

# Newsletter

August 2015



## Abstract

In the first newsletter we give an overview of the eHive project. We discuss the motivation and formation of the undertaking as well as ways to participate. Furthermore, we present the BeeBIT team and the fields of action of each member of the team. We conclude by giving an insight at the current state and the future development of the still growing project.

## Dear Reader,

You successfully registered your E-Mail for our newsletter. Thank You!

## What are we trying to achieve?

In the past decade a huge amount of bee colonies collapsed, currently about 40% per year. Scientists have good reasons to fear this development as the honey bee is one of the most important useful animals of our agricultural system. But currently we understand only a small fraction of the bee's biology and behavior which results in a lack of projects to fight death of bee colonies.

With our BeeBIT eHives, we want to establish a tool for professional bee research as well as motivate pupils to engage in bee research.

## What exactly is an eHive?

The root of the BeeBIT Project is the HOBOS Project of the University of Würzburg. The HOBOS System is a special bee hive, monitored by high-tech sensors whose data is published on the Internet. But it is only a single Hive, placed in a narrowly defined geographic and environmental setting. Its data is barely transferable to other colonies in other regions of the world. This is the basic idea of the eHive: A relatively inexpensive system for monitoring bee colonies which can easily be bought and set up by schools and other educational institutions.

Every eHive contains a set of probes: 6 Temperature sensors and a humidity sensor monitor the micro climate of the bee hive. A scale underneath the hive makes it possible to draw conclusions on the colony's honey yield. A proprietary sensor for measuring bee approaches and departures shows the activity of the hive. An industry-standard weather station delivers highly accurate environment data – all those parameters are recorded every minute and can be sent to the server in real-time.

## As an Institution of Education, how to benefit from the project?

The BeeBIT project is funded by the Erasmus-Plus-Program of the European Union to create teaching materials based on the eHive's data. This enables the pupils to work with real, close to reality examples, no matter if in Biology, Math or Computer Science lesson. A sample lesson is available on our homepage. The lessons created during the Erasmus-Plus-Project will be available for free on our homepage. If you created lessons based on our data and want to share it with other schools, feel free to contact us!

Of course, custom projects led by pupils are also possible, which can promote bicultural understanding as pupils can work together across borders.



Fig.1: The eHive at the »Umweltstation« (local conservation agency) in Würzburg.

### **As an Institution of Research, how to benefit?**

As all the eHives are constructed in the same way, the project enables scientists not only to monitor a single colony, but plenty of colonies in totally different regions. Consequently, we collect comparable data that may help to understand the life and death of bees. For example, a colony collapse disorder event was never recorded by sensors – by monitoring several colonies, we may be able to produce such valuable data.

### **How can you participate in the project?**

The best possibility is to buy one of our eHives. The costs vary by configuration and aggregate to around 4000 to 5000 €. For financially weak schools we can offer the possibility to lower the costs. Also, we would be welcome to discuss this with you individually. By buying our eHive your facility or institution will, of course, have complete access to all of our data collected by the systems.

If you do not want to buy an eHive, you have the possibility to access our database separately. In order to pay the expense for the server, we have to charge you with 5 € per month – in return, you will get full access to our raw data and the generated charts as well. The license is valid for your entire institution.

If you are not interested in whether the first nor the second option, you still can help us by using our teaching materials and their free datasets. Or do you know someone who could be interested in our project? If so, just recommend us!

## Our team

The BeeBIT-Project developed on the basis of an A-level course at the Deutschhaus-Gymnasium in Würzburg. In consequence, our team consists of both students or teachers.



**Christian Weiglein**  
Management, biology



**David Schneller**  
Lead software  
engineer



**Jonas Göbel**  
Lead hardware  
engineer



**Jonathan Hofinger**  
Unit tests, public  
relations



**Patrick Günther**  
Micro controller  
development



**Martin Otersen**  
Computer science  
teacher



**Christoph Bauer**  
Biology & chemistry  
teacher



**Norbert Baur**  
Project coordinator

Other members of the team: Anja Waldmann und Patrick Palmetshofer.

## State of the project and future development

Supported by the aid of the European Union, in march 2015 the first 13 eHives have been shipped and installed at schools around all parts of Europe. Until now we work hard on bringing our technical system to perfection. Unfortunately, this is why no data could have been provided to public yet. In the course fall 2015, we are going to make the first sets of data public. Simultaneously, based on this data dedicated teachers will develop the first lessons for education purposes.

With the help of this newsletter we will provide you continuously with updates about the project. In addition, we would be very happy if you keep in touch with us.

The BeeBIT-Team

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