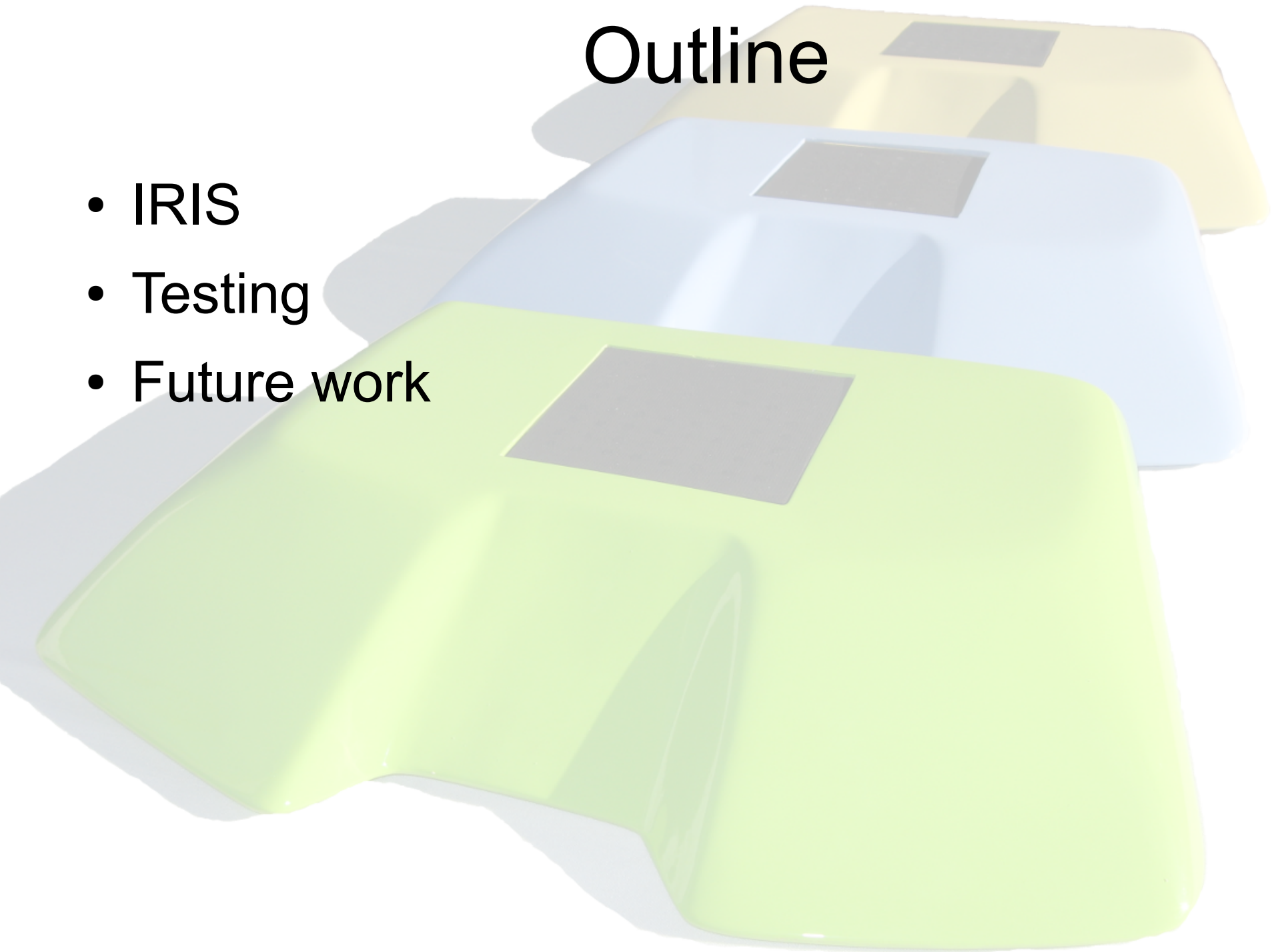# Testing Python applications. A case study

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CS - UMD

Outline

- IRIS
- Testing
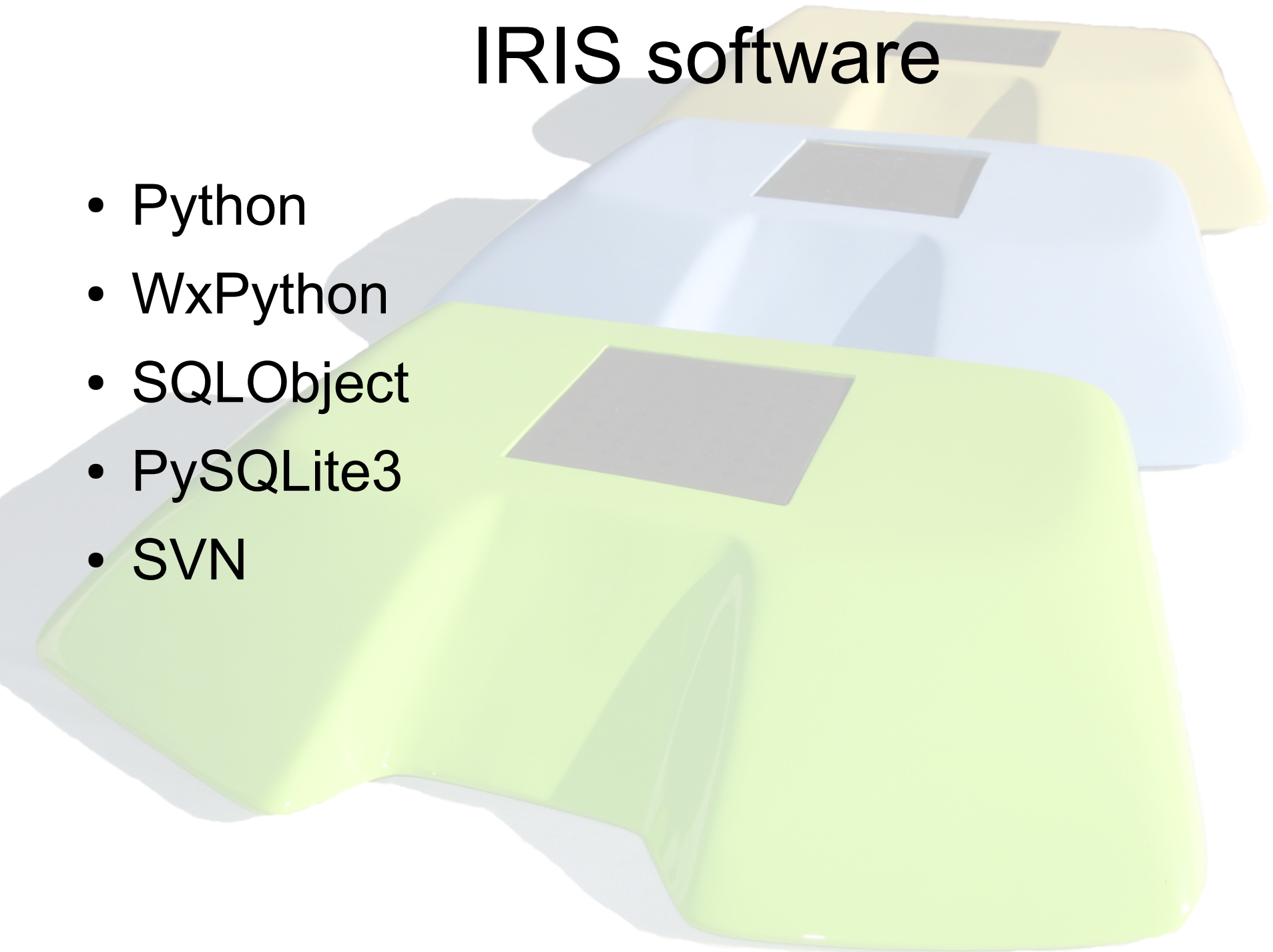- Future work

IRIS In a nutshell

- IRIS is a system that allows blind students to see colors and shapes with their hands
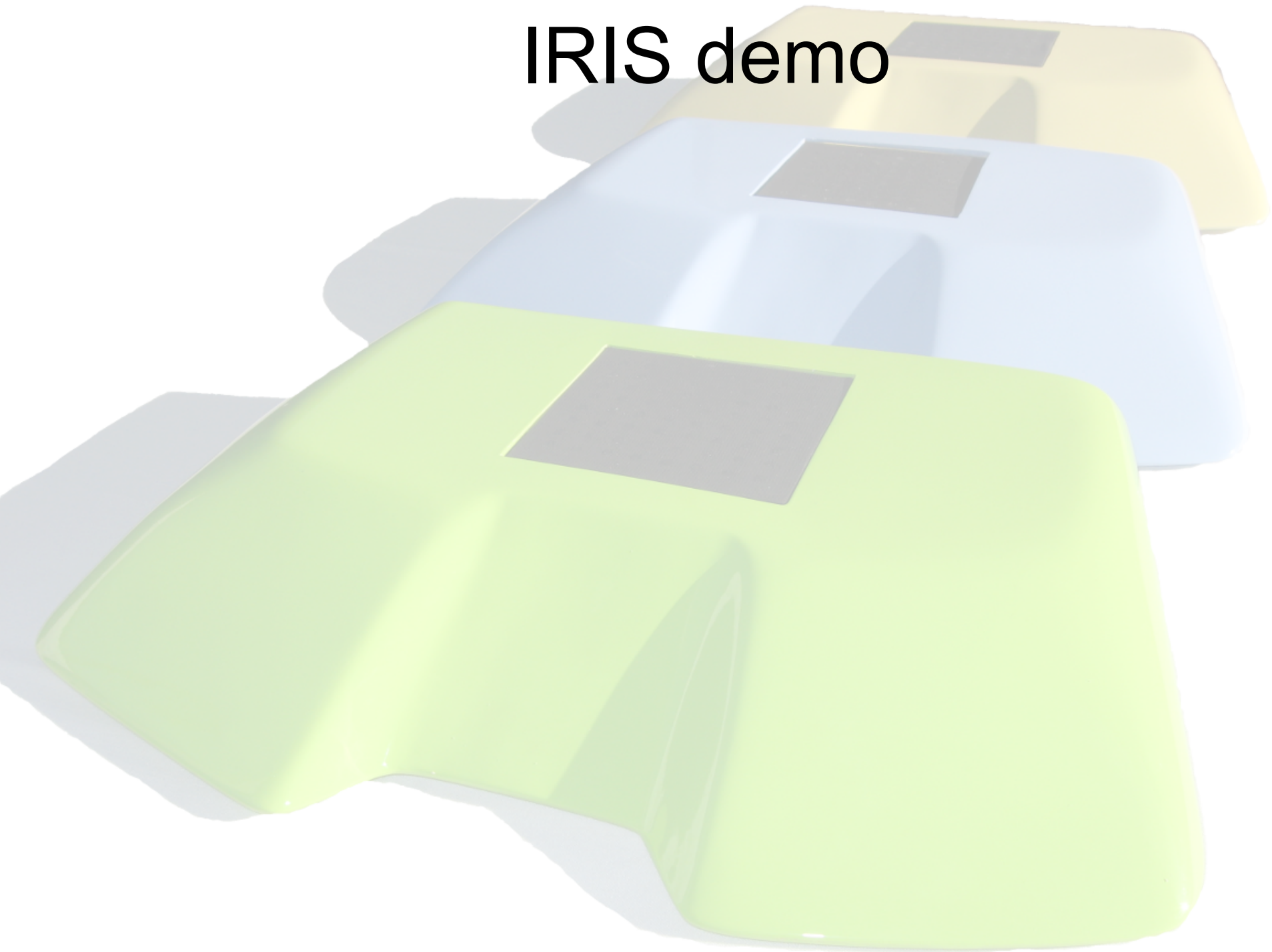
IRIS Architecture

Proyecto IRIS

Dispositivos

IRIS

Todos los colores

Posición: (16, 16)
Zoom: 100.00
Zoom Gráfico
10

Ethernet

IRIS software

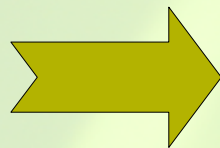- Python
- WxPython
- SQLObject
- PySQLite3
- SVN
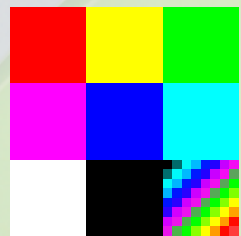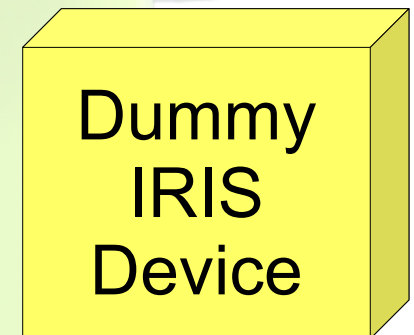
IRIS demo

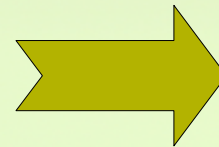# IRIS Abstraction

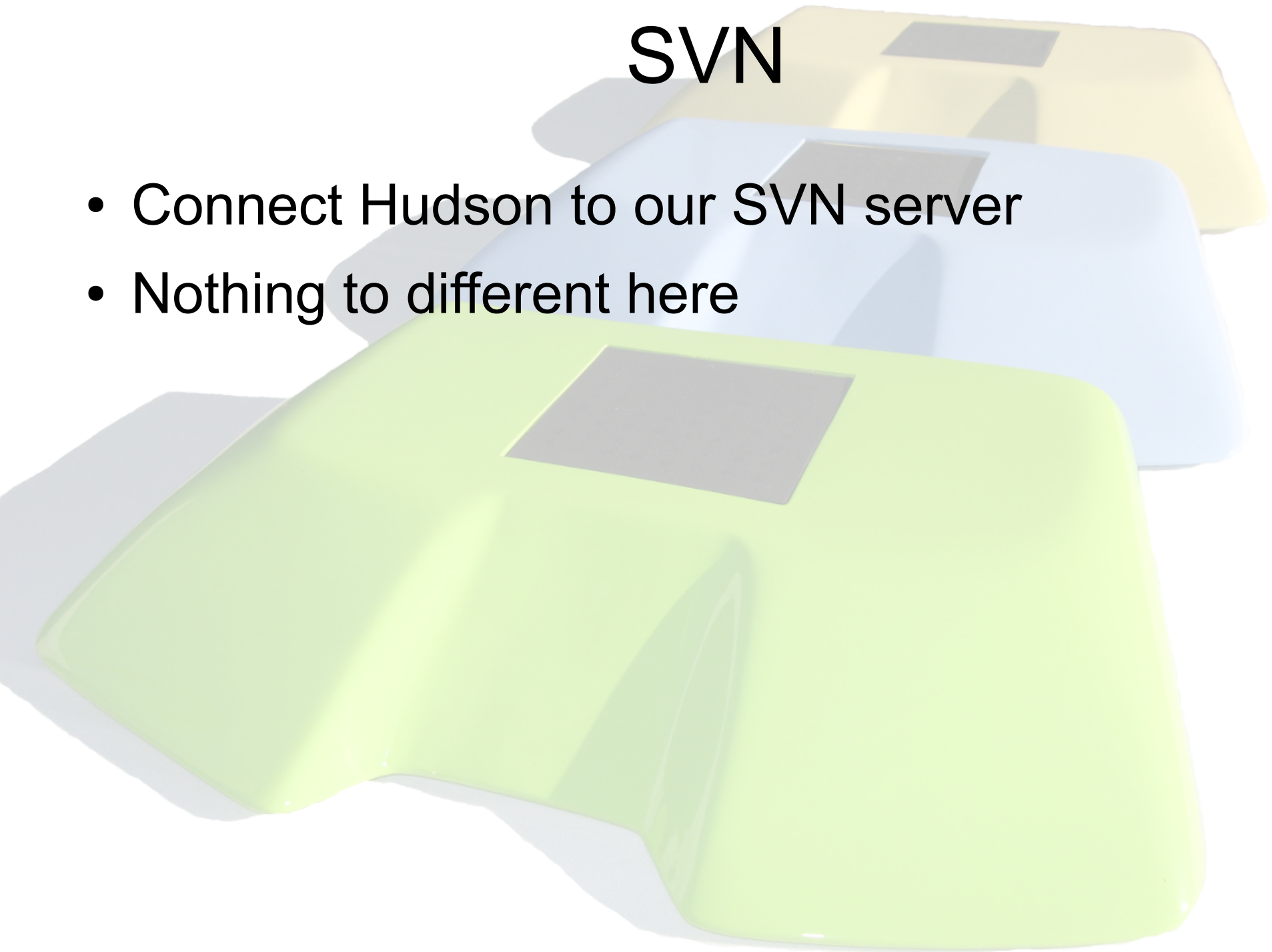- We will not use all the functionalities of IRIS, instead we are going to use it just to codify images.

Hudson Integration

- SVN

- Compiling (Error checking)

- Test Oracle

- Code coverage

- Test cases

SVN

- Connect Hudson to our SVN server
- Nothing to different here

"Compiling"

- Python is an interpreted language
- However it offers a "byte-compilation" to speed up modules loading
  - *.pyc files
- Every time a modified module is imported *.pyc file is generated
  - We use this to check for syntax errors
- python -c "import iris2"
  - We use a small hack to avoid program full execution

Test oracle

- We developed a dummy IRIS device to capture the output of the program.

- Basically a simple threaded socket server dumping everything it receives in a log file.

  - Small demo

Code coverage

- coverage module.
    - http://nedbatchelder.com/code/coverage/
- Installation
    - `easy_install coverage`
- Running it
    - `coverage -x iris2.py image.png`
    - `coverage -b -d htmlconv`

Test cases

- We modified the IRIS code to include just a subset of its functionality, removing the GUI and using mainly the codification process.

- This program receives an image to process and some operations using the command line, then sends the codified image to the default IRIS device.

- We use some of our test images as test cases, and the test oracle dumps the codified images as outputs

Future work

- Static analysis

  - pylint http://www.logilab.org/857

- Calling more IRIS functions from the command line to increase code coverage

- GUITAR type GUI testing

Questions?

Thanks!

More information at:

http://www.duto.org