University of Silesia, WP2 & WP4

Demonstrators, 3d in notebook

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DUBAJ

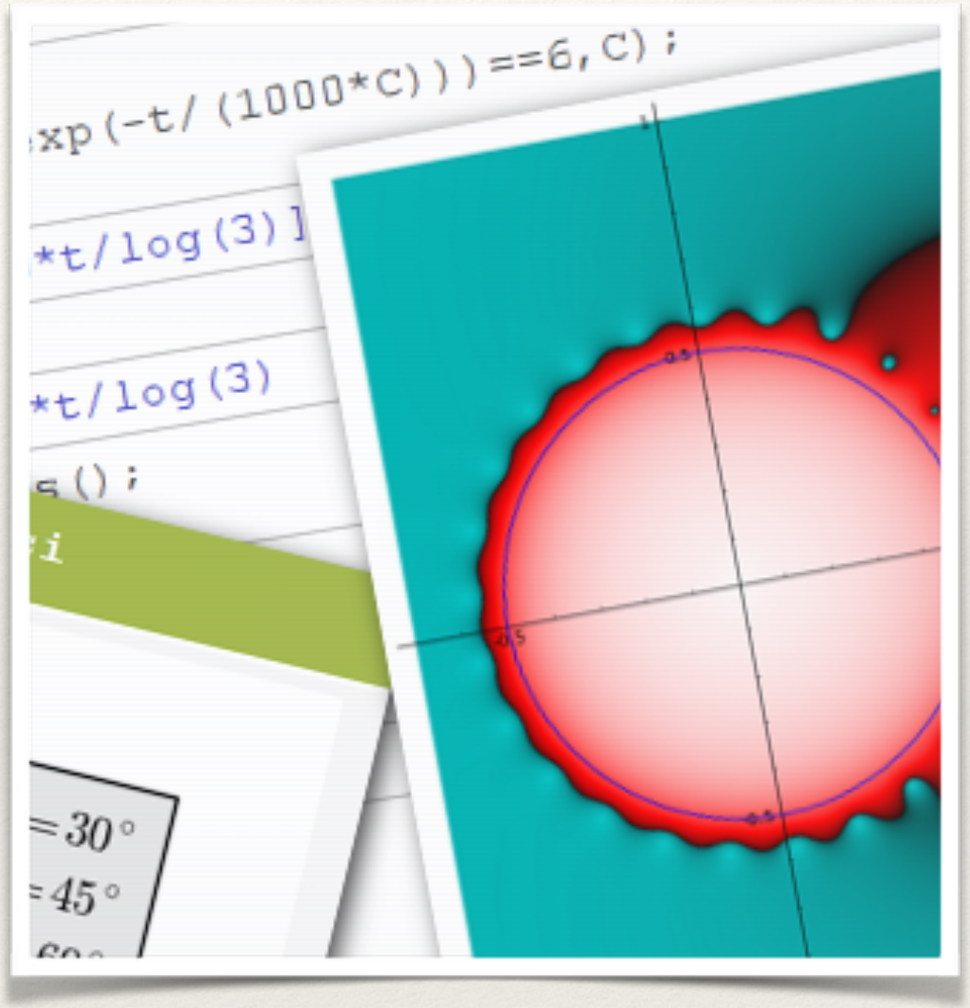
interactive books

Task 2.9 Deliverables: 2.8, 2.9, and 2.14

UŚląski delivers

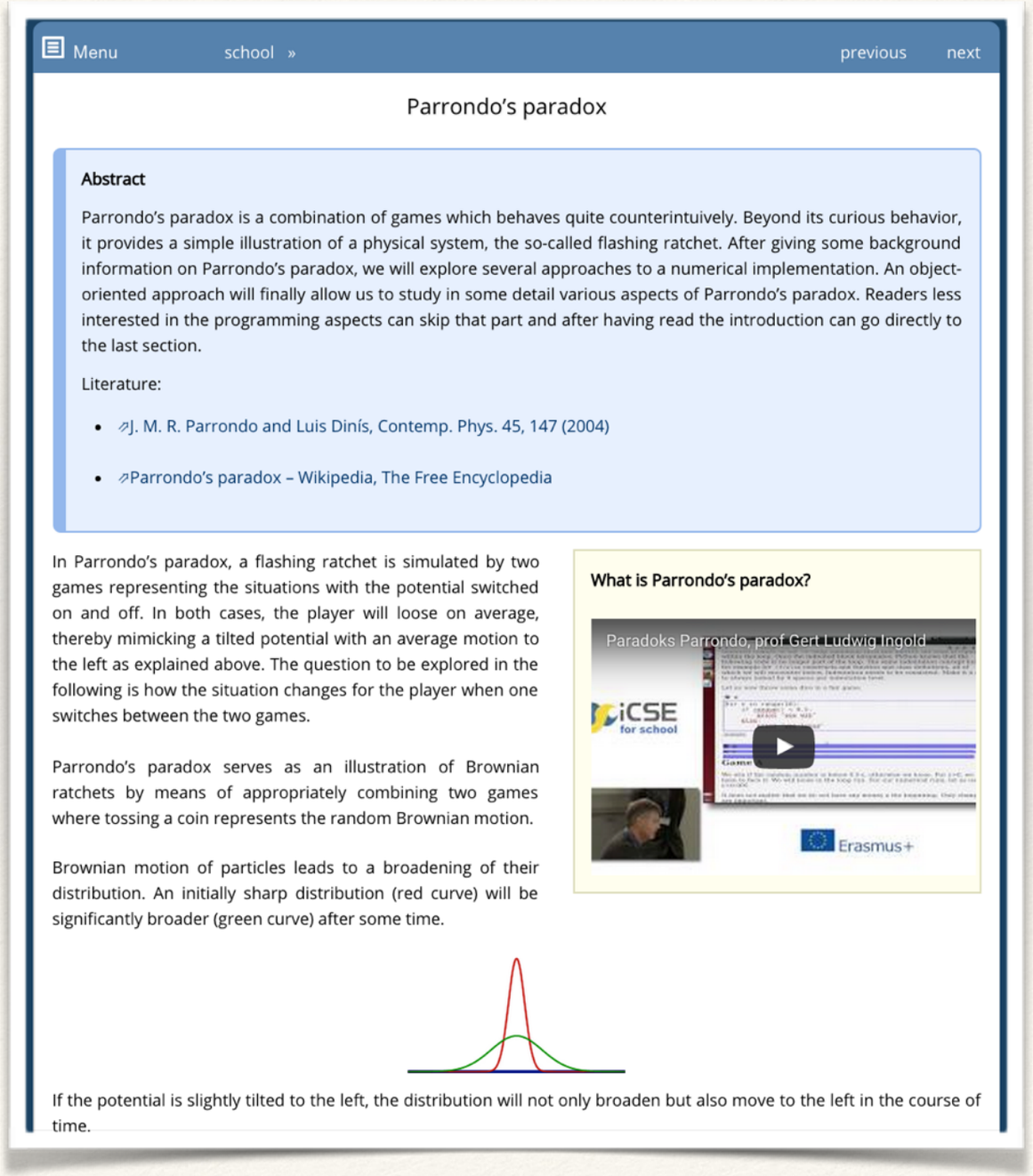
- Nonlinear Processes in Biology (D2.9)
- Linear Algebra (D2.8)
- Problems in Physics with Sage/Python (D2.14)

SOUTHAMPTON:
Computational Mathematics for Engineering (D2.14)



We will (try to) answer following questions:

- When is a fully interactive worksheet required and when is a textbook with executable code cells sufficient?
- How to assemble a classical monograph by reusing independently working building block of text and code?
- What are best tools and practices for using a single source for producing printed and electronic (interactive) textbooks?
- How to collaboratively write reusable course material?
- How can we facilitate automatic testing of all code examples, plots, etc?
- How can students can benefit from using VRE?



Tossing a coin

Let us try out the creation of random numbers. The numbers are generated in a way that they are equally distributed between 0 and 1. For the simplest fair game, we would define a threshold of 0.5 where the player wins if the random number is below the threshold and looses otherwise.

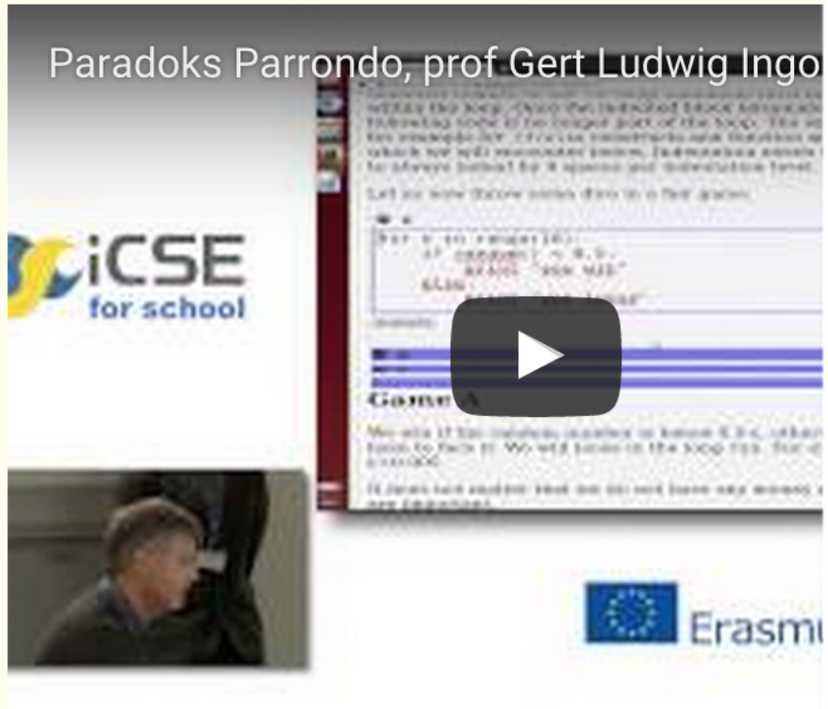
```
1  print random()
```

Wykonaj

```
0.306631890114
```

Help | Powered by SageMath

Let's play a game!



Experience with structured documents containing code

Sphinx & sagecell

https://github.com/marcinofulus/sphinx-sagecell

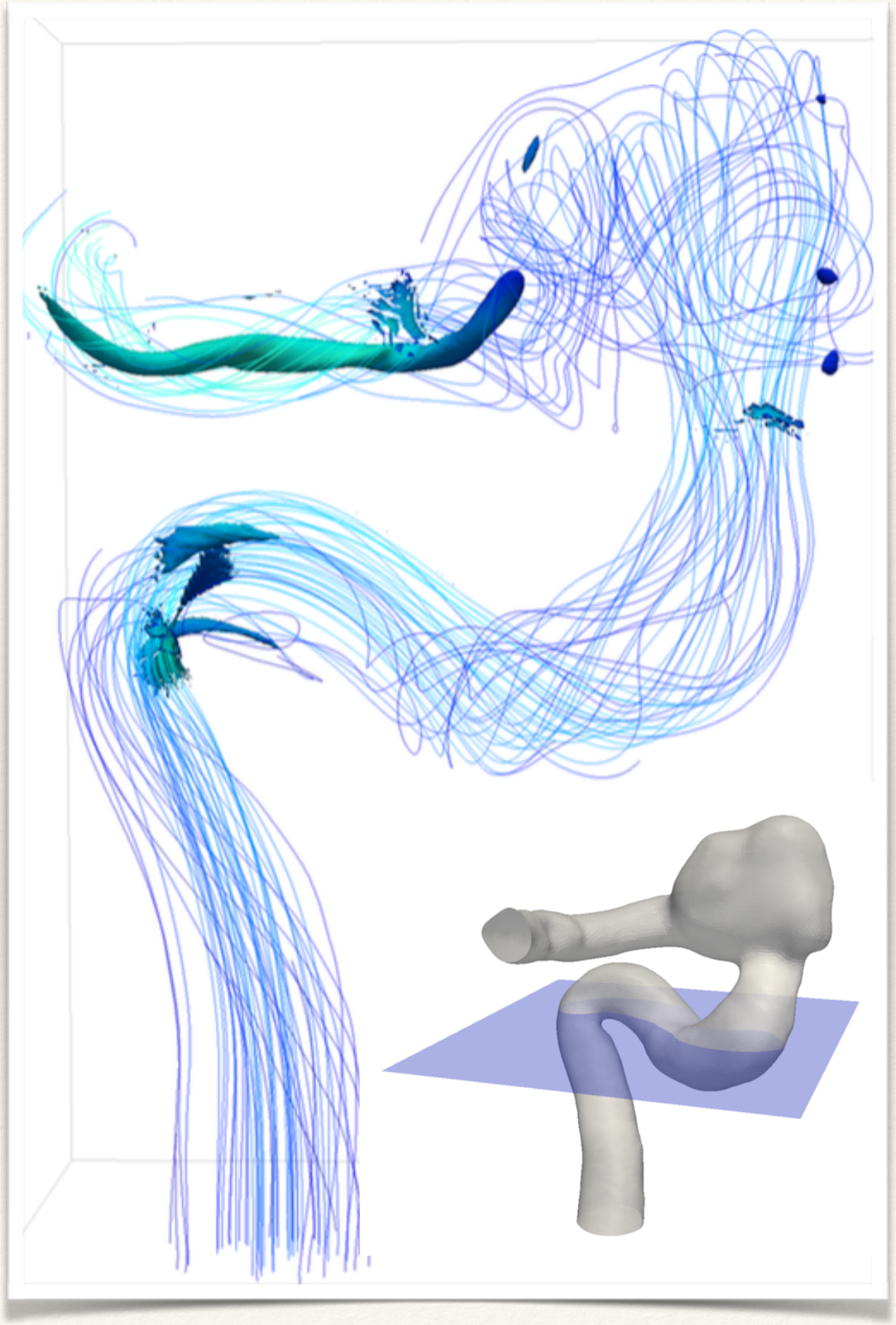
User interfaces, T4.8, T4.9, D4.12.

3d in Jupyter

Motivation:
Work with HPC fluid dynamics in notebook interface across large cluster installations.

Sailfish - Lattice Boltzmann solver, natively written for GPU

@UŚląski
- subcontracting
- already have a team of javascript coders



3d - ongoing effort

- Data types:
- STL files (STereoLithography)
- Text labels
- Vectors
- Vector fields in 2d (cut-plane of a scene) or 3d (with optional label)
- Points (with optional label)
- Lines made of n-segments (with optional label)
- Teksture on rectangle placed in 3d
- Surface from a function given on a regular mesh
- Unstructural meshes
- Voxels, displayed as solid cubes in 3d, based on data as boolean numpy array (3 index)