FOSSEE Summer Fellowship Report

On

Creation of Spoken Tutorials

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Chapter 1

Introduction

The Spoken Tutorial Project is aimed to about teaching and learning a specific Free and Open Source Software such as Linux, LaTeX, C/C++, eSim etc. using a basic video tutorial. This popular multi-award winning educational portal is used to gain expertise over various Free and Open Source Softwares through individual learning. It's steady-paced, multi-lingual courses ensure that anybody with a computer and a desire for learning, can learn from any place, at any time and in a language of their choice. Students, Staff Teachers from Schools, Colleges, Universities, Poly-technics, ITIs, Skill centers, NGOs all can avail the training at very low cost.

The Spoken tutorial project facilitates learning in the online mode that is well-suited for long distance education. Both teachers and students can master the software from their own convenient time and place. which makes the project popular. Any student or faculty can master the courses on the latest courses and also get certificates. Lately, all government and private institutions are migrating to Open Source Softwares. People who are up to date with latest and open source software will have an edge in the job market and can also become entrepreneurs and save money by using open source software.

Spoken Tutorials offers partnership to some institutes to give their learners a range of 75+ relevant Basic and Specialized Courses. These include General IT skills, Programming, Web development, Multimedia, Mathematics, Sciences, Industrial process simulation packages and many more. Institutes can train unlimited students in many courses along with Certificates. IIT Bombay is leading the effort to popularise eSim. This effort is part of the Free and Open source Software for Science and Engineering Education (FOSSEE) project, supported by the National Mission on Education through ICT of the Ministry of Education. IIT Bombay is using Spoken Tutorials to create learning material for FOSS. This is the main page for the organisation of the scripts required for Scilab spoken tutorials. We invite the Scilab user community to participate in this activity. Overall coordination for the series was done by Rashmi Patankar and Sumanto Kar from FOSSEE project, IIT Bombay. Nirmala and Vineeta from Spoken Tutorial project, IIT Bombay, were the reviewers from ST end.

Chapter 2

Spoken Tutorial

2.1 Spoken Tutorial Project

Spoken Tutorial is a multi-award winning educational content portal. It provides numerous different resources on various FOSS to enable self learning among the users. It also provides the freedom to choose from multiple languages and also in their convinent place, time and pace. According to their expertise, the learner has the option to choose the tutorial that within their expertise level. To ensure the active participation of the learner, the tutorials are made in an interactive manner including side by side practice and assignments. The Spoken Tutorial project is funded by the National Mission on Education through Information and Communication Technology (ICT), launched by the Ministry of Human Resources and Development, Government of India. In these times where digital learning has become increasingly popular, initiatives like the Spoken Tutorial Project are of vital importance.

2.1.1 Process of creation of a Spoken Tutorial

- Outline:
  Creating an outline is the first step in the creation of a spoken tutorial. Outline of the spoken tutorial gives an understading about the contents explained in the tutorial.

- Script:
  A script is the written guide of the actions done in the tutorial. Every action small or big done during the tutorial is written in the script. The script strictly adheres to the Spoken tutorial guidelines and is made in a simple and straightforward manner.

- Slides:
  Slides are made to help understand the theory concepts better. The slides are made using LaTeX for good layout and presentation. Color and format used in the slides of a tutorial is uniform throught a series of tutorials in accordance with the ST guidelines.

- Novice check:
  Novice check is done by a person who has little or no knowledge of the software but has satidfied the pre-requisites of the tutorial. The novice points out the places where the tutorial is unclear or difficult to understand.

- Recording:
  The video is recorded according to the ST guidelines. The video is recorded with high quality and will scritly follow the script and avoid unwanted information.

- Review:
  After the above mentioned steps, all the related files are sent to the reviewer who verifies that the recording and files follow the ST guidelines. This is to double check the quality of the content to be uploaded. Once all comments and suggestions are taken care of, the tutorial is published in the Spoken tutorial website.

Chapter 3

eSim Simulations

eSim (previously known as Oscad / FreeEDA) is a free/libre and open source EDA tool for circuit design, simulation, analysis and PCB design. It is an integrated tool built using free/libre and open source software such as KiCad, Ngspice, Verilator, Makerchip, GHDL and OpenModelica. eSim is released under GPL.

eSim offers similar capabilities and ease of use as any equivalent proprietary software for schematic creation, simulation and PCB design, without having to pay a huge amount of money to procure licenses. Hence it can be an affordable alternative to educational institutions and SMEs. It can serve as an alternative to commercially available/licensed software tools like OrCAD, Xpedition and HSPICE.

Makerchip provides free and instant access to the latest tools directly from your browser and from your desktop. This includes open-source tools and proprietary ones. Turning the tables for the open-source community, Redwood EDA, LLC's commercial capabilities are often available for open-source development here first– before they are available commercially.

Chapter 4

Contributions

The eSim tutorial series currently consists of eleven tutorials. The tutorials explain how

In the eSim series, I have worked on 3 tutorials:

- Mixed Signal Simulation using NgVeri
- Makerchip IDE
- Advanced NgVeri

4.1 Mixed Signal Simulation using NgVeri

This tutorial explores the options in NgVeri and Makerchip in eSim. I have generated a schematic and netlist using NgVeri. I have explained in detail about three out of the five options in the Makerchip tab and two out of the four options in NgVeri tab. I wrote the script and slides for this tutorial which was then checked by my mentor followed by the novice. I also completed the recording for the tutorial.

- Opening a file in Makerchip tab
- File formats supported by the Makerchip tab
- Editing a file in Makerchip tab
- Options in the Makerchip tab
- Options in the NgVeri tab
- Run Verilog to NgSpice converter option
- Lintoff errors in Makerchip
- Creating a schematic using NgVeri
- Analog and digital blocks in the circuit
- Convert KiCad to Ngspice converter option

4.2 Makerchip IDE

This tutorial is a continuation of the previous tutorial and it explores the rest of the options in Makerchip and NgVeri. I have explained about the remaining two options in Makerchip tab and the two options in NgVeri tab. I have explained the options in Makerchip IDE. I wrote the script and slides for this tutorial which was then checked by my mentor followed by the novice. I also completed the recording for the tutorial.

- About Accept Makerchip TOS option
- About Edit in Makerchip option
- Removing errors in the Makerchip IDE
- Edit in Makerchip IDE
- Compile Code in Makerchip IDE
- Run Makerchip IDE
- See the simulated Waveforms in Makerchip IDE
- Add different Signals
- Rerun with the changed signals

4.3 Advanced NgVeri

This tutorial is a continuation of the previous tutorial and it explores the rest of the options in NgVeri. I have explained about the remaining two options in Makerchip tab and the two options in NgVeri tab. I have explained the options in Makerchip IDE. The rough draft of the script and slides were done by the Spoken Tutorial team. I have done the corrections in the tutorial and recorded the tutorial.

- Create a model of full_adder in eSim using Ngveri
- About Add Other file option
- Create a model of 8bit_vedic_multiplier in eSim using NgVeri
- About Add Folder option
- About Edit lint_off option
- About the EOFNEWLINE lint_off
- Errors due to the EOFNEWLINE lint_off
- About Add lint_off option
- About Edit modlst option
- Remove models using Edit modlst

Chapter 5

Challenges and Outcomes

5.1 Technical outcomes

Technical skills developed during this fellowship are:

- Basic eSim circuit simulations
- NgVeri
  - Simulation and analysis of mixed signal simulations
  - Conversion of verilog to Ngspice code
- Makerchip
  - Advanced verilog design
  - Circuit design in an easy manner

5.2 Professional outcomes

Professional skills developed during this fellowship are:

- Email etiquette
  I learnt to use proper mailing list thread for any formal communication or status update
- Effective time management
  I learnt to manage my time effectively and complete the given work within the alloted time in a best manner
- Prioritization of work
  I learnt to prioritize and balance between the fellowship and my project and complete both works without any lag

5.3 Challenges faced during the fellowship

Challenges faced during this fellowship are:

- Making a perfect script
- Balancing the 80-20 rule while increasing the explanation
- Maintaining the work spreadsheet on a daily basis

Chapter 6

Conclusion

This summer fellowship has been a very fruitful experience and I have honed my knowledge and skills . I was able to achieve my learning goals and learnt the different of Creating a Spoken Tutorial. Furthermore I experienced that it is of importance that the education is objective and that you have to be aware of the view of other people. This helped me to define what skills and knowledge I have to improve in the coming time.

The professional and technical skills I acquired from this internship will certainly help me in my future endaveours. I feel much more confidence in myself, and now I look forward to facing the upcoming challenges of the world. This fellowship has given me new insights and motivation to pursue my career.

Chapter 7

Current status of tutorials

- The Spoken Tutorials are presently undergoing review
- After all review phases have been successfully completed, the team will publish the videos on the Spoken Tutorial website

Chapter 8

References

- https://spoken-tutorial.org/about-us/
- https://spoken-tutorial.org/
- https://esim.fossee.in/home