Please make a copy of this document and include this in your GitHub repository for your submission, using the tag #AndroidDevChallenge

Tell us what your idea is.

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

"Ballet" will basically be a port of https://github.com/tensorflow/compression to TFLite. It will be released as an AAR for use by other applications. I will include a demonstrator app that shows how to use the library to compress and decompress an image file.

Tell us how you plan on bringing it to life.

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.*

1) I am posting work-in-progress code to https://github.com/hromadka/ballet
2) I talked to Nick Johnston about this at ICLR 2019 in New Orleans. He indicated that it was largely a matter of writing the custom C ops in TFLite. We both agreed that this was something we wanted to do, but just weren't getting around to it yet. I could use Google's help by facilitating Q&A with the TF developers, by supporting docs about the TFLite roadmap and ICD for the current custom operations, by maybe providing build/test support (for the full range of Android OS and device emulators), and by answering a few questions about accessing onboard device GPUs. Honestly, I think the biggest way Google could help is by giving me a hard deadline to force my focus onto this for a couple weeks.
3) Prior to early February, I'll have the demo app and a placeholder library developed. I'll reach out to the TF developers in advance in case I can get an early start on the custom C ops. Following the

bootcamp, I'll spend March implementing the custom ops and testing on Pixel 3 and Pixel 4 phones. My main concerns are hardware: memory caps and accessing the GPU directly. I think I should have everything working by early April. I know it's a little strange developing an AAR instead of a releasable app for this DevChallenge, but I think that an image data compression component would be a valuable addition for innumerable apps.

Tell us about you.

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.

I am a software developer with about 20 years of experience with mobile devices. I began working with Caffe-based image applications after GTC 2015, and then switched to TensorFlow when that first beta was released. I am currently focused on products deployed on Android phones, Coral TPU edge nodes, and NVIDIA Jetson Nano devices, but I primarily run the ML training sessions on HPC (not so much cloud, yet). I badly want to get this compression lib done before I have to context switch my brain over to learning about spiking neural networks.

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.**