

Python in Science and Engineering Education in India

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SciPy 2010
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Outline

Introduction and Goals

What we've done

Looking ahead

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National Mission on Education through ICT

MHRD

<http://www.sakshat.ac.in>

\$ One billion in three years

- ▶ 60% for connectivity
- ▶ 40% for content

Some other initiatives

- ▶ NPTEL: courses online
- ▶ Virtual labs

Open Source mission

Adaptation & deployment of open source simulation packages equivalent to MATLAB, ORCAD etc.

≈ \$ 20 million

IIT Bombay's take

- ▶ FOSSEE: **Python**
- ▶ FOSSEE: Scilab `scilab.in`
- ▶ Blender based animations:
`oscar.iitb.ac.in`

FOSSEE

Free Open-source Software for
Science and Engineering
Education

<http://fossee.in>

f **f** **o** **s** **s** **e** **e**

b **e** **t** **t** **e** **r**

SCIENCE AND ENGINEERING

e **d** **u** **c** **a** **t** **i** **o** **n**

Goals

Increase adoption of FOSS tools in
the curriculum

Current Focus

- ▶ Python
- ▶ Scilab

People

- ▶ Kannan Moudgalya, Mani Bhushan (CHE) – Scilab
 - ▶ Madhu Belur (EE) – Scilab
 - ▶ P S V Natraj (SysCon) – Scilab
 - ▶ G. Sivakumar (CSE)
-
- ▶ Prabhu Ramachandran (AE) – Python



Details ...

- ▶ Started in May 2009
- ▶ Pilot funding (1 yr): \$200,000
- ▶ 3 years total: \$1.7 million

Approach

- ▶ Curriculum
 - ▶ Design new courses
 - ▶ Modify existing courses
- ▶ Spread adoption
 - ▶ Workshops
 - ▶ Conferences
- ▶ Community Involvement

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Tasks taken up

- ▶ Curriculum
 - ▶ Design & prepare course material
- ▶ Spread adoption
 - ▶ Workshops for Python & Scilab
 - ▶ Hosting conferences
- ▶ Community Involvement
 - ▶ Freely available content
 - ▶ Infrastructure for community involvement

Workshops

- ▶ Python — 15 Workshops
Direct beneficiaries — 201 teachers & 567 students, 32 professionals
Indirect beneficiaries . . .
- ▶ Scilab — 9+ Workshops ¹
Direct beneficiaries — 254 teachers & 230 students
- ▶ Facilitated & funded 3 Faculty development programs

¹Jan. 2010

Intro tutorials at SciPy 2010



International Conference on Scientific Computing with Python

**December 12-17, Technopark
Thiruvananthapuram, Kerala**

Dec. 12-13- Conference • Dec. 14-15- Tutorials • Dec. 16-17- Sprints

Design/Material for SEES course

- ▶ Software Engineering for Engineers and Scientists
- ▶ Due: end of July
- ▶ Linux, Python and computing, \LaTeX , VC ...
- ▶ `hg.fossee.in/sttp/`
- ▶ `fossee.in/review`

DVD distributions

Beautiful is better than Ugly



LivePython 9.08

Fossee.in



IIT Bombay

Open Source
Software Mission

DVD Sponsored by
**National Mission on
Education Through ICT**
www.sakshat.ac.in

Conversion of existing courses

- ▶ Digital Control – CL 692 (done)
- ▶ Distributed Systems – CS 451 (ongoing)
- ▶ Matrix Computations – EE 636 (ongoing)

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PyTasks

- ▶ Online portal for community involvement
- ▶ Credit and cash

Spoken tutorials

`spoken-tutorial.org`

- ▶ **Screencasts for FOSS**

Certification

- ▶ Courses made available online
- ▶ Online examination

Conferences

Sage days 25
August 9–12th at IIT, Bombay
in conjunction with ICM

`fossee.in/sage_days`

Conferences

SciPy.in 2010
December at IIT, Hyderabad

Getting into the syllabus

- ▶ Try and push Python & Scilab into the syllabus in colleges
- ▶ Need — Books and Course Material

Getting into the syllabus

- ▶ Books at various levels using Python/Scilab
- ▶ Books for teaching introductory programming, data structures etc.
- ▶ Convert existing books that use other languages into using Python/Scilab

Getting into the syllabus

- ▶ Develop spoken tutorials for curricular activities
- ▶ Convert the existing workshops to spoken tutorials
- ▶ Develop supplementary material to solve problems using Python/Scilab

More courses

Advanced course on Python for
scientific computing

Help core projects

SciPy and Sage

Ideas welcome!

We're really excited about this!

Thank you!

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