Hochschule
Kaiserslautern
University of
Applied Sciences

# R-ZWEI KICKERS

— Code Release 2024 —

R-ZWEI Kickers:
Adrian Müller (Scientific Lead, Professoral Supervision),
Wilhelm Simus(Captain, Dev),
Thomas Jäger (LeadDev, ScrumMaster),
Philipp Stopp (Mitarbeiter abat+, Sponsor),
Desmond Krämer (Dev, Support),
Samuel Njike(Student, Support),
Emmanuel Nzeuwokeng(Student, Support)

most recent changes: October 7, 2024

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# 1 Introduction

## 1.1 About the team

We're a (usually) mixed team of vocational students, university students, professors and industrial partners that was founded in 2020 and has since participated in various competitions and challenges, with our most recent achievement being 2nd place in the RoboCup SPL world championship in the challenge shield division.

### 1.1.1 History / Achievements

**2020** After branching off of B-Human's 2019 code release in 2020 we couldn't compete in a competition that same year, since the competition got canceled due to the pandemic.

**2021**

**2022**

**2023**

**2024**

## 1.2 Members and Supporters

### 1.2.1 Current Members

- Adrian Müller (Professor of Computer Science): Hybrid AI, Project Lead
- Wilhelm Simus (Digital Engineering, 4th Semester): Technical Support, Behavior Programming, Teach-In
- Thomas Jäger (M.Sc. Media Informatics): Strategic Programming (a.k.a Robot Trainer), Soccer Consultant, Lead Developer, Teach-In
- Philipp Stopp (Technical/Commercial Consulting, Employee at abat+ (our main sponsor)): Content transfer to Industry4.0 and other AI projects
- Desmond Krämer (Applied Computer Sciences, 7th Semester): Behavior Development, Robot Deployment
- Samuel Njike (Applied Computer Sciences, 2nd Semester): Behavior Development, Teach-In (Data Analysis)
- Emmanuel Nzeuwokeng (Digital Engineering, 3rd Semester): Whistle Detection Optimization
- Nicolas Fortune (Applied Computer Sciences, 6th Semester): (Inter-)Robot Communication

### 1.2.2 Former Members / Supporters

- Andreas Hobelsberger (Applied Computer Science): Simulation Development, Behavior Development
- Asfiya Aazim (Exchange Student, University of Bangladesh): Behavior Development (Goalie Dive), Robot Deployment
- Mohamed Asrar (Exchange Student, University of Bangladesh): Behavior Development, Robot Deployment
- Nishay Anand (Exchange Student, University of Bangladesh): Technical Support, Robot Deployment
- Connor Lismore (Applied Computer Science): Image Recognition
- David Kostka (Applied Computer Sciences): Image Recognition
- Jannis Schottler (Applied Computer Sciences): RobCup Junior League World Champion

- Jonas Lambing (Vocational School Kaiserslautern): Behavior Development, Robot Deployment
- Markus Dauth (Master Computer Science): Agile Testing, Optimization
- Mike Hindi (Applied Computer Sciences): Image Recognition
- Felix Mayer (Applied Computer Sciences): Teach-In, Optimization of Controls

## 1.3 Structure of the Document

## 1.4 Major Changes since 2021

# 2 Getting Started with B-Human's Codebase

## 2.1 Setting up the work environment

### 2.1.1 Windows 10

This OS is soon to be deprecated, still most our Develop-machines are building the software using this OS.

**CMake** B-Human's software is built using a CMake-pipeline. Installing CMake is therefore essential

**Git** Version Control in our software is managed using Git.

**Visual Studio 2019** We're currently working using the VS2019 Community edition IDE. However, this IDE has recently been replaced by the 2022 variant and downloads of the former version can no longer be accessed. How to setup the newer version has to properly be researched, but I think it's analogous to the previous version.

**WSL** Windows Subsystem Linux is necessary for building some parts of the code.

**VSCode** This IDE can alternatively be used for building the code on WSL, the subsystem OS. However, we've not been able to do so on every machine so far. A proper Howto has to be researched and documented.

### 2.1.2 Windows 11

Basically this is almost the same as Windows 10. Because of design changes in the OS some things do not look like they did back then. Also the gtest-library fails when building on this OS for some machines. This library tests the correct implementations of macros by BHuman ... We're currently investigating how to fix this.

### 2.1.3 Linux Ubuntu 20.02

The tools to be installed are similar to those on Windows. However you don't have to find most first but can just use one sudo apt install script to list most.

### 2.1.4 Linux Ubuntu 22.04

Same as Ubuntu 20, but some things (e.g. gtest-library) do not work right away.

## 2.2 Using the simulator environment SimRobot

## 2.3 Deploying software on the NAO robots

### 2.3.1 Deployment via the BHuman User Shell(BUSH)

### 2.3.2 Deployment using a USB-Flasher