



ArduSmartPilot Project – High Tech Engineering for young Students

Convert a simple toy plane to a motorized aircraft equipped with various sensors and control it with a self-programmed mobile app: This clearly sounds like absolute Rocket Science.

But is it not: We have proved that 16 year old students will meet this challenge: Starting with the integration of electromechanical components and ending with programming the software of a microcontroller and of a mobile device.

All this is done using mainly open source soft- and hardware with costs of less than 60 € for the complete aircraft.

The steam engines of our fathers changed to complex mechatronic systems such as automated manufacturing lines or modern automobiles.

Our grandfathers used to play with model steam engines - the mainstream technology of their time.

The ArduSmartPilot project makes today's children familiar with up to date mechatronic systems: The students use an Arduino, Servos, an electric motor and further electronics to transform a simple toy plane into an intelligent electromechanical system. They also make their own remote control using their mobile devices: The appropriate app is programmed using Processing in Android Mode and the Ketai library.

The mechanical basis of the ArduSmartPilot is a toy glider named "Felix80" of the German manufacturer Miniprop.

The heart of the ArduSmartPilot is an Arduino Pro Mini. This is equipped with a Bluetooth transceiver to communicate with an Android mobile device. The Arduino controls the elevator and rudder of the aircraft as well as the electric motor for the propeller. Further it receives the airplanes sensor data and monitors the wireless connection plus the battery status.

Dealing with the ArduSmartPilot the young Students learn the core fields of mechatronics teaching: Mechanics, drives, sensors, embedded systems, electronics, computer science and communication technology.

They create software, build electronic circuits, design mechanical parts, build kinematics and integrate all these components into a functional system, that they will fly by their selves at the end of the project.

The low components costs and the Arduino/Processing platform made it possible for us to run this ambitious project.

For me as a teacher it was sad to see how the students used their mobile devices in a strong consumer attitude.

The ArduSmartPilot Project helps them to become a maker instead: Now they use a homemade app to control the aircraft and visualize the sensor output.

Please visit our project web sites to learn more about the ArduSmartPilot. You will also find detailed instructions there. Please apologize that currently the documentation is only available in German language.

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Internet Publications:

<http://www.ardusmartpilot.de>

<http://www.heise.de/newsticker/meldung/ArduSmartPilot-Praktischer-Schulunterricht-2112744.html>

<http://hackaday.com/2014/02/14/an-android-controlled-arduino-drone/>

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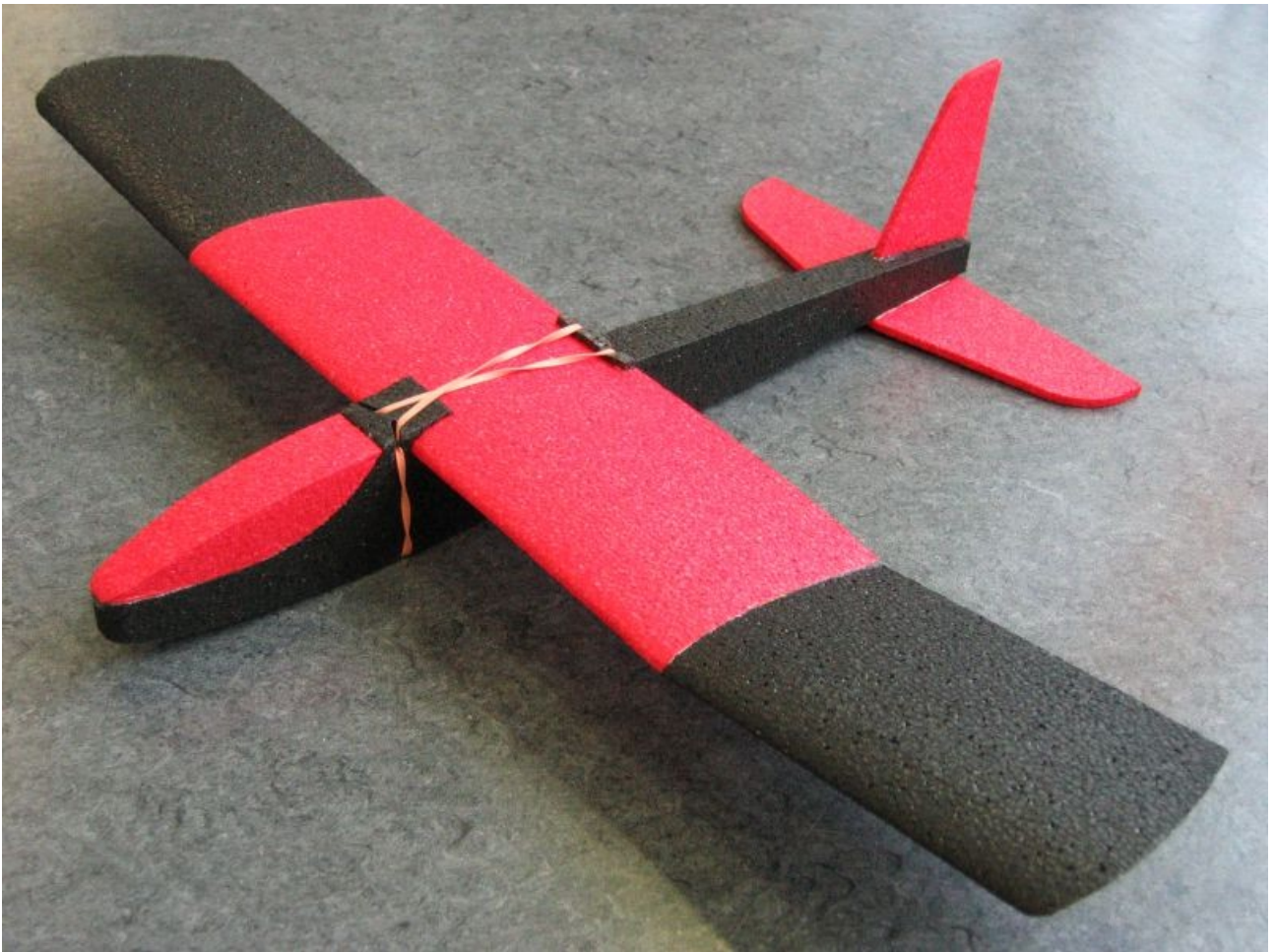
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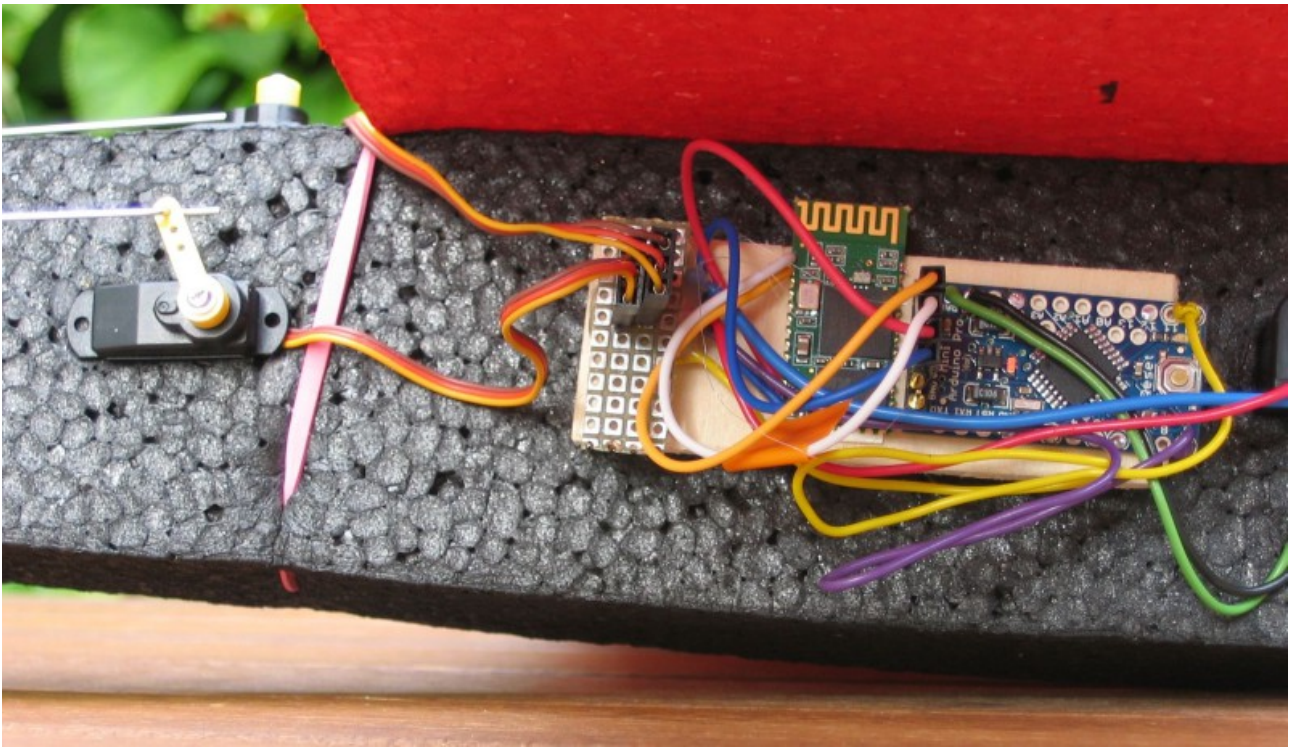
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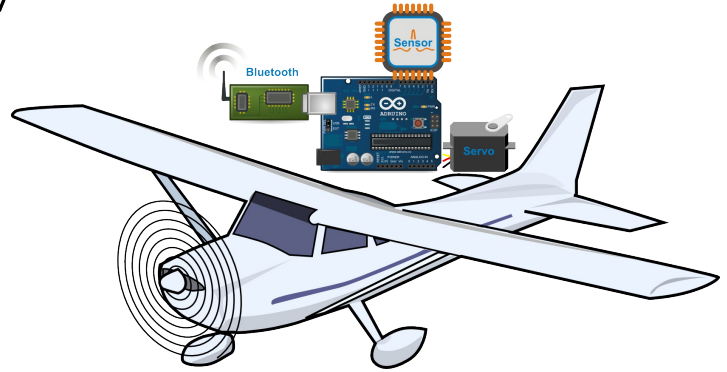


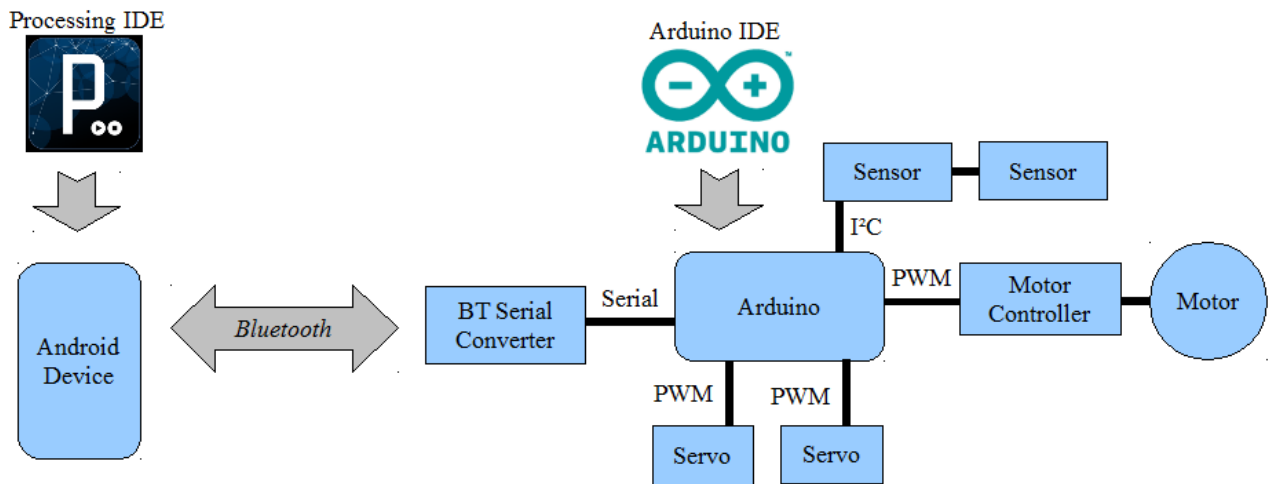


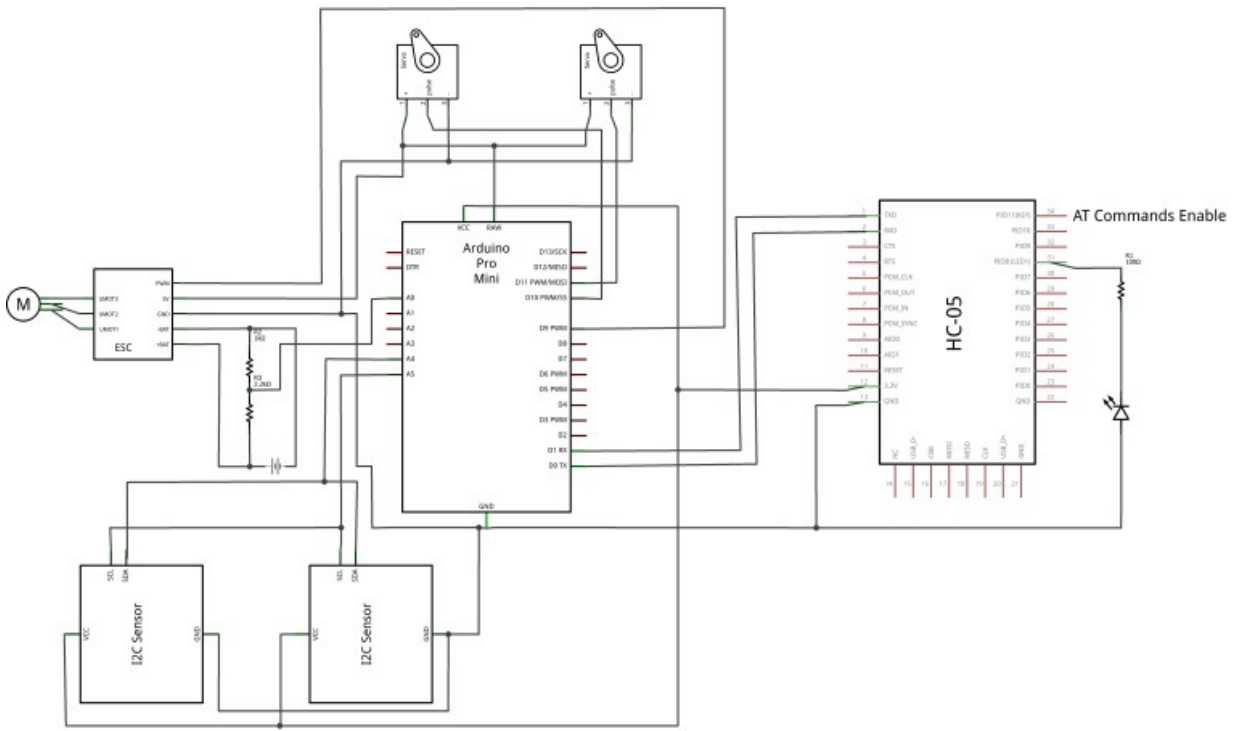


Aeroplane Control

Sensor Data







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