

EduExo 2.0 Specification

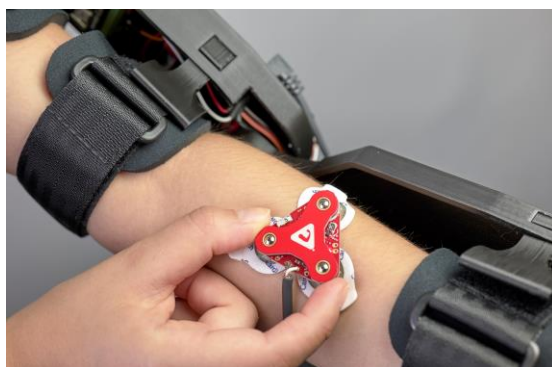
The EduExo enables students, hobbyists and teachers, to learn and teach about exoskeleton technology. The do-it-yourself kit contains all parts and components you need to assemble an elbow exoskeleton. In addition, a comprehensive handbook teaches theoretical knowledge and contains a manual on how to assemble the hardware, design basic controllers, and how to use the exoskeleton as an input device for a self-made video game.



Language	English
Arm	Left and right configuration possible
Dimensions (packed)	26 cm x 22 cm x 8 cm
Micro controller	Arduino Nano
Motor	Digital servomotor with up to 0.6 Nm and position feedback
Muscle activity sensor	Myoware electromyography sensor 2.0 with jack connector 3.5 mm
List price	€290 without taxes

Learning With The EduExo

The EduExo allows anyone to obtain basic knowledge about robotic exoskeletons. It is suited to be used at home by individuals, but can also facilitate teaching in schools and universities. You will learn about topics ranging from hardware design, electronics, to control theory and game design. The handbook contains all the information you need to assemble the exoskeleton and program basic control strategies.



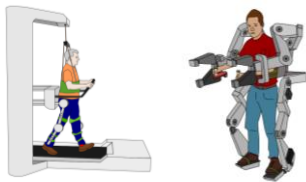
Handbook



The handbook has seven main chapters that will introduce you to many aspects of robotic exoskeletons and their technology. The chapters start with the necessary theoretical background, followed by a set of tutorials that can be implemented with the EduExo hardware.

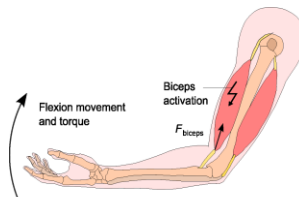
1. Introduction

The first chapter introduces the field of robotic exoskeletons. A look at exoskeleton history, examples of existing systems, and their applications.



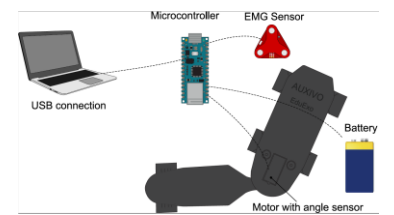
2. Anatomy and Mechanics

The third chapter covers the basics of human functional anatomy and exoskeleton mechanics. Here it gets hands-on with a tutorial on the assembly of the EduExo.



3. Electronics

This chapter teaches the basic electronics knowledge and skills needed to safely connect all electronic parts of the EduExo.



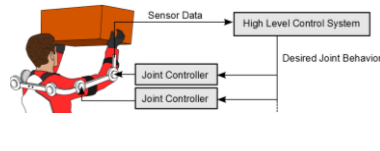
4. Software

This chapter covers the software that turns the mechanical exoskeleton into a robotic exoskeleton. It contains source code examples for all exoskeleton core functions.



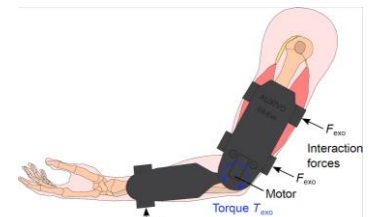
5. Control Systems

In chapter seven, control systems are discussed. Different controllers that define the exoskeleton-user interaction are introduced. Step-by-step we discuss, implement, and test them.



6. Advanced Control Systems

The most important task of the control system is to provide support when needed. To do so, the user's movement intention is valuable information. It can be estimated using muscle activity.



7. Virtual Reality & Video Games

Virtual realities and video games are well-established methods in use with exoskeletons. They are, for example, used to increase motivation in patients that use exoskeletons for rehabilitation, e.g., after a stroke.

