BACHELOR PAPER

Thesis submitted in fulfillment of the requirements for the degree of Bachelor of Science in Engineering at the University of Applied Sciences Technikum Wien - Degree Program Electronics and Business Distance Study (BEW-DL)

Wireless Button for FABI

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Munich, 13.02.2025

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Abstract

**Schlagwörter:** Puck.js, Raspberry Pi Pico W, FABI, Assistive Technologies

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Acknowledgements

**Keywords:** Puck.js, Raspberry Pi Pico W, FABI, Assistive Technologies

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# Introduction

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Figure 1: Example of name and year printed on spine (Source).

Below there is a cross-reference to Table 1. The table format shown here serves as an example only. Tables may be formatted individually.

Tabelle 1: Schedule for “Applied Mathematics” (Quelle).

|  |  |  |
| --- | --- | --- |
| **Date** | **Subject** | **Room** |
| **20. 08. 2008** | Graph Theory | HS 3.13 |
| **01. 10. 2008** | Biomathematics | HS 1.05 |

This is a cross-reference to Equation (1):

|  |  |
| --- | --- |
|  | (1) |

Bibliography references should be automated especially when there is a long list of books. This is a sample reference to sources [1] and [2]. The style of citation and the Bibliography format used here is one of several possible ways, depending on the discipline and the functionality of the word processor.

# State of the Art

## Hardware

### Raspberry Pi Pico W

### Raspberry Pi Pico W 2

### Arduino Nano RP 2040 Connect

### Puck.js

## Software

### Earle Philhower Core

### BLE

### WIFI

# Requirements

## Required Hardware

## User Interface

## Connection of Puck.js

## Button Presses

# Design

### Hardware

### Software

# Implementation

## Raspberry Pico W

### Setup

### Wifi User Interface

### BLE

### Button Mapping

### Key Presses

### Main Loop

## Arduino Nano RP 2040 Connect

### Setup

### Wifi User Interface

### BLE

### Button Mapping

### Key Presses

### Main Loop

# Evaluation

## Test

## Limitations

### One Button vs Multiple Buttons

Multiple bottons are supported on the Arduino, but not on the Raspi

### Wifi vs BLE

Chip does not support both at the same time.

### USB HID vs BLE Periperal

If the Puck.js shall be connected via BLE, then the computer cannot be connected via BLE, as the Raspberry can be either LE Central or LE Peripheral

# Results and Discussion

## Comparing the requirements

### Required Hardware

### User Interface

### Connection of Puck.js

### Button Presses

## Discussing Future Work

# Conclusion

Bibliography

[1] P. Scherz and S. Monk, “Practical electronics for inventors,” 2016, *McGraw-Hill*.

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[Table 1: Schedule for “Applied Mathematics”. 6](#_Toc330300577)

List of Abbreviations

|  |  |
| --- | --- |
| WWW | World Wide Web |
|  |  |
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|  |  |

Documentation table of AI-based tools

|  |  |  |
| --- | --- | --- |
| **AI-based tools** | **Intended use** | **Prompt, source, page, paragraph...** |
| **DeepL Translate** | Translation of an article in English | Source (XXX), Chapter X on page X-X |
| **ChatGPT (4.0)** | Grammar and spelling | "Please list issues with spelling and grammar in the following text: ..." Entire document |
|  |  |  |

Appendix A: Code for Puck.js

Appendix B: Code for Raspberry Pico W

Appendix C: Code for Arduino Nano RP 2040 Connect

Appendix D: Code for Puck.js (for the Connection with Arduino Nano RP2040 Connect)