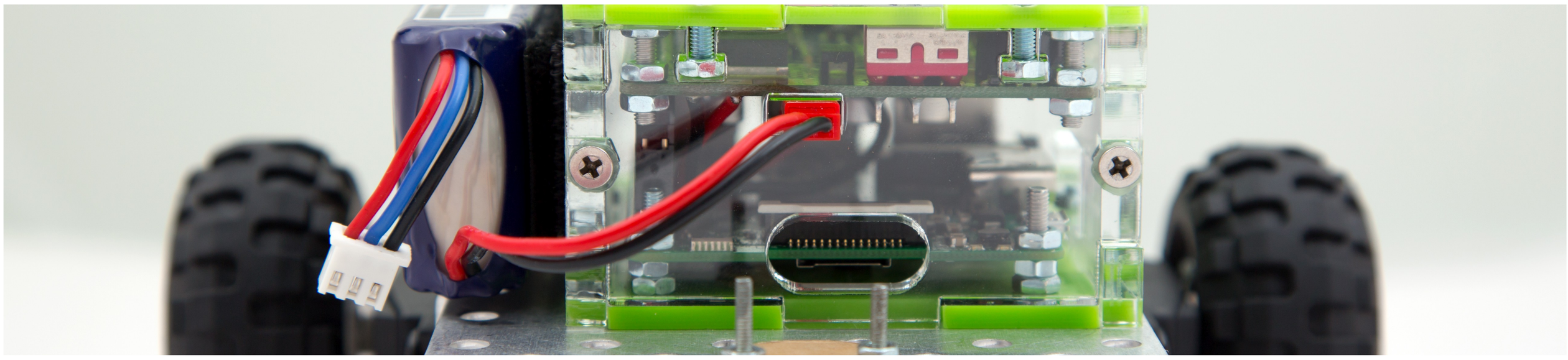


Hedgehog Light

A Versatile, White-Box Educational Robotics Controller

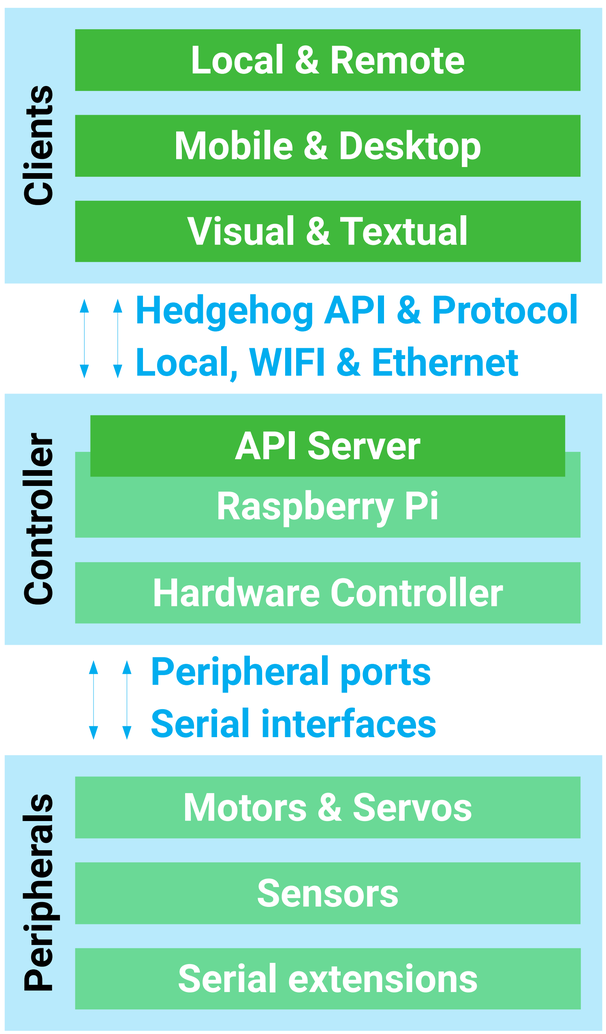
Clemens Koza, Wilfried Lepuschitz, Martin Wolff, Daniel Frank, and Gottfried Koppensteiner

As an organization teaching robotics to groups of different ages and skill levels, we need controllers to support our diverse curricula. However, more systems mean more maintenance and costs. Where possible, reducing platforms is thus desirable.

Hedgehog Light was developed to fit this profile:

- **Visual & textual programming**
- **Simple, but not limiting**
- **Built for the classroom**

Architecture



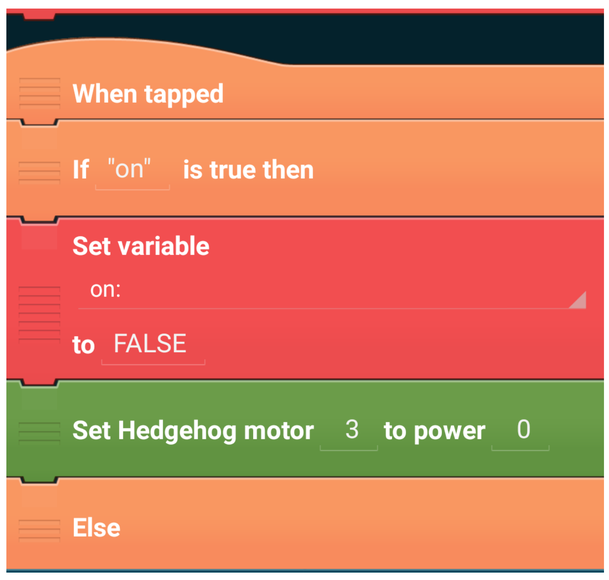
Diverse applications can access Hedgehog using the client API, both locally or via WIFI or Ethernet. A web IDE (under development) is used to create programs **visually** or **textually**.

The Raspberry Pi 3 and hardware controller's **microcontroller** are accessible to users for **extending functionality** beyond command handling and program execution. The web IDE is an example of this.

Peripheral ports include 4 motors and servos, 16 analog or digital sensors, 1 USART interface, and the Pi's 4 USB ports.

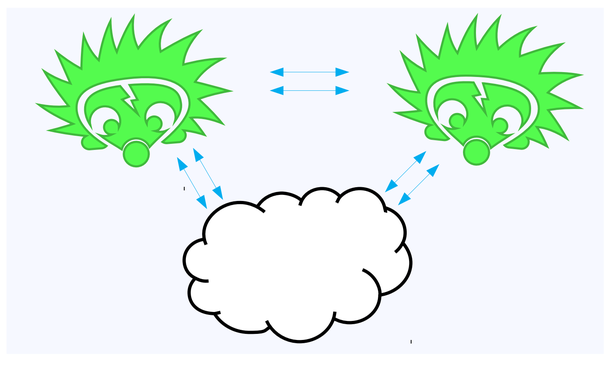
Hedgehog Light is designed for **classroom settings** with **many students** working in parallel.

Use Cases




```
from time import sleep
from hedgehog.client \
  import entry_point

@entry_point()
def main(hedgehog):
    print("drive forward for 1s")
    hedgehog.move(0, 1000)
    hedgehog.move(1, 1000)
    sleep(1)
    hedgehog.move(0, 0)
    hedgehog.move(1, 0)
main()
```



Robots provide quick feedback of what a program does. Through **visual programming**, Hedgehog can be used to teach problem solving skills to young children.

Shown here: **"Pocket Bot"**, an extension of the "Pocket Code" **Android app** with blocks & functions for accessing the Hedgehog controller.

Learning a **textual programming** language in a robotics context has the same educational benefits, but allows for more complex logic. Hedgehog's API is **simple**, but **not limiting**, making the system applicable for both **beginners and advanced curricula**.

Hedgehog works equally with local and remote clients, enabling **distributed applications** without added complexity. The Raspberry Pi brings the **computing power** needed for example in AI projects.

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