

Mobile Computing
Professor Pushpendra Singh
Indraprastha Institute of Information Technology Delhi
Lecture 17

Hello everyone! Today we will look how to add icons to the different widgets that we have added to an application. As you have used many android applications you may have noticed that applications which have icons usually look more beautiful and appealing to the end user. We have already created a simple math quiz applications which had 3 buttons. Today let us look into theory and practice of how to add icons to widgets such as the button.

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If you want to add an icon, uh that is an image to display it on a button you will have to first put this as a resource in your android studio project file. As you know that your android studio project file already has a folder res. Now, you have two choice, inside the res there is already a folder called drawable, so you can either put your icon images directly under drawer or within the drawerable you can keep folders which correspond to different pixel density of the android devices that are available. So, you may want to create folders such as drawable/hdpi, mdpi, xhdpi and xxhdpi.

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The mdpi stands for medium density screen, around 160 dpi, hdpi stands for high density screen around 240 dpi, the xhdpi stands for extra high density screen around 320 dpi and xxhdpi stands for extra extra high density screen 480 dpi. There is also xxxhdpi and this also ldpi which I am not mentioning here. Moreover here I will only tell you how to add an icon. Creating icon is altogether a different task and comes under designing. You may want to create icon yourself or you may want to use an image that is available on the web for the license that allows you to use it. Here we will try to see how to create a very simple icon ourselves without having any resources and how to just use an icon which is available on the internet for our program. However if you plan to make commercial applications please make sure that whatever images you are using you own them that is, their copyright and licensing is with you. So, now let us go into our program and see what we need to do to add an icon.

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One more thing, when you have added various icon images, the operating system chooses the best image file for the device running the app from the available ones. If an app runs on a device with the screen density that you have not included android will automatically scale the

available image to the appropriate size. You may be tempted to provide images for all sizes or you may be tempted to provide only one image. There is a trade-off here, the more images you provide better you control on how your app looks; however your app increases with each image that you provide. And if you provide only let us say a few high resolution images then you do not exactly know how they will look on a device with lower resolution you leave it to the OS to decide for it. Now let us go into our program and try to see how do we add an icon image to one of our buttons.

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As you see this is our quiz activity ok. Let us start with our application one more time. Let me just run it to refresh your memory. I am running the app from the log messages you can see the app has been created, started and in resume mode. Now I can press the button, I can get an output, another output, I can go to next and everything is working. Today our task is to add icons to these buttons and to see the whole process of how do we do it. Let us start working on that right away.

As you will see that here this drawable folder in your project, currently the drawable has nothing. Similarly if you go to your layout file, activity quiz but XML it is a very simple file which is only displaying the text, right now let us go back. We have again 2 choices, either we can create different other sub drawable folders with respect to different densities or we may just want to put our images right here only. I will start with just putting images right here. For this purpose I have downloaded 2 images from the internet and I have got 2 images from the authors of the book Big Nerd Ranch Guide.

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Let us use those images to see how we can add icons to our widgets. These are these 4 images, I will copy them and I put it to my project directory, I paste these images here. The image arrow left and arrow right are provided by the authors of the book Big Nerd Ranch Guide while images T-down and T-up that stands for thumbs down and thumbs up are available on the internet.

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Let me just quickly tell you how to search images on the internet, you may have already done that multiple times but I am trying to show you what could be a right way to do. I always use png search engine for this purpose. Let us say I want to use an image called thumbs up png I

type it, go to images the most important thing that I can see is that what kind of license these images are available with. Currently you are seeing a lot of images. Please not that anything that you create is your property similarly these images are property of the people who created them and you cannot use these images without their exquisite permission or without paying them a suitable license fee. However, some people make their images available for free to use. This information is available in the license here and I want to look for the images which are free to modify here and use commercially. For my own application, I may actually use any of these images and use only for such purposes I just go for all creative common images.

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But because I (am) want to show you the way to how to find images so that you can use without any fear of violating intellectual property rights, let us search only for them which is free to modify or share and use commercially. This is a reasonably good approach to find the images on the internet which may be free to use commercially. However if you do want to make it commercial application you must contact the creator of this image and take the permission exquisitely. So, from here as you can see, I copied this image and similarly I typed thumbs down and I copied this image. This is the copy that I was showing you available to me and which we will use in our program. As you can see that these are lot bigger than the images provided by the authors of the book which seem to be of the right size.

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Now anyway, today our aim is to add the image and then we can see what we can do with the images of different sizes. Let's go to the program and now you see that initially my drawable folder was empty, but now my drawable folder has the 4 images. Now what I want to do is that I want to add those images in these buttons. Go as you see that I am seeing different choices drawable left, bottom, end, padding, right, start and various other things. I want to draw it one image on the left and one image on the right. Let me just choose drawable left and for that I will first use my arrow left image.

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Similarly, for the next button I want to use drawable right and I want to do arrow right. I save it, go to design and have you seen that our application now has images corresponding to these buttons. Let me run the applications so that you can see it, you can see that the small image that was provided by the authors fits very nicely with the button. Now, these images would

have made more sense if we had a previous button here and next button. But the intent was but the idea of this class was to teach you how to add the icons which we have clearly seen.

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Now, let us go back and try to add the images that we have downloaded. I will go here I will set T-up and say T-down. As I said Oh! My image seems to be too big and let us see. Well it is so big that it destroys the whole UI. Now, let us try to make this image little bit smaller and then none again. On Windows, I have a very nice tool just called 'Paint' and it is available. So, let me first also check what is the size of the image provided by the, ok so the size of the image that has been provided is 15 by 22 pixels. I will try to create my images of the same size, so I bring my image in; do the resize I go to the pixel and my current image is actually around 400 times of the image provided by the authors of the book. Let me call it 15, do not want to maintain aspect ratio, I will do 22 and there it is. My image is now very small obviously it is not looking any good.

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Let me make the size small but maintain the aspect ratio or just make it 22 by 22. Yes, that looks better. Let me go back, as you see I will now open another, I will also do resize, I will do 22/22. I will save that one too. If you are on a line axis stump you can use 'jump' for the same. In fact 'jump' is also available for Windows and it is much better image generator. But for this small purpose, even paint has good work. Now, let us go back, save everything, was hoping to change and let's see what happens. Oh! Wow! Now our application has reasonably good icons this time. There are many problems with the images that you download. For example, they do not have a transparent background that is why you are seeing this clear outline. So, if you are trying to make a commercial application, please invest sometime designing the icons yourself or better get it download by a design. Anyway you have seen that how do we add an icon to a **to a** widgets purchased buttons and you have also seen how to make it accessible in your program by changing XML file and then referring to the resource from the XML file.

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Now, let us see the another way of adding an icon where we would like to create separate directories for (sep) **for different screen tixel** for different screen pixel densities in our program. So, I go to the res again, I create a new directory and I call it drawable/hdpi copy my 4 items here. Please note that the purpose of this exercise is only to show you how to

create apps which have icons for different pixel densities. For this particular example we do not really have icon which are of different pixel densities, so we will be using the same icons. I can now delete my drawable directory, similarly I can create another directory for let us say drawable/mdpi or you gave it for sdpi and I will just copy the same images into mdpi.

Please note that when you create these different directories you are copying all the images of the icons across all the directories. Essentially you are creating icons of different pixel densities and you are presenting them in all the different directories. So, in our case the copies exactly same, but in real application case the name will be same but the pixel density of each item will be different as per the directory structure. Now, let us go back to our programme and see that if we need to make any changes in our lay out file, does not seem so,

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I can run my programme again and fine my app is fine. So, at one time the android will automatically take the right icon file depending on the screen pixel density of the actual device that we are using. Now, let us see very quickly how to create your own icon files for your simple application. For such purposes I use nothing but the Microsoft paint in program, what Microsoft print gives me is a way to create a small png images myself.

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Let us say I wanted to create my own left icon image, I could have just created it like this. Make it fit, do the resize and save it. Let us save this is left and that is it I have created my own icon; this will not look very good but it is ok for my own application. However if I want to go for a commercial application I actually get this icons designed by actual designers. In that way you own the copy right, you own the license and you can also see how your application uses beautiful icons which you have designed. Today we learned all about adding icons to the widgets.

Thank you.