffe2.

All above is only a few first steps - the final goal is to create a fulfilling, AI system which will take any audio/video content -> proceed it with ML techniques -> create a local project (probably with a lot of metadata in local database) -> provide the user with wide and flexible set of instruments for video editing (including applying ML effects for separate frames or whole the video) and analyzing (tracking objects, segmentation, caption extraction, etc).

This project can be **a good base for a new generation of video playing/editing systems!**



Google help:

We would really appreciate it if Google supports us in project development. We know that the best in the world ML professionals are working for Google. So we see the following points for interaction:

1. ML specialists can share with us knowledge about suitable ML model architectures and techniques.
2. Software engineers can advise us with the most optimized ways to process video data on an android device (like more details about Render Script system).
3. For sure if Google featured our project it would bring more contributors and increase temps of development and quality of the solution!
4. Help us to make the project visible for developers

Our Timeline:

- Till December 2019 - developing a local database system. Extending ML effects base.
- December 2019 - CI and Public Artifacts set up. First alfa versions of libraries
- January 2020 - Audio processing system implementation. Update ML modes zoo
- March 2020 - New ML frameworks integration. Refresh ML modes zoo.
- April 2020 - Showcase application updating. Branding. Publishing on Play Market.

Tell us about you.

My name is Boris Denisenko and I am a software engineer with more than 12 years of experience in the IT industry. Nowadays I am living in Leipzig, Germany and working for the Appsfactory company.

Last several years I have been focusing on Mobile development using CV algorithms with different variations of on-device ML techniques. So I took a part in several relevant high-performance mobile projects which were using mobile architectures of ML models for fast inference directly on the device. As a result, I got a brilliant experience to share, and [my work was featured by the Qualcomm company.](#)

More information about me and my projects you can find through my [LinkedIn profile](#)

However, I am only **one of the developers** who are working on the project. Management of Appsafactory appreciates and supports employee's contributions to open-source projects so **data science professionals and software engineers from my current company are taking an active part in the project development.** This project will be a part of the portfolio of our company

