# Pictostick

## Introduction

Care givers, parents and health care professionals of people with a mental disability and/or an Autism spectrum disorder (ASD), or simply autism, often make use of pictograms to give people a clearer understanding of the world around them.

One of the biggest advantages of using pictograms (or pictos) is that in one easy to grasp visual form the activities and their sequence that are planned for the day ahead are presented. This provides understanding and prevents stress and miscommunication.

a typical picto board

Often the pictos are presented on a board on the wall (as in picture above) or simply on a wooden plank (as in picture below) on which the pictos are added (or even removed during the day) showing the activities and the order in which these take place. While this low tech way often works fine in practice it is not portable and often only used in either the users' household or the (work) places during the day.

a typical picto plank

## Pictostick

The pictostick offers a method to present a scrollable sequence of pictos for the user in a portable way, either as a small device that can be carried around or a watch-like option with a wrist band. The pictostick can be refered to by the user as to the daily activities and even to check off the ones that have allready been completed.

## Hardware

- M5 StickC Plus2, a low-cost, small form factor ESP32 Mini IoT Development Kit. It has a 1.14-inch TFT screen with a resolution of 135x240 pixels and a battery capacity of 200mAh. (https://shop.m5stack.com/products/m5stickc-plus2-esp32-mini-iot-development-kit)
- M5-Watch wristband for M5 StickC Plus2 (optional)

Future possibly bigger device/screen.

## Software

The code for the pictostick is Free/Open Source software made available under the Creative Commons Zero v1.0 Universal License at https://github.com/jsoeterbroek/pictostick Github repository.

## Picto Icons

The picto icons used are Google Fonts Material Design icons, made available under the Apache License Version 2.0 license.

(https://fonts.google.com/icons)

### Missing pictos

- brush teeth

### Pictos that could improved

- dinner.png

## Configuration

### Conceptual

A caregiver or parent of the pictostick user configures the picto's on the device in a correct time-based order and updates the device via a Web Browser interface over WiFi.

### Technical

The configuration of the Pictostick device is provided on a per device/user basis via a JSON configuration file which is located on the device file system /data directory called data.json. An update mechanism for providing the device with a new and/or updated configuration file via HTTP is in the repository picto_ws directory, together with a sample data.json file to be used as a starting point.

## WiFi

The pictostick device is connected to the outside world via WiFi. This is needed for periodical time synchronisation of the devices' internal clock with a public Internet NTP clock server. Secondly, the WiFi connection is needed to allow for caregivers and/or parents

of the device user to remotely configure the device and specifically the picto sequences stored on the device for the specific user.

### WiFi secure credentials

The WiFi secure credentials of the care-giver or parent of the user are not initially stored on the device or in the software code. On first startup of the Pictostick device these secure credentials configuration data can be programmed into the device via a Web browser and a temporary WiFI network between he device and the user.

See the Documentation for specific details of this procedure.

Documentation Link: procedure_wifi.md TODO

## TODO

- screen for config and/or time/date, battery info bigger that the top bar on main screen
- configurable options for user (eg. color themes)
- code formatting

### battery saving stuff

- sleep mode after x seconds inactivity
- turn of WiFi when not needed
- backlight dimming by user

### Attribution

Special thanks to VolosR (https://github.com/VolosR) for many, many code examples and ideas, some of which are used in this project. I could not have finished this project without his youtube videos and code examples. By him a coffee: https://ko-fi.com/volosprojects