

Searching videos with fast.ai (part 1)

Now we'll take what we learned, making models for images and apply the same ideas to analyzing videos. The key principle here being that videos are just really made up of a lot of images so we can extract those images, analyze them and then help find objects inside an entire video.

OK. Let's go back in the collab. And you click on Gethub and type Quartz.

This time, the notebook we want is EE searching videos with fast A.I..

And here's our plan. We want to find moments in this video where a bicycle appears, you can imagine this being a long, long video.

It's only 40 seconds or so, but we're going to use that as an example for how we might look for certain frames, certain objects or certain scenes in this video or any video.

So our plan is to download training images that are sorted into two folders, bike and no bike. And then we're going to download a computer vision model. That's our resonant model that's pre trained on 14 million images. But we'll further train that model with our bike, no bike images using transfer learning, which we learned earlier.

And then we'll chop that video up into frames one per second and use that model to detect bikes in those frames. OK, so let's make sure that we set our runtime to GPU. There we go.

And don't forget to do that and then we'll run this cell to load fast A.I.. And then we're going to run this cell, this loads in some libraries and things that we're going to need for this particular notebook. Great. Finally, we're gonna go get that data and this is gonna be all of those images, the images with bikes, images without bikes. OK. And let's just take a look. Now we have a directory called Bike's Data. And in there is a directory called Images. We can look in there. And there are our folders, bike and no bike. And so if we take a look inside the bikes image, you'll see there's only fifty five images we're using for each of these categories. If we take a look at one of them. So 1494. It's this one here. Let's take a look at that. There you go. These are just pictures I took of bikes in Manhattan, sometimes people riding them, sometimes not. And I also in the same neighborhood just took pictures that didn't include bikes. That's what this dataset is.

OK, so here is our data block again. It's super important that we understand how this is all happening and how we get all the data into this data variable. So we're going to start out by setting the data path. That is the path to our images. So fast A.I. knows where to find our images. And we're going to talk about transforms in just a little bit. So here we're where I'll just say we're getting some transformation, some randomization. That's kind of the default set. So we'll get more into that in just a little bit. And here is our data block. So we're going to again, get our images from folders on the data path. So that's the data path right there. And the images are in there. Again, we're going to split validation and training sets by a random assortment and by a percentage. So that means we haven't split them out ahead of time. We're just saying go ahead and randomly pick them into training and validation sets and get the label from the folders. So there there are folder labels are bike and no bike. So we're gonna go with that.

We're going to apply our transforms, which I said are just the default transforms. Again, we'll learn more about transforms in a little bit. And then we're going to also just make sure the size that we're analyzing is 244. I'm sorry 224 by 224. So we're going to squish these down into these little squares. That actually it doesn't matter that we're doing it that way and actually can really help in our training.

Finally, we'll package that all up into a data bunch. Our batch size because we have smaller images, we can increase the batch size. We can throw more images at the GPU at once. And so that's with that B.S. is batch size. So if I go hit play on this cell.

OK, that's done.

And I can hit `data.showbatch` and we'll just see three rows and just take a look at what we've got. This, again, is our data. This is what we'll be training the model with. Let's take a look.

OK, so we have some images that ended up upside down. Not quite sure why that happened. It's actually OK, though. You can see, maybe you can't see, but there's no bike in this way and there's no bike here and there's definitely a bike here. It's upside down, but that's actually OK. No bike here. No bike. There's a bike in this image. It's actually right there. It's kind of hard to see. There's definitely a bike there. And bike here. Again no magic happening. These are just the folders I sorted these into. No bike here. No bike here. But there is a bike here. A couple of them, actually.

So this is the data that we have sorted ahead of time. About 55 no bikes and 55 bikes. This is just a sampling of them. And let's just check to make sure that we only have two classes. We do. Bike and no bike. So we're set. We're ready to do our training and our data is prepared. Next video, we'll actually train this model.