An Intensive Introductory Robotics Course Without Prerequisites

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AAAI 2010 Robotics Workshop

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Highly gifted students

First-time programmers (and roboticists!) (and only three weeks)

**Goals**

*Robotics, not programming *per se* “CS1 for Robots”, not “Robots for CS1”*

Large, open-ended projects

Hard, multi-step problems
Flyweight Actuator Interface Library (FLAIL)

Written in Python

Simplicity over exhaustiveness

Not a framework!

Does four things:

- Control an iRobot Create
- Capture images from a USB webcam
- Unbuffered keyboard input
- Simulates a Create

```
from flail import FlailBot, FlailCam, read_key
B = FlailBot()
C = FlailCam()
while True:
    k = read_key()  # Unbuffered read
    if k == 'w':
        B.drive(50, 50)  # Or a distance
    elif k == 's':
        B.stop()
    elif k == 'c':
        I = C.get_image()
        I.show()         # Uses PIL for images.
    else:
        break
```

Hide the hardware, and nothing else
Some Student Projects

On the website:
- Course materials
- More details
- Code!

Adaptation:
- Code
- Well-tested project progression

Ongoing work:
- Course is in its sixth offering
- FLAIL will be used in an undergraduate robotics elective at Duke this fall

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Color Segmentation for navigation

An overhead camera for robot soccer