# Test Summary of Part of the Lecture

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Alright, so like I said i'm Sonia and we're gonna talk about image understandings slash computer vision in the Semester. These are all the information that you guys already have class website it's actually encore quiz the link, but you know, just in case here is the link to the website or material like lectures so pdfs tutorial. If you find some really nice links and the that you want all your class classmates to know about just pose them on quirkiness you know, this is a very empirical field and it's developing fast so let's share any nice materials you guys may found. In different algorithms to see how they're working on images and videos and so on, so me no, no, I had a program is important um I don't necessarily require you to know any of the specific languages, I hope you guys can see my mouse over here. This is not a requirement but we're going to actually devote at least one of the lectures to kind of have you up to speed, at least the basics in your works actually judy's gonna talk about that later in this course. was to require for this class in terms of how we're going to agree with you and we're going to have for assignments, and a project, so there is not going to be an exam or even like an oral real or oral exam we're going to be, you know doing this work as we go through through class. What our assignments So these are you know it's gonna be a mix of short theoretical questions, but mainly programming exercises are going to allow you understand the course Okay, you will be given roughly this assignments, are going to be given roughly every two weeks with maybe like. February, been exceptions, because there's reading week and we're going to start, I think the first assignment is going to be in about two weeks, maybe a little bit later. We have had the algorithm before and it has not ended well, so please work on your assignment alone, this is your individual work that we're going to be grading also don't look for solutions online all right, that can also result in parentheses very easy to find if people actually copy. And you know you can take our project as a bigger assignment where you're going to be able to put all the knowledge that you acquire in this course into know, maybe programming something a little bit bigger and see maybe some more interesting results in action. And kind of roughly when they're going to be due why I say roughly is because you know, given how much questions you guys have or any kind of unexpected. Development you know, this might be pushed by a few days backward I like push it forward, but maybe backwards, just in case we were running behind in terms of the material Okay, but this is roughly the dates we're gonna follow. So it's actually important to write all your code all your assignments in one programming language don't use something in matlab or something as important, because you're gonna be you're gonna have a hard time reusing that code later on. i'm that lane right lateness show we're going to be, you know relatively nice here so everyone is going to be given three free late days. Right, meaning that there's going to be a deadline on some day is going to be midnight and as soon as you're like one minute later 24 hours late that's going to be one day penalty Okay, but you're given three. You know, three free days seems fair anything beyond that means that that assignment is not going to be it's going to be as euro we're not gonna take it. Okay i'm not gonna go through the syllabus but roughly, this is what we're going to talk about these are kind of the key algorithms on that I think everyone should know for computer vision, since we don't assume that you guys know machine learning, we cannot really talk about very deep. yeah it's gonna happen, but maybe not all of you needed, so the tutorials gonna cover Python so basics of Python especially kind of the basic operations, you need to know for working with images. Higher lower than me image high visualize it and so on, plus maybe some very basic things about peyton So if you know that no need to come today, if you want to kind of brush on to that, then yesterday's going to be a short tutorial on on that. Otherwise, just you know send me an email or post it on coworkers we are going to be monitoring that alright so maybe we can get started and we're going to spend the first hour i'm just going to try to motivate computer vision, why is it such an cool fuel. Okay, so the kind of the basic definition of what we're trying to accomplish here is, you know, we want to develop automatic algorithms right that would see. Right so imagine that, if we want to have a robot that's going to eventually go around in our House and clean and maybe you know do other things like. Information but it's it's it's much harder than if you actually have vision Okay, so the goal is going to be, we have cameras on this guy over here is going to move around, is going to capture. And I want to, maybe even understand what kind of material properties right is a squishy or is it hard, is it plastic because i'm going to interact with this object in different ways if it has different materials. You know, so we also need to infer this kind of properties from from images or maybe a sequence of images okay Likewise, I need to understand that the SOFA is actually flat because maybe you want to sit on it right and again this is all very, very hard problem. Vehicle that has some sensors and cameras, maybe later some top anyone still autonomously navigate around the city and you know, ideally, not crash into anything and just be like a regular participant of traffic right and it's up to you guys to create those algorithms. Also planning, you know how i'm going to navigate to a particular point given to understand where things are and also control how i'm actually going to actually we're going to you know press gas and rotate the wheel. But we're not going to talk about that in class maybe maybe just got the perception right now in terms of perception, what do I actually need to understand on that car. Maybe it's less important about exact material properties, but important their shape right, for example, is not just important to know that there is a car what What if it has a trunk open what it has a door open, I will understand that racer can navigate around it. And then there is also more high level questions you know, can you make a pizza in this room, what does this mean right, we need to have at least an hour one or something like that, so that actually require some reasoning. Okay, so imagine if you need to design an algorithm is going to answer these questions right, you can imagine that this is actually really hard. Alright, so maybe we can talk about you know why should we even start the computer vision, what are the really cool things we can do with it once we we master it. Okay, so when I was a student, you know this kind of Ai robot and it's kind of always inspired me to actually study computer vision, I thought it would be really cool. And how well this car is driving, so this is basically 26 minutes of or driving in this pretty hard you know challenging environments, you have a lot of course it's kind of like maybe not Manhattan which is super urban with a lot of traffic, but it seems pretty hard. You know you're going to say that you want to have a different sky, so you can actually mark the sky over here and replace it with you know, a different kind of sky right so image manipulation is one really nice application computer vision as well. I want to make it look like one gold right Okay, so what I can do, I can give my neural network here in just a picture of you know, some some picture of an artist that I like like here would be painting of one go. And now can stylized this particular photograph to look more like that Van Gogh painting Okay, or some other artists, you know i'm not an expert right, but you can have other artists here the paintings and then you can get you know kind of stylized images out she's put the code. neural style and shot a movie and completely style is, and will read this Ai technology to look like more scary and so actually this technology is being used by you know really users real artists already she's awesome. That is very simple computer vision that you can use over here okay and we're going to do that, for one of the assignments in class you guys are going to be pasting some texts like this onto images. much harder is, if you guys watch, you know American football where where there's also our tracking all the players and understanding how much they run how many passes they do that's much harder but that's also done pretty well these days it's a good technology. Data here that you were only showing faces, of course, it also works and other types of objects for cars bedrooms you know it's kind of up to you on what kind of imagery you train it on okay. Okay, why is this super important well it's important for many things, one of them is you know, imagine you want to build a system for blind people they don't see what's in front of them. Right, so you maybe want to have a camera and algorithm is going to narrate you know, be careful, this is, you know, this is what on the road so that's one use case the other use cases retrieval right like what Google is doing. But it's quite incredible what they've done is they, they basically crawl the web, for I don't know hundred 200 million images and text right, because when you guys posting what pages are posting. All right, anything like this really complicated images which are called composited rubber baby daikon radish even know what that means is walking a dog it kind of looks good.