EXPERIENCES FROM TEACHING PHYSICS WITH IPYTHON NOTEBOOK
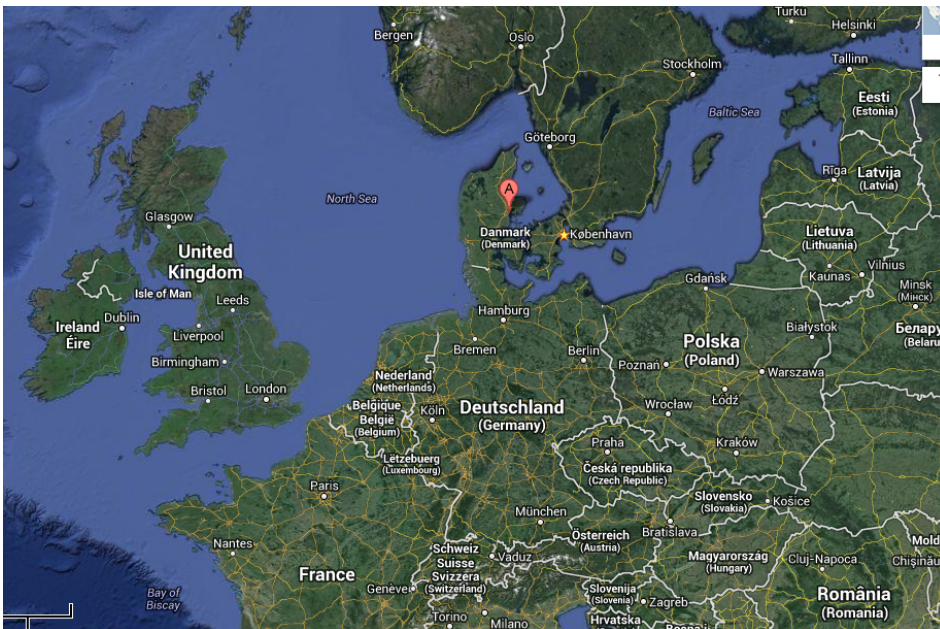
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INTRODUCTION

› Denmark
› Winner of European songcontest
› Birthplace of Søren Kierkegaard

TL;DR

› IPython is an awesome tool for teaching…

TL;DR

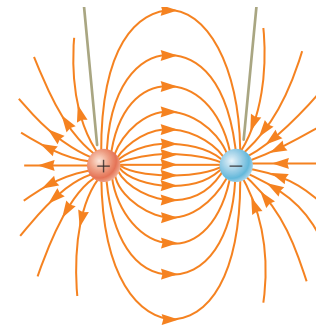› IPython is an awesome tool for teaching

› and possibly much more

TEACHING PHYSICS

› Physics is considered hard by students
› "What is the use?"

TEACHING PHYSICS

› ElectroMagnetics is abstract
› What is a field?
› How does semiconductors work?

IPYTHON NOTEBOOK

> Great tool
> Feels lightweight

IPYTHON NOTEBOOKS

› MatLab in a browser
› That is a MatLab that starts counting at zero!

PHYSICS EXTENSION

› Adds Physical Quantities to IPython
› Adds physical constants to Ipython
› Enables check if Units match
› Started by : %load_ext physics

HOW TO MAKE PHYSICS INTERESTING?

› Not a solved problem ☹
› Examples
› Examples
› Examples

EXPERIMENT

› Introduce IPython as an online calculator
› Show that it can use units
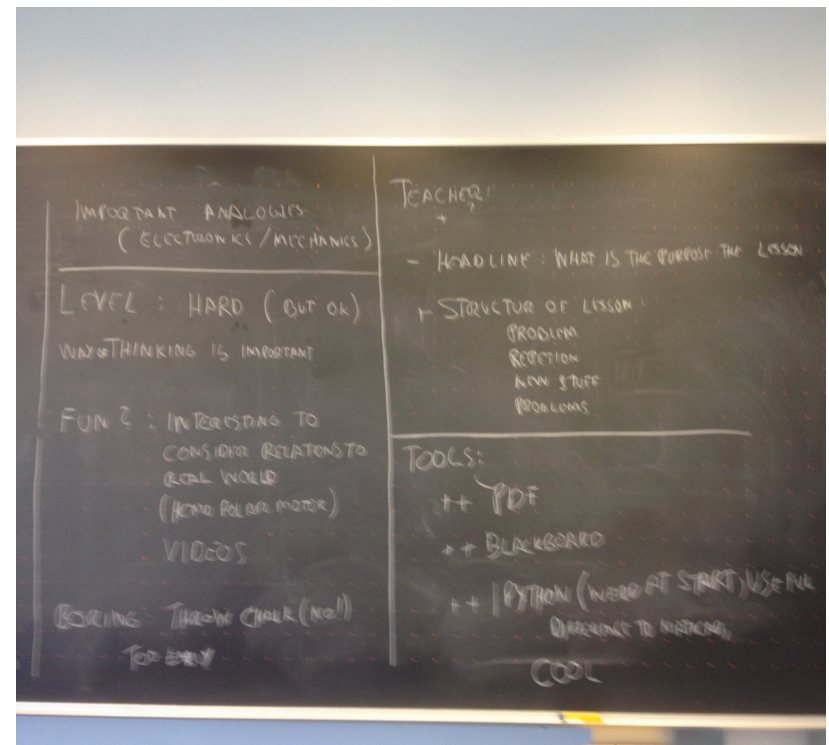› Extend by adding small functions

› Introduce plotting

RESULTS

› More attention in class
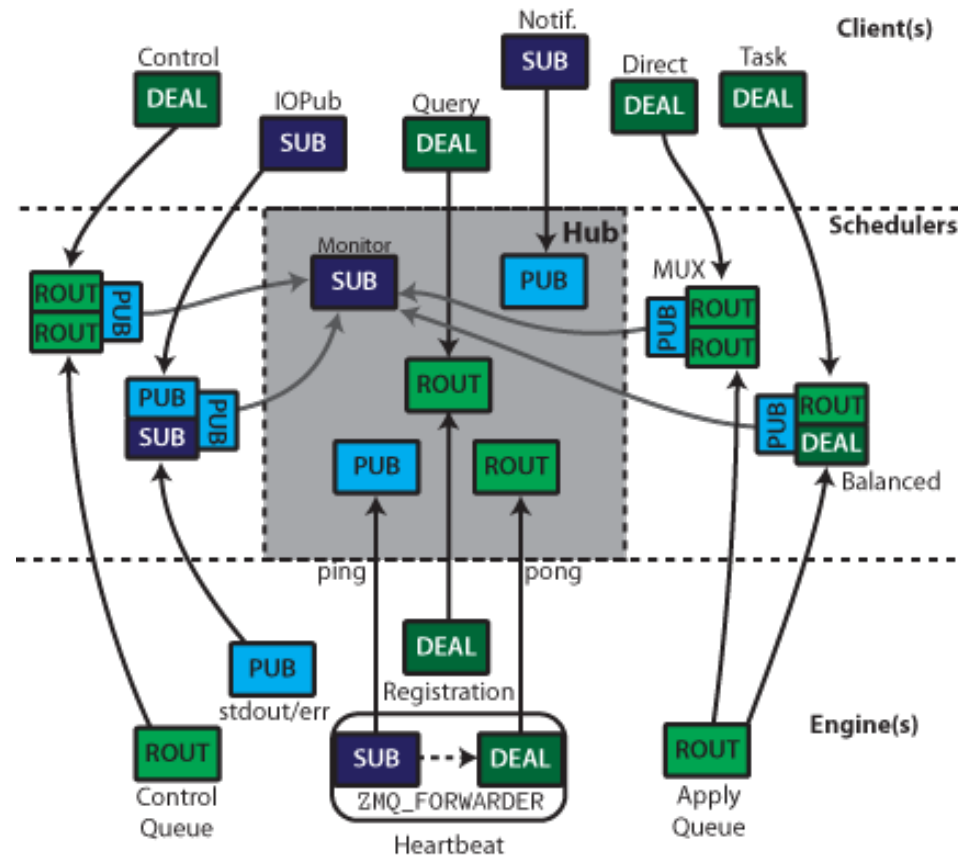› More questions to the subject at hand
› More interactive learning

RESULTS

› More attention in class
› More questions to the subject at hand
› More interactive learning

› Sideeffect: Students learned basic Python

FEEDBACK FROM STUDENTS

- Weird at start
- Cool
- Different to MathCad

IPYTHON NOTEBOOKS PLUMBING

GOOD THINGS

› Interactive experience (including typos etc)
› Units
› Inline plots

OK THINGS

› Python

ANNOYING THINGS

› Remember to save
› Towtruck

BAD THINGS

> No (little) Security

CONCLUSION

› IPython is an excellent tool for teaching

› ... but only a single tool in a range of teaching tools

FUTURE (WISHLIST)

› Quizzes
› A vehicle for selfstudy
› Group learning
› Examinations

WISHLIST 2

› Integration with version control
› Grow into an IDE (maybe it already is?)

IDEA

› Presentation framework

THANK YOU!

> Questions ?

APPLIED PHYSICS