TechSportiv – Constructing Tangibles for Sports

Abstract
The TechSportiv-Construction Kit combines digital fabrication and sports. It comprises Arduino technology including a graphical programming language as well as a didactical concept on how to enable (young) people to construct their own technological gadgets. In this workshop we want to prototype artifacts that are related to body movement and that provide feedback on it. This hands-on workshop was originally designed for young people and is suitable for everybody who is interested in the topic.

Author Keywords
DIY; prototyping; construction kit; programming; sports; exercise

Introduction
Today, people track their movements in different ways: phones, watches and bracelets are used to track GPS routes, steps, or general activity. More and more systems appear on the market that mostly quantify movement or activity of people in their leisure time.

Looking from a DIY perspective, it is a lot more interesting to let people create their own sports gadgets. That way, people can meet their own needs and interests in body related data and sports gadgets become more diverse and suit more movements. Applying DIY to sports may also offer another entry
point to “making” by adding a new field of interest, or, it might be interesting for those who are already makers and look out for new projects.

The TechSportiv-Construction Kit

The TechSportiv-Construction Kit was designed in a participatory design process with young people. It is a composition of learning materials and an appropriate environment in which it is applied. It includes hardware like Arduino UNO / LilyPad, sensors and switches such as flexsensors, accelerometers, tilt switches, and actuators like LEDs or beepers (see figure 1). Further, a graphical programming environment is part of the kit, which has been developed for novice programmers (see figure 2). It also allows to continue programming using the Arduino programming language.

Further the TechSportiv-Construction Kit includes crafting materials and an environment in which it is applied. These play a minor role in this short-term workshop.

About the workshop

Who is it for?
The workshop is for everybody who is interested in DIY and sports due to:
- personal interests for own body movement and DIY
- educational interests (school teachers, readers, other educators)
- research interests

What happens?
In the workshop participants develop own prototypes that are meant to capture body movement and to provide feedback on it. This process includes finding an idea what to build, getting to know the technology, prototyping and programming the artifact and presenting it at the end to the others.

Working should be done in teams of two people with a maximum of eight participants. The workshop is held by two experienced tutors who provide help when needed. No programming skills or any prior knowledge is needed.

What is needed?
To run the workshop we need a room for ten people with chairs, tables, a whiteboard or flipchart, and a projector. Laptop computers and hardware are provided.
**About the workshop facilitators**

**Nadine Dittert** is a computer scientist working in the research group of digital media in education (dimeb) at the University of Bremen / Germany. She is responsible for the concept, development, planning and implementation of workshops with tangible technology. Meanwhile she has conducted more than 40 workshops for varying target groups like children, students and adults in working processes. The TechSportiv-Construction Kit is part of her dissertation that will be finished soon.

**Eva-Sophie Katterfeldt** (M.Sc. Digital Media) has been working as research associate at dimeb for more than six years. She was involved in the development of the EduWear toolkit and Amici IDE and has run more than 20 workshops for children and beginners with Arduino and other digital fabrication technologies so far.

![Figure 2: The programming environment Amici](image)