Ein Bild, das Grafiken, Grafikdesign, Clipart, Schrift enthält.

Automatisch generierte BeschreibungDIY Manual D2R

This manual refers only to the D2R (Digital to Real) part of the Chameleon Scope project. For the R2D you find a separate manual in the repository.

# Required components

* ESP32 NodeMCU Module WROOM32
* Adafruit 1.14” 249X135 Color TFT Display
* Durovis Essentials Lens Set 2 (37mm) - 2 biconvex PMMA lenses for Virtual Reality Headsets
* EEMB Lithium Polymer Battery 3,7 V 250mAh 502030 rechargeable Lipo battery with JST connection for VXI Blue Parrott
* VUNIVERSUM 10 Pairs 2.0 PH 2Pin Premium Mini Micro JST jack incl. 15cm 26AWG silicon LiPo battery charger cable
* Aokoda CXT-405 4 CH USB 1S LiPo/LiHV Charger JST-PH 2,0 mm mCPX
* Semitransparent glass: VORCOOL Head Up Display (as projection surface)
* 3D printer and PLA filament (TPU also works) for the case
* 2 Clamps to fix the case to your chosen glasses (you should use [this ones](https://www.amazon.de/Dioche-Leselicht-Brillenlampe-Angelger%C3%A4t-Wartung/dp/B07JHQP385/ref=sr_1_29?keywords=lampe+f%C3%BCr+brille&qid=1680602316&sr=8-29) and remove the light spots, if you don’t want to modify the case)

# How to mount D2R part of Chameleon Scope

Ein Bild, das Text, Diagramm, parallel, Screenshot enthält.

Automatisch generierte Beschreibung

# Architecture

# Ein Bild, das Text, Screenshot, Diagramm, parallel enthält. Automatisch generierte Beschreibung

# Functionality

We planned to implement the following functionality:

* Select videos from local file system of your smartphone and stream them on display of Chameleon Scope, maybe even stream other videos you play on your device (like YouTube etc.).
* Show information like time, weather dates, push notifications, incoming calls and battery level in display of Chameleon Scope. In the menu of your smartphone app you can navigate to a functionality page, where you can activate or deactivate this general info.
* Interaction with retrieved data from R2D module, like the name of a person that has been recognized by face detection.
* More to come, for example AR games…

# Outstanding problems

## Video streaming

By now you can only choose a video from your local file system. Streaming of other videos is not implemented yet. We also have the problem that the streamed videos do not run fluently, as a result of the algorithm, that converts videos into single frames, then discards every second frame, and the remained ones get split into chunks to send them via UInt8List to the web socket server on ESP32. These steps are necessary, because memory of ESP32 is not able to handle larger data streams. Furthermore there is no audio output, because you have to split the same way you split the video and after that you give it to smartphone audio output. Until now, we didn’t find a way to solve this problems.

## Basic Information

The information activated on your smartphone app are not displayed on display. The functionality page is only a mockup. Only reaction to push notifications is implemented.

## AR Games

We didn’t start developing AR game enablement…

# Code assignments

You can find the Arduino Sketch for D2R ESP32 in the repository by following the path ***Chameleon\_Scope\_App/ESP\_D2R/esp32websocket\_d2r.ino***

The flutter app parts of D2R you can find by following the following paths

* ***Chameleon\_Scope\_App/flutter\_code/VideoWidget.dart*** for video streaming page
* ***Chameleon\_Scope\_App/flutter\_code/websocket\_service.dart*** for functionality of sending video streams
* ***Chameleon\_Scope\_App/FunctionSettingsWidget.dart*** for functionality settings page
* ***Chameleon\_Scope\_App/notification\_service.dart*** for streaming push notifications