



Tech*K*reativ

Workshops

Technology · Creativity · Education

For current events see:
www.techkreativ.de

program

TechKreativ stands for a unique kind of workshops

Handling technology creatively and discovering new ways of learning and of shaping technology proactively: This is what we invite various target groups to do in our wide range of workshops. One target group we focus on particularly comprises children and adolescents.

This booklet provides an overview of our current range of Tech-Kreativ activities, which we have conceptualized based on the experience gained in numerous workshops we conducted.



The “Digital Media in Education” research group (dimeb), which is affiliated with the Centre for Computing and Communication Technologies (TZI), consists of an interdisciplinary team of committed scientists. Within the field of computer science, we work, teach and research on digital media and their application in the context of education.

In the dimeb research group our aim is to make current developments in the field of digital media accessible to everyone. The opportunity to actively shape technology is an empowering experience as it makes it very tangible that one's actions make a difference. Thus, it promotes an understanding of current developments in modern society.



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Robots can swim and find treasures hidden under water.



We are constructing a penguin that checks whether the light in the fridge really does switch off.

4



We are constructing, tinkering, connecting, using electricity, checking, programming, asking for help, helping one another, are amazed, are modifying our plans...

The participants' imagination is the starting point for the development of project ideas.

What does a light sensor do? Catchy experiments with digital media foster concrete ideas.

Concept development and construction: The young inventors start develop their very own plan.

A public presentation in front of the press, their parents, friends and others promotes a feeling of recognition and motivates the participants.

Steps towards innovation - the concept

Our approach includes incorporating the potential of every child in the joint work. To this end, our TechKreativ team undergoes special training. Our workshop participants receive individual support and attention as well as tailor-made advice. They work together in small project teams. From the first project idea all the way to its practical implementation, these project teams are accompanied by our professional TechKreativ team. In an environment that encourages constructive learning, technological wonders come into existence, such as robots, smart clothes and many more.

concept

concept



We shall show, what we can achieve!

concept





Overview

Steps towards innovation - the concept

Workshops on offer:

Wearables - wearable intelligence

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Imprint

There is an exciting topic for every target group

Story-telling robots, smart clothes, the Bremen Innovation Camp, SmartDance and RoboCupJunior only represent a selection of our activities on offer. At your request, we conceptualize workshops, the topics and structure which are tailored specifically to your school class, your co-workers or your trainees. Please see the *your personal workshop* chapter at the end of this booklet for further information.

We offer a broad variety of courses ranging from teaser courses of 2-3 days and week-long courses to several days' holiday camps including accommodation and 24-hour-care as well as advanced training or disseminator courses of several kinds. We conduct workshops both in the Centre for Interaction with Digital Media (ZIM) at the University of Bremen as well as in nearly any other place offering enough space for creativity to develop.

Our activities for children and adolescents also include visits to relevant cultural organizations and to companies.

The colored columns at the bottom of each page contain information about:

the target group · the duration · the technology employed



and the competence to be gained



Eduwear

Wearables

Wearable intelligence - for clothes, sports and games

Through the EduWear EU project, Smart Textiles have become an important component of the TechKreativ program. As part of this project, a toolkit was developed, which is supposed to make access to Information and Communication Technology easier. In this context young people can actively shape and co-design technologies and learn how to use them in a confident and competent manner.



EduWear – the kit

The kit contains Smart Textiles (for example conductive yarn and fabrics), LEDs, vibrating motors, buzzers, light sensors, heat sensors, motion detectors and a small and handy microcontroller which can be used for the construction of intelligent clothes.



So far, in the field of “Wearables” workshops have covered the following topics:

- Smart Fashion - intelligent clothes for tomorrow made of yesterday's outfits.
- Your Wearable BodyLab! - intelligent accessories, senses and sensors, body and motion.
- SmartDance? - girls, art and technology!
- Pimp your bag! fashionable, pocket-size computer intelligence.
- VIVAtch! control a computer using gestures!

Further suggestions regarding topics are always welcome. Please see *your personal workshop* at the end of this booklet.





Wearables

Feel like dancing and experiencing technology?

**smart
dance** is here!

Combining technology with dance is the core of this offer. A choreographer and the TechKreativ team develop a dance performance together with the children and adolescents participating.

The children and adolescents program sensors that enable them to adapt the illumination on stage according to the choreography performed. Programmable LED in the dancers' costumes serve as a means of expression and communication.



Suddenly, creatures appear out of the dark, gleam and glitter for a few moments and disappear just as suddenly. Seemingly by chance, a button is pressed, and the stage is flooded in bright light. Light sensors react to the choreography and the rhythm of the dancers seems to be transferred to everything around them!

In January 2007, our 'SmartDance - Girls, art and technology!' workshop was awarded the title of one of the "365 Landmarks of Ideas" by the "Germany - Land of Ideas" initiative and Deutsche Bank.



The public presentation took place in the Theatre Hall of the University of Bremen. Performances can be conducted at traditional dance locations in Bremen as well as in the context of international conferences.





Robots make dreams come true!

VIVA Robot! Robots, dreams and adventures

Technology allows us to explore worlds which otherwise would not be accessible to human beings: Robots can move in these places, stay for a while and collect data. In medicine, for instance, these small and big helpers are employed in order to explore the body. They also explore the submarine world, carry out hard work and also save people trapped in buildings.

In our VIVARobot! workshops we make the interplay of form, function, material, design and algorithm come to life.



Phenomena of everyday life are being explored!



Previous VIVARobot! workshops have covered the following topics:

- Theatre and technology
- Science fiction: Narrating adventures with robot technology
- Robots tell fairy tells
- Human beings and machines

A tailor-made workshop on a different topic can also be organized, for instance for school classes. Please see page 20 for details.





VIVA Robot! groups from the ZIM

The dimeb research group works with young people in a space that offers plenty of room for them to explore their creativity: the Centre for Interaction with Digital Media (ZIM).

RoboCupJunior

Each and every year, RoboCupJunior proves to be an exciting event. During weekly meetings in the ZIM, a group prepares for the yearly qualification tournament. The participating pupils construct soccer robots, rescue robots and dance robots. RoboCupJunior is the junior league of the international RoboCup. The central idea is to bring across how much fun technology can be and to develop robots through team work.

Expert group

In addition to the children that prepare for the RoboCup competitions, there is an "expert group". Children and adolescents that have participated in a TechKreativ workshop and have expressed a strong interest in taking a closer look at these technologies meet once a week. These meetings provide them with an opportunity to test new technologies together with scientists at the ZIM at the University of Bremen. Moreover, in this context, they can develop their project ideas further.



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Bremen Innovation Camp

The Bremen Innovation Camp is a joint project of the University of Bremen, Jacobs University and the Bremen Board of Trade. The first camp, in which the participants also stayed overnight, took place at the Bremen Youth Hostel in autumn 2007.

For one week, children and adolescents worked in teams with scientists from both universities. There they learnt about and experimented with state-of-the-art technology. In the workshops "Humanoid Robots" and "Interactive Fantasy" the participating boys and girls made robots dance and staged their fantasies in a theatre play using Smart Textiles.

**The ic:b 2008**

At the 2008 camp participants could choose between three workshops. At the Bremen Youth Hostel, technology and sports were brought together, and moreover, autonomous and humanoid robots were constructed and programmed by the participants.

Also for the next Bremen Innovation Camp, we are planning to give young people the opportunity to develop new ideas and put them into practice. Every year, the Innovation Show is the grand finale of the camp.

www.innovationscamp.de





TechKreativ professional vocational training and continuing education for companies

In order to fully utilize the creative potential of the diverse range of people, working together in one organization, and in order to promote the overall openness to learning processes and innovation, new approaches are indispensable.

We offer employees of companies the opportunity to experiment with information and communication technologies. In our 2-3 days' workshops, they gain hands-on experience concerning the transforming potential of IT and digital media. Microcontrollers, actuators, sensors and a programming environment are provided with which one's own products and processes can be designed and created.

In everyday work processes, manifold ideas for optimizing products and processes and increasing their quality arise. Our training units offer a space for the prototypical implementation of such ideas.

TechKreativ professional offers the opportunity to:

- implement innovative and creative ideas
- foster technology, communication and team work competencies

TechKreativ professional is offered by the Center for Computing and Communication Technologies' (TZI) Digital Media in Education research group of the University of Bremen.

The workshop series was supported by BIG Bremen in 2008/09, aiming at transferring the expertise gained in workshops in an academic environment to an attractive customer service program.



TechKreativ professional advanced training

Our TechKreativ advanced training units offer an introduction to the robotics materials we use with children and adolescents as well as to the concepts that we developed for their use in schools and other educational institutions. The training units also actively invite discussions during specific review phases. The target group of this advanced training program includes teachers as well as other professionals who are interested in conducting robotic workshops with young people.

The main focus lies on experimenting, trying out one's own ideas and the constructing and programming of robots. Moreover, 'intelligent' pieces of clothing can be designed and produced using SmartTextiles. The advanced training units are being conceptualized and implemented by scientists of the TechKreativ team. These courses do not require any prior knowledge. Usually these courses are recognized and accredited by school administrations as advanced training event for teachers.



TechKreativ Lab Your personal workshop

At your request, we also develop tailor-made concepts aiming at any specific target group, focusing on a topic of your choice or integrating a technology that you take special interest in. Inter-generational workshops in which adults and children designed and constructed SmartTextiles products together have proven to be a positive experience for everyone involved. Usually all these groups are heterogeneous with regards to the age of the participants. Moreover, our didactical approach actively promotes intercultural and gender sensitive work. Tailor-made workshop concepts for schools:

- biology (bats, bees, ants, etc.)
- mathematics (geometry, secret and encrypted languages etc.)
- German language (fairy tales, communication, theater, etc.)
- sports (measurement devices, dance, motion games, etc.)
- computer science (programming, mobile devices etc.)
- physics (collecting and discussing data, etc.)



TechKreativ Lab Interactive installation - The Swarm

A cloud of light spots is projected onto a specific area within a room. When a person steps into this area, an interaction between them and these light points starts instantly. Each movement of the person has an effect on the cloud.

Young and old people can immerse themselves in this world of light spots within the framework of a workshop. By doing so, they can experiment with the accessibility and usability of the technical computer system.

The installation "The Swarm" has emerged from a Bachelor project under the supervision of Prof. Dr. Schelhowe.

What are these spots? Animals? Insects? Why are they running away from me...

Seemingly, this swarm of mysterious creatures can perceive, interpret and respond to the behavior of a person. Many questions arise in the minds of children, which can be ideally integrated into a variety of topics in biology, physics or mathematics lessons. Moreover, "The Swarm" encourages self-awareness, introspection and expressive ways of body awareness.

A permanent publicly accessible installation of "The Swarm" has been set up on the ground floor of the Technical Academy of Bremen (TAB, Am Fallturm 1, 28359 Bremen, Entrance E) by the Mobile Research Center (MRC).

Temporary installations were presented in the Nordwolle Museum in Delmenhorst, at the 2006 RoboCup in Bremen, during the 'Children's Uni' Bremen, in the Ortsamt Obervieland as part of the "Year Of Mathematics", and also in the Kunsthalle Bremen.

The idea, conception and first implementation of "The Swarm" were primarily a product of the work of Marten Schüler and Andreas Wiegand.



Super-Cricket



Bling-Cricket

Handy-Cricket



LilyPad Arduino



SmartTextiles

Lego®-NXT



Lego®-RCX



ROBOLOGO programming environment

technology

materials



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