

# Creating Teaching Material on Integrating Remote Data Sources in Android Apps

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Connecting to REST APIs within Android apps has become an essential skill for developers. This thesis presents the development of comprehensive teaching materials designed to instruct on integrating REST APIs into Android applications. Through careful evaluation, Retrofit emerged as the most suitable library for this purpose. Additionally, crucial topics such as authentication and authorization are reviewed.

## Introduction

The Smart Device Programming course, taught by Prof. Dr. U. Fiedler as part of the Distributed Systems and IoT specialization, provides a foundation in Android app programming. Currently, the course lacks materials on how to connect to remote data sources using REST APIs. Modern mobile apps often integrate remote data from REST APIs, making this an important topic to include.

To address this, students should learn how to find and select an appropriate library such as Retrofit and be provided with best practices related to this topic, including authentication and authorization. After research, this thesis created teaching materials for a new course sequence on integrating REST APIs, updating the course to reflect a more modern approach.

## Approach

First, we evaluated and researched which HttpClient library is most adequate for this course. In the subsequent evaluation of the various libraries, attention was paid to the maturity level, licenses, and compatibility. During the evaluation, Retrofit emerged as the most suitable library. The teaching materials were then developed based on the research. This includes lecture slides, a demonstration app for code-alongs, exercises, and exam questions, developed with con-

sideration of Bloom's taxonomy to effectively classify these questions.

To test whether the teaching materials and the teaching concept proved their worth, a test lesson was carried out with students. After this test lesson, feedback was collected from the students.

## Results

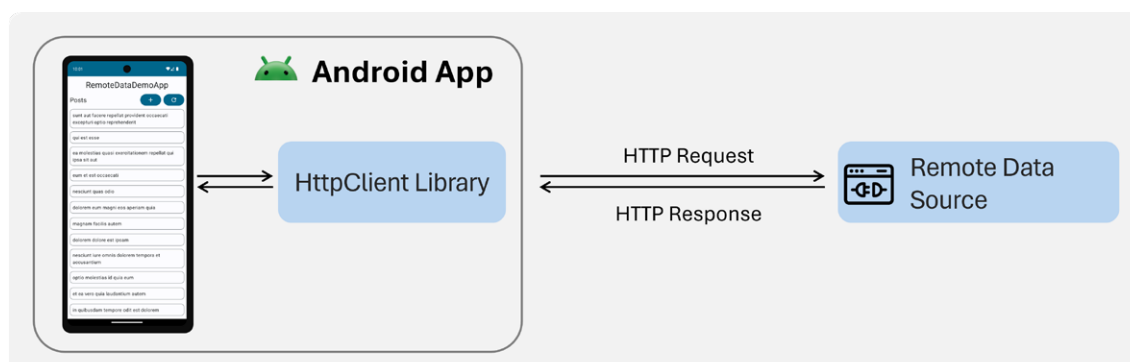
The developed teaching material covers topics related to the integration of Retrofit. It also demonstrates possible authentication and authorization methods and includes a guide for evaluating an appropriate library for a software project.

Based on the feedback from the test lesson, the materials were revised and improved. For example, more theory slides were added to a topic to clarify it better for students. Additionally, summaries were provided after each subtopic and not only at the end of the teaching sequence.

In general, the test lesson was well-received by the students. They appreciated the balanced mix of theory and practice and the structure of the teaching sequence. The approach of following short theoretical blocks with practical application examples on the same topic was particularly well-liked. The developed teaching materials will be used in the Smart Device Programming course and Special Week 3.



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The teaching sequence aims to show students how to access a remote data source using an Android app and an HttpClient library