

Mobile Application Development Project

CB.EN.U4CSE21008

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As part of the Mobile Application Development course at Amrita School of Computing, we developed *GenderID:Hand-Based Recognition*, an AI-powered app focused on predicting the gender of an individual from the image of their hand. The app is designed to assist within the Forensic Science domain, specifically in Biometric analysis.

Our project utilizes the 11kHands dataset to train several deep learning models, including MLP, base CNN and CNN with 9 layers. Testing revealed that CNN with 9 layers provided the highest accuracy at 91.82%, followed closely by base-CNN at 81.33% and MLP at 75.21%. The dataset can be accessed here: <https://sites.google.com/view/11khands>.

For a demonstration of the app in action, <https://youtu.be/1YiNrMJjRoo>. We've included a [<https://i.imgur.com/GKiwsF0.png>, <https://i.imgur.com/BpzGchL.png>] to outline the core structure and workflow of *GenderID*.

The complete source code for *GenderID* is open-source and available on GitHub: <https://github.com/Ashrockzzz2003/DeriveFromHand>

##11kHands ## Amrita School of Computing

Script

Hi everyone, I'm Ashwin Narayanan S, a 4th year B Tech Computer Science and Engineering student studying in Amrita Vishwa Vidyapeetham, Coimbatore. As part of our Mobile Application and Development course we developed GenderID, a revolutionary app that can predict the gender of an individual from their hand's image. In forensic science, identifying the gender of an individual can be crucial especially when only the individual's hand is available as a proof. GenderID offers a solution using advanced deep learning techniques with CNN by accurately analyzing hand images to accurately predict gender in real time. One important aspect of the app is all of the ML happens on device and no internet is required to make the predictions. Everything happens locally on device. All this was made possible using our mobile application development course.

So now, let's see it in action. We'll capture a hand image and watch as GenderID predicts the gender in real time. I take an image of an hand that I already have and as you can see, on the top bar it says "It's a male hand". Next, say we take an image of a female and show the same to the app, now the prediction gets updated in real time. That was the demo of the app.

One another notable feature of the app is, once every 60 frames the image is processed, resized as per the model's needs and fed into the model locally on device powered by Google's LiteRT and the prediction is generated which gets updated in the UI. The source code of the app is entirely publicly available on GitHub which contains the source code of both the model training and the Android app. That's about the app. Thank you for an amazing opportunity to build this app through the Mobile Application development course and I'd also like to thank Guru Prakash sir, our faculty who motivated us to do this project. Thank you!

