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# The Club

## Who we are

We are a group of robotic enthusiasts coming from different countries all over the world. Our aim is to bring the development of robots further toward usability and have fun while doing it. Our main focus is the development of control software for robots and drones, while using existing and stable hardware. We believe that the control software of the robots still has the biggest potential to bring the functionality and usability of robots and drones to the next level.

## Goals

Our goal is to provide an easy way of using robots that are readily available on the market and use existing control-functions and -algorithms on them. We want to make it possible to quickly start operating a robot by using many of the already developed algorithms without having to get to deep into any programming language, libraries or solving bugs and software dependencies.

We use a radical object oriented architecture shared over possibly many computer using internet protocols. We hereby make sure, that it is easy to reuse and optimize our software and to enable the cooperation of programmers all over the world to independently create modules for our software.

One of the targets is to provide a standard interface and format for software modules in order to use different kind of available objects and plug them together in different ways depending on the robot and the task that is there.

## Equipment

As want our software to work with many different buyable devices, we will try to keep up with the consumer robots and devices that can be freely bought in the market. Currently we work with the following hardware:

#### Bebop Drone:

The Bedop drone is a Quadcopter of a company called Parrot. It is controllable over internet protocol and has some sensors like 2 cameras, tilt-sensors and ultrasonic sensors. We choose to use the device, because it’s easily available (you can buy at every airport shop) and has the possibility to be controlled over the internet protocol.



#### Parrot Drone 2

The Parrot drone 2 is an older model compared to the Bebop Drone. It has a lot of software available to use and is easy to program. There are already many projects from universities and students that use this quadcopter.



#### Sumo Drone:

The sumo drone is a car-like toy that has to wheels and a camera. It is connectable over the internet. The drone is cheap, so we use it for testing in order not to damage our more expensive robots



#### Joystick:

The Hotas Warthog joystick will be used to have an intuitive way of controlling either Debop Drone or Sumo Drones. It is very stable and provides the possibility to make very precise movement (in comparison to control with an iPad for example)



#### Oculus Rift:

The Oculus Rift is a virtual reality head-mounted display developed by Oculus VR. We work with this device to use an intuitive way of seeing what the robot sees. Currently this display is still under development by Oculus. It is expected to be the next thing in entertainment and we believe it will also influence the control of drones.



Devices like iPad, iPhone, Samsong Phones

We use some standard devices like iPad, iPhone, Samsong Phones and Laptops that are used as interface to the user.



# The Control-Software

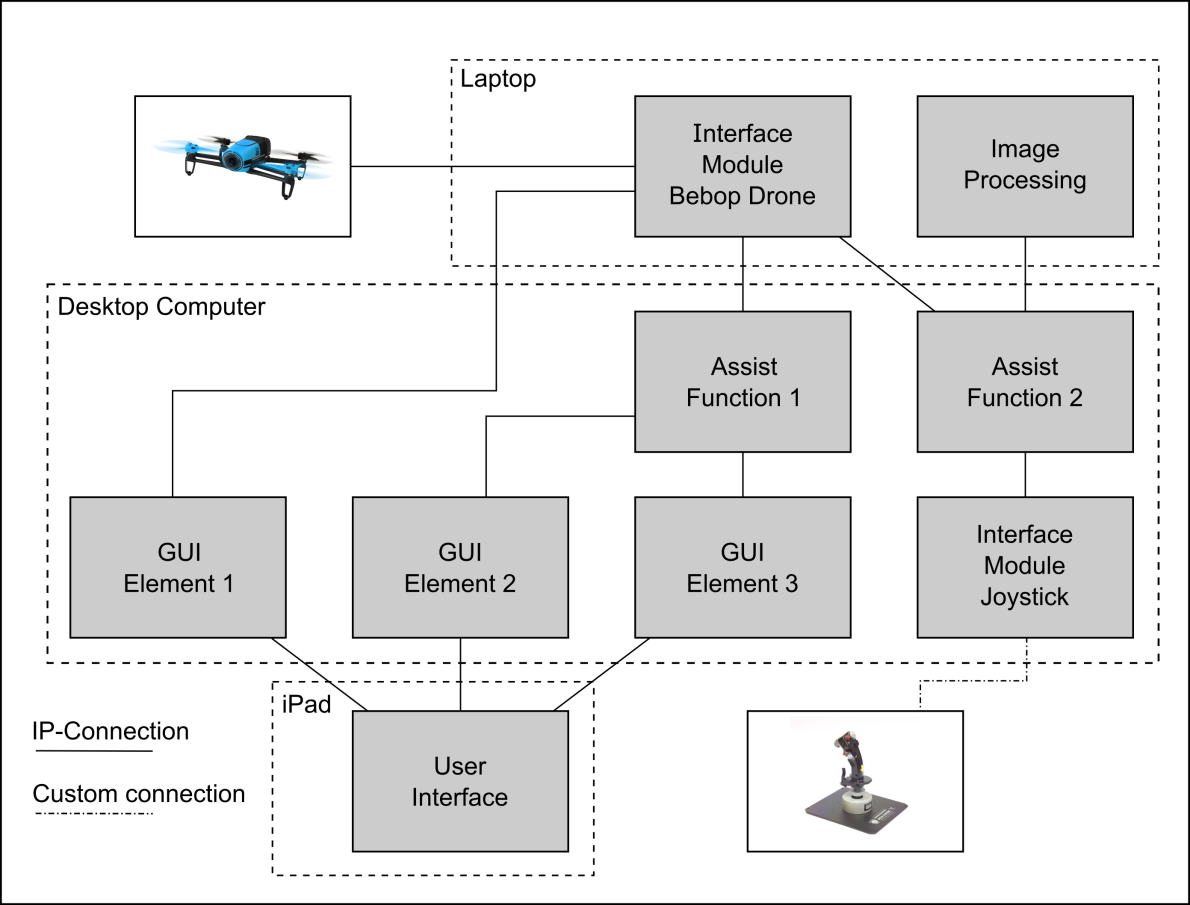
## Structure

The control configuration of a specific robotic application consists of totally independent modules. The connection of the module in between each other is done by different available communications mechanisms like html, udp, streams, telnet, ROS-Communication. I depends on the module which communication technologies are provides, though html is required as minimum requirement. In the future we will define specific interface that or needed and tested to comply to a certain expectation for a module.

There will be different kind of modules. For example:

* Interface modules that provides a standardized interface to the robot, devices, sensors and controllers to send movement commands and receive sensor information
* Libraries modules that provide all kind of algorithms and functions for the other modules to use
* Sensor data processing functions that create new information out of sensor data
* GUI-Functions that make user interaction possible
* Framework modules that create new modules, deletes them and show the GUIs in a definite space

Example of a application to control a quadcopter by coupling existing modules in a certain way:



## Modularity

To make sure that a big and international team can work on a robot system, and that the system is still reliable, the architecture of the software is very modular, even if this means that the speed of the total system would not be at maximum. This decision is made with the idea in mind that in the future computer power will be cheaper and internet/intranet speed will increase.

The modularity also makes it possible to run different modules on different computers with different operating systems. This makes it easier to use existing libraries and algorithms, as only the interfaces needs to be rewritten.

One of our targets is to obtain and provide enough modules, that somebody who want to use a robot just takes the existing modules, does some configuration and plugs them together, without any details knowledge of programming or how the modules work in detail.

In the future we will create a style guide to make sure, that basic functionality and interfaces are provided by the modules (like possibility to debug, make sure that the module is still alive, certain basic user interface elements, etc.). We are also thinking to define some standardized interfaces and provide tests to certify whether a module complies to this interface.

## Current work

Currently we are working to fill the library with the basic modules to create a working robotic system. This library will be expanded with more advanced modules in the future. The basic modules will be tested in different robots and environment to increase the reliability. For current and open project please see the Projects tab.

# Projects

The following projects are currently ongoing or still open.

* Module to control JumpingSumo on Linux (ongoing)
* Module to control Bebop Drone on Linux (ongoing)
* Module to control JumpingSumo on Android (open)
* Module to display a Video Stream (open)
* Module to use a generic Joystick (Windows) (open)
* Module to create a certain configuration of modules (open)
* Module to provide important Vision Algorithms (open)
* Module to send a sequence of commands to the robots (open)

# Downloads

* Under construction

# Jobs

We are always looking for people who are interested in Robotics in general, so please contact us to see how we can cooperate.

#### Students to develop robotic applications

Robotics lab is a group of enthusiasts to provide control software for different kind of robots. Current focus is the easy way of programming driving and flying drones for hobbyist pilots.

We are currently looking for students, who want to be involved in the creation of control modules for mobile robots, like for example Parrot Bebop and JumpingSumo Drones.

We need persons:

* Who are interested or already have experience with robot programming
* Have good knowledge of either C++ or Java
* Have experience either with Linux Windows, Android or iOS programming
* Nice to have: Live in or near Ho Chi Minh City
* Nice to have: Some English skills
* Nice to have: Experience with software development interfaces like for example Image Processing libraries (OpenCV), Internet communication, 3D Programming

We offer:

* Competitive payment
* Possibility to work from home or at room provided
* 20-40+ hrs per week (possible to work while studying)

If you are interested send an email with some detail about your motivation and background to:

[info@robclub.com](mailto:info@robclub.com)

#### C++ Developer

Robotics lab is a group of enthusiasts to provide control software for different kind of robots. Current focus is the easy way of programming driving and flying drones for hobbyist pilots.

We are looking for a C++ developer who wants to be involved in the creation of control modules for mobile robots, like for example Parrot Bebop and JumpingSumo Drones.

We need persons:

* Who are interested and already have experience with robot programming
* Have good knowledge of C++
* Have experience either with Linux and/or Windows
* Nice to have: Live in or near Ho Chi Minh City
* Good English skills
* Experience with standard software development interfaces like for example Boost, Image Processing libraries (OpenCV), Internet communication, 3D Programming

We offer:

* Competitive payment
* Possibility to work from home or at office
* 40+ hrs/week

If you are interested send an email with some detail about your motivation and background to:

[info@robclub.com](mailto:info@robclub.com)

#### App Developer (Android and iOS)

Robotics lab is a group of enthusiasts to provide control software for different kind of robots. Current focus is the easy way of programming driving and flying drones for hobbyist pilots.

We are looking for an App Developer who wants to be involved in the creation of control modules for mobile robots, like for example Parrot Bebop and JumpingSumo Drones.

We need persons:

* Who are interested and already have experience with robot programming
* Have good knowledge of C++/C# and/or Java
* Have experience either with Android and/or iOS
* Nice to have: Live in or near Ho Chi Minh City
* Good English skills
* Experience with standard software development interfaces like for example Boost, Image Processing libraries (OpenCV), Internet communication, 3D Programming

We offer:

* Competitive payment
* Possibility to work from home or at office
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If you are interested send an email with some detail about your motivation and background to:

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