

Android ML: TensorFlow Lite & Object Detection

Learn to build Android apps with Kotlin and integrate custom-trained TensorFlow Lite models for real-time object detection.

5 Days

DURATION

13

MODULES

66

TOPICS

COURSE OVERVIEW

This course begins with Kotlin programming fundamentals and the Android Studio environment before covering user interface construction with views and widgets such as progress bars, pickers and rating bars. It then moves into machine learning integration, covering data annotation, dataset collection and management, and using TensorFlow Lite with Google Colab for model training. Learners work through setting up training notebooks, training and evaluating custom object detection models, converting them to TensorFlow Lite format, and implementing real-time object detection with live camera feed in an Android app. The course closes with advanced object detection models such as EfficientDet, SSD MobileNet and YOLO, and comparing their performance on Android.

WHO THIS COURSE IS FOR

Android Developers

Mobile App Developers

Machine Learning Engineers

Data Annotators

Computer Vision Engineers

LEARNING OBJECTIVES

- Write Android applications using Kotlin syntax and control structures
- Build user interfaces with views, layouts and widgets
- Apply data annotation techniques to prepare training datasets
- Organise, store and version-control datasets for model training
- Configure and train custom object detection models with TensorFlow
- Evaluate and optimise model performance for mobile deployment
- Convert trained models into TensorFlow Lite format
- Implement real-time object detection using a live camera feed

13 Modules, 66 Topics

PART 1 Introduction to Android App Basics

2 days

01

Introduction to Kotlin

TOPICS

- Kotlin History
- Kotlin Advantages
- Creating a Kotlin Program
- Running a Kotlin Program
- The main () function
- Kotlin variables
- Kotlin Data Types
- **Control Flow Statements:** IF, IF-Else, When Statement
- **Loops:** For, While, Do-While
- Jump Expression
- Functions
- Objecting Oriented Programming
- Class
- Kotlin collections
- **Kotlin coroutine:** Async Programming

02

Android Framework and Android Studio

TOPICS

- Android Platform Architecture
- Android Libraries
- Components of Android Application
- Overview of Android installation
- Installing Android Studio with Compose support
- Creation Kotlin Project using Android Studio
- Run Android App
- Setup and Android Device
- Run application on Hardware Device

03

Creating User Interface

TOPICS

- Introduction
- Android Project Structure
- View
- Adding a View to your application
- Adding a View in an XML layout file
- Adding a View using Kotlin code
- Configuring Layout Views
- Creating a User Interface
- Adding a Text Box
- Adding an Image
- Adding a Check Box
- Adding a Radio Button

04

Android Widgets

TOPICS

- Progress Bar
- Seek Bar
- Date and Time Picker Dialogs
- Creating a Date Picker
- Creating a Time Picker
- Calendar View
- Web View
- Rating Bar
- Video View
- Texture View

PART 2

Integration of ML with Android App

3 days

05

Data Annotation Basics

TOPICS

Importance of data annotation · Annotation techniques and tools · Hands-on practice with data annotation

06

Dataset Collection and Management

TOPICS

Strategies for dataset collection · Organizing and storing datasets · Version control and export formats

07

Introduction to TensorFlow Lite and Google Colab

TOPICS

- Overview of TensorFlow Lite
- Introduction to Google Colab for model training

08

Model Training Notebook and Uploading Dataset

TOPICS

Setting up a training notebook · Uploading annotated dataset for training

09

Training Custom Object Detection Model

TOPICS

- Configuring training parameters
- Training object detection model using TensorFlow

10

Model Evaluation and Optimization

TOPICS

Evaluating model performance · Optimizing model for mobile deployment

11

Converting Object Detection Model Into TensorFlow Lite

TOPICS

- Converting trained model to TensorFlow Lite format
- Model optimization techniques

12

Real-time Object Detection in Android

TOPICS

- Implementing real-time object detection in Android
- Integration with live camera feed

13

Advanced Techniques and Model Comparison

TOPICS

- Exploring advanced object detection models (EfficientDet, SSD MobileNet, YOLO)
- Comparative analysis of model performance on Android platform

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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