

Summer Fellowship Report

On

I₽T_EX Spoken Tutorial Series

Submitted by

Arun Rajput Meenal Gaba Preeti Bamane

Under the guidance of

Prof.Kannan M. Moudgalya

Chemical Engineering Department IIT Bombay

02 July 2019

Acknowledgment

We are extremely thankful to **Prof. Kannan Moudgalya** for guiding and motivating us throughout the FOSSEE fellowship programme to work with FOSS (free and open source softwares), who inspite of being extraordinarily busy with his duties, took time to hear, guide and keep us on the correct path. We express our warm thanks to **Mrs. Nancy Varkey** for selecting us to be a part of the **Spoken Tutorial Project** and guiding us throughout the project without whom we would not be able to contribute to this project. We are extremely grateful to our mentors **Mrs. Firuza Aibara** and **Mr.Nagesh Karmali** for their immense support, dedication and giving us a broader picture of the whole scenario. We are also greateful to **Mrs. Usha Vishwanathan** for the utmost hospitality to the fellows and structured oraganisation of the fellowship. Lastly, we extend our warm gratiutude to the managers and staff of FOSSEE for their co-operation and assistance.

Sincerely, Arun Rajput Meenal Gaba Preeti Bamane

Contents

1	\mathbf{Spo}	ken Tutorial 5
	1.1	Purpose and Motto
	1.2	Project Description
		1.2.1 Script Creation Process for Spoken Tutorials
		1.2.2 Objective
2	Ind	ic Language Typesetting 7
	2.1	Indic Languages
	2.2	Fonts for Indic Languages
	2.3	Fonts Installation
		2.3.1 Nirmala UI font Installation in Ubuntu
		2.3.2 Fonts Installation in Windows
	2.4	Typesetting a Document
		2.4.1 $X_{\overline{H}} X_{\overline{E}} X$
		2.4.2 Fontspec Package \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 11
		2.4.3 Polyglossia Package
		2.4.4 LATEX Code with Nirmala UI font
		2.4.5 IATEX Code with Multiple fonts
	2.5	Spoken Tutorial Indic language Typesetting Scripts
3	Ma	cros, newcommands and newenvironments 16
	3.1	Commands
	3.2	Defining a new command
	3.3	Environment
4	Sty	le file 17
	4.1	General structure of a Package
	4.2	Created style files
	4.3	Spoken Tutorial Style Script
5	Bea	mer Themes and Animation 20
	5.1	Beamer Themes
	5.2	Animations
	5.3	IAT_EX Code for Beamer Theme and Animation:
	5.4	Spoken Tutorial Beamer theme and Animation Script

6	Tut	orial consideration	25
	6.1	Approved Topics	25
	6.2	Optional Topics (Future Work)	25

List of Figures

2.1	Font Installation Window in Ubuntu
2.2	Font Installation Window in Windows
2.3	Packages used in the $\mathbb{A}T_{\mathbb{E}}X$ code
2.4	Typesetting of Languages(Nirmal UI)
2.5	Output of the LATEX Code (Nirmala UI) $\dots \dots \dots$
2.6	Packages and Fonts used in the LATEX code
2.7	Typesetting of Languages (Multiple fonts)
2.8	Output of the LATEX Code (Multiple fonts) $\ldots \ldots \ldots \ldots \ldots \ldots \ldots 14$
4.1	Output PDF
5.1	Beamer Theme Output
5.2	Animation Output on slide 1
5.3	Animation Output on slide 2
5.4	Animation Output on slide 3

Spoken Tutorial

1.1 Purpose and Motto

The Spoken Tutorial project is the initiative of the 'Talk to a Teacher' activity of the National Mission on Education through Information and Communication Technology (ICT), launched by the Ministry of Human Resources and Development, Government of India.[1]

The spoken Tutorial Project aims to make spoken tutorials on FOSS available in several Indian languages, for the learner to be able to learn in the language he/she is comfortable in. The goal is to enable the use of spoken tutorials to teach in any Indian language, and to be taught to learners of all levels of expertise- Beginner, Intermediate or Advanced.

1.2 **Project Description**

1.2.1 Script Creation Process for Spoken Tutorials

Spoken Tutorial script creation process goes through multiple iterations before the script is ready to be used for the final production of a Spoken Tutorial video. The process helps the scriptwriter creator to adhere to various predefined guidelines outlined by the Spoken Tutorial project team.

The script is divided into individual scenes having a 2-column format containing Visual Cue and Narration. In each individual scene, "Visual Cue" is written as a series of events leading to actions, and "Narration" refers to the textual voice-over given by the speaker for its corresponding events in the visual cue.

1.2.2 Objective

This project aimed to create more Spoken Tutorials for $\[\]TEX$ The existing $\[\]TEX$ Spoken tutorials found on the link:

https://spoken-tutorial.org/tutorial-search/?search_foss=LaTeX

Indic Language Typesetting

2.1 Indic Languages

The Indic languages, are a major language family of South Asia. In the early 21st century, Indo-Aryan languages were spoken by more than 800 million people, primarily in India, Bangladesh, Nepal, Pakistan and Sri Lanka. The largest in terms of speakers are Hindustani (Hindi-Urdu, about 329 million), Bengali (242 million), Punjabi (about 100 million) and other languages, with a 2005 estimate placing the total number of native speakers at nearly 900 million. The Indic languages include Hindi, Urdu, Bengali, Sanskrit, and a number of other languages. These languages are the dominant language family of the Indian subcontinent.[2]

Indic Language Classification:

- Dardic: Pahayi, Khowar, Kohistani, Shina language, Kashiri
- Northern Zone: Central Pahari: Garhwali, Kumauni Eastern Pahari: Nepali North-Western Zone: Panjabi, Lahnda, Sindhi Dogri-Kangri: Dogri, Kangri, Mandeali, etc.
- Western Zone: Gujarati, Bhil, Khandeshi, Domari-Romani Rajasthani: Marwari, Rajasthani Hindi Sanskrit
- Southern Zone: Marathi, Konkani, Urdu Insular Indic: Sinhala, Maldivian
- Eastern Zone: Bengali, Oriya, Tharu Bihari: Bhojpuri, Maithili, etc.

2.2 Fonts for Indic Languages

In a country like India, where there are 22 languages which are written in 13 different scripts, with over 720 dialects, it is next to impossible that everyone will want to read English. Therefore, many businesses and individuals nowadays come up with websites which are in regional languages. In that case, they do need fonts of Indian languages which they can incorporate and write. [3] Some of the common, free and open source Indian language fonts available are as follows:

- Devanagari Hindi, Marathi, Sanskrit, Konkani, Nepali- The fonts available to write these languages are Mangal, Arial Unicode MS, Aparajita, Chandas, Gargi, Kalimati, Lohit Devanagari, Lohit Konkani, Lohit Kashmiri, Lohit Maithili, Lohit Marathi, Lohit Nepali, Lohit Sindhi, Nakula, Samanata, Sarai and Samyak Devanagar.
- Bengali, Assamese- The fonts named Vrinda, Shonar Bangla, Jamrul, Likhan, Lohit Assamese, Lohit Bengali, Mitra Mono, and Mukti are available for free.
- **Gujarati** User can make use of the free fonts Shruti, Aakar, Lohit Gujarati, Padmaa, Rekha and Samyak Gujarati.
- Kannada- User can make use of fonts Tunga,Kedage, Lohit Kannada and Mallige for the Kannada language which comes for free.
- Malayalam- User can make use of fonts Kritika, AnjaliOldLipi, Dyuthi, Lohit Malayalam, Meera Rachana, RaghuMalayalam, Samyak Malayalam and Suruma.which comes for free.
- Oriya- Kalinga,Lohit Oriya, Samyak Oriya, and Utkal are the fonts for the Oriya language which is also available for free.
- **Punjabi** There is a font named Raavi for writing content in the Punjabi language.
- **Tamil** There are free fonts available named Latha and Vijaya. If windows is not being used then go for these Tamil fonts Lohit Tamil and Samyak Tamil.
- **Telugu-** The fonts named Gautami, Vani, Lohit Telugu, Pothana2000, Vemana2000 are available for free.
- Urdu- Urdu Naskh Asiatype Fajer Noori Nastalique, Jameel Noori Nastaleeq, and Pak Nastaleeq can be used for writing in Urdu.[3]

The user can download any of the above fonts from the link:

https://www.lipikaar.com/fonts

Nirmala UI is an Indic scripts typeface(also known as font family) created by Tiro Typeworks and commissioned by Microsoft. It was first released with Windows 8 in 2012 as a UI font and supports languages using Bengali, Devanagari, Kannada, Gujarati, Gurmukhi, Malayalam, Odia, Ol Chiki, Sinhala, Sora Sompeng, Tamil and Telugu scripts. Nirmala UI font is available in all the version of Windows Operating system after version 8 and it can be downloaded and installed in any linux system.

2.3 Fonts Installation

The Indic language fonts are not available with the TeX distribution system. To type in Indic language need to be download and install the Open Type fonts in the system. OpenType fonts (.TTF or .OTF) used with the fontspec package. Text is usually represented in Unicode. X_HAT_EX is used to render Unicode-encoded input files (X_HAT_EX is more flexible and also accepts UTF-8, UTF-16 and UTF-32) into PDF documents.

2.3.1 Nirmala UI font Installation in Ubuntu

Nirmala UI font supports 12 different indic scripts but is not present in Linux systems, it needs to be installed in the system and then later it can be used for type-setting documents.

System Requirements- Ubuntu 18.04 or any other version.

Installation procedure:

- Step 1: Search for **Nirmala UI** font on browser and download the required zipped folder.
- Step 2: Extract the zipped folder and check for fonts file in it. Note that the extension of a font file is either .TTF or .OTF.
- Step 3: Now open the font file and click on the install button on the top right corner of the window as shown in the figure below.
- Step 4: At last to make sure that the font is installed in your system or not, go to all applications icon on bottom left corner of screen. Search for fonts viewer and open the file. Now search for the Nirmala UI font. If it is not available then repeate the above procedure again.



Figure 2.1: Font Installation Window in Ubuntu.

2.3.2 Fonts Installation in Windows

Indic languages such as hindi, tamil, bengali, telugu, malyalam supports Mangal, Latha, Shonar Bangla, Gautami and Kartika respectively and it is not present in Windows systems, it can be installed in the system and then later it can be used for typesetting documents.

System Requirements- Windows 10 or any other version Installation procedure:

- Step 1: Search for **Mangal** font on browser and download the required zipped folder.
- Step 2: Extract the zipped folder and check for font file in it. The downloaded file is of .TTF format which represent a font file.
- Step 3: Now open the font file and click on the install button on the top left corner of the window as shown in the figure below.
- Step 4: At last to make sure that the font is installed in your system or not, go to search box on the taskbar on bottom left corner of screen and search for Control Panel app. Select Appearance and Personalization then at the bottom, select Fonts. Now search for the Mangal font. If it is not available then repeate the above procedure again.



Figure 2.2: Font Installation Window in Windows.

2.4 Typesetting a Document

With the gradual increase in number of Indic Language users, there is need for a mechanism which will help the users to create documents in these Languages. As stated earlier, LATEX supports multi-lingual typesetting. So, it can be used to create documents in different indic languages with different fonts using various packages. The following sections describe the compiler and packages used to typeset indic languages.

$2.4.1 \quad X_{\Xi} \square T_E X$

Even though IAT_EX provides an extensive set of fonts, user may want to use an external font they really like and the font they have already installed system-wide, this is possible with $X_{\Xi}T_EX$. It is a T_EX typesetting engine using Unicode and supporting modern font technologies such as OpenType (OTF), TrueType (TTF), Graphite, and Apple Advanced Typography (AAT). The corresponding compilers are $X_{\Xi}T_EX$ and $X_{\Xi}IAT_EX$.

2.4.2 Fontspec Package

The fontspec package allows users of either $X_{\underline{H}}T_{\underline{E}}X$ or LuaT_{\underline{E}}X to load OpenType fonts in a LAT_{\underline{E}}X document. No font installation is necessary, and font features can be selected and used as desired throughout the document. It gives us the facility to switch or use different fonts in the same LAT_{\underline{E}}X document.

2.4.3 Polyglossia Package

Polyglossia is a package for facilitating multilingual typesetting with X_HET_EXPolyglossia package allows to typeset indic languages in a X_HET_EX document. If this package is not included then sentences in languages other than english will not be processed in the output.

2.4.4 LATEX Code with Nirmala UI font

Below are the snippets of code and screenshot of it's ouput pdf which typesets a document in Hindi, Tamil, Bengali, Telugu and Malayalam languages. The font used here is Nirmala UI which supports all the languages used. This font was installed in Ubuntu systems by the procedure stated in subsection 2.3.1. The code is compiled using X_HE_TEX which is selected from the drop down on the top toolbar of TeXWorks.

LATEX Code with Nirmala UI font:



Figure 2.3: Packages used in the IAT_EX code.



Figure 2.4: Typesetting of Languages(Nirmal UI)



Figure 2.5: Output of the LATEX Code (Nirmala UI)

2.4.5 IT_EX Code with Multiple fonts

Below are the snippets of code and screenshot of it's ouput pdf which typesets a document in Hindi, Tamil, Bengali, Telugu and Malayalam languages whic supports Mangal, Latha, Shonar Bangla, Gautami and Kartika respectively. This font was installed in Windows systems by the procedure stated in subsection 2.3.2. The code is compiled using X_{Ξ} which is selected from the drop down on the top toolbar of TeXWorks.

I₄T_EX Code with Multiple fonts:



Figure 2.6: Packages and Fonts used in the LATEX code.

multiscript.tex* - TeXworks
File Edit Search Format Typeset Scripts Window Help
🕨 🔀 🔨 之 🔀 📃 🔍 🔨 🔪
hanin (damumant)
{begin{document}
\textbf{\Large Multiple language typesetting} \bigskip
\par \textbf{English} \par Knowledge is the supreme goal \medskip
\textbf{Bengali} \par\selectlanguage{bengali} জ্ঞান সর্বোচ্চ লক্ষ্য \medskip
\textbf{Telugu} \par \selectlanguage{telugu} నాలెడ్డ్ సుప్రిం గోల్
\medskip
\textbf{Malayalam} \par \selectianguage{malayalam} അറിവ് സുപ്രധാന ലക്ഷ്യമാണ് \medskip
\textbf{Tamil} \par \selectlanguage{tamil} அறிவு மிகச் சிறந்த இலக்கு
\medskip
\textbf{Hindi} \par \selectlanguage{hindi} जान सर्वोच्च लस्य हे \medskip
\end{document}

Figure 2.7: Typesetting of Languages (Multiple fonts)

English	ie ianguage typesetting
Knowledge	is the supreme goal
Bengali জান সংৰ্বাচ্চ লক্ষ	3
Telugu నాలెడ్జ్ సుప్రీం	గోల్
Malayalam അറിവ് ന	സുപ്രധാന ലക്ഷ്യമാണ്
Tamil அறிவு மீ)கச் சிறந்த இலக்கு.
Hindi ज्ञान सर्वोच्च	ा लक्ष्य है

Figure 2.8: Output of the ${\rm IAT}_{E\!X}$ Code (Multiple fonts)

2.5 Spoken Tutorial Indic language Typesetting Scripts

Spoken tutorial Script for the following have been written: Ubuntu:

https://docs.google.com/document/d/1pTNaDhzO2ScoePpWPqN-EYqPshiH-yqh yu2KdAcdSo4/edit

Windows:

https://docs.google.com/document/d/1cXBaW9kA-D4MdPeBKnNYt6rXppGoUwGA LgTMCZ35Dlo/edit

Macros, newcommands and newenvironments

3.1 Commands

 IeT_EX typesetting is made by using special tags or commands that provide a handful of ways to format your document. Sometimes standard commands are not enough to fulfil some specific needs, in such cases new commands can be defined.

3.2 Defining a new command

New commands are defined by \newcommand statement.

The statement

has two parameters that define a new command \R - This is the name of the new command.

3.3 Environment

Environments are used to format blocks of text in a LATEX documents.

Environments are delimited by an opening tag \begin and a closing tag \end. Everything inside those tags will be formatted in a special manner depending on the type of the environment.

Style file

The default formatting in LaTeX documents is determined by the class used by that document. This default look can be changed and more functionalities can be added by means of a package. The class file names have the .cls extension, the package file names have the .sty extension.

Sometimes the best option to use your own commands and macros in a document is to write a new package from scratch.

4.1 General structure of a Package

The structure of all package files can be roughly described in the next four parts:

- Identification The file declares itself as a package written with the ET_EX2_e syntax.
- **Preliminary declarations** Here the external packages needed are imported. Also, in this part of the file the commands and definitions needed by the declared options are coded.
- **Options** The package declares and processes the options.
- More declarations The main body of the package. Almost everything a package does is defined here.

4.2 Created style files

custom.tex

```
1 \documentclass{article}
2 \usepackage{myPackage}
3 \begin{document}
4 Welcome to \iitb
5 \iitbbg
6 \end{document}
```

myPackage.sty

```
1 \RequirePackage{background}
2 \newcommand{\iitb}{\textbf{Indian Institute of
    Technology - Bombay}}
3 \newcommand{\iitbbg}{\backgroundsetup{scale = 1, angle
    = 0, opacity = 0.1,
4 contents = {\includegraphics[width = \paperwidth,
5 height = \paperheight, keepaspectratio] {iitblogo.
    pdf}}}
```

myStdPackage.sty

```
1
  \NeedsTeXFormat{LaTeX2e}
  \ProvidesPackage{myStdPackage}[2019/03/11 v0.01 LaTeX
2
     package for my own purpose]
  \RequirePackage{background}
3
  \newcommand{\iitb}{\textbf{Indian Institute of
4
     Technology - Bombay}}
  \newcommand{\iitbbg}{\backgroundsetup{scale = 1, angle
5
     = 0, opacity = 0.1,
6
    contents = {\includegraphics[width = \paperwidth,
7
      height = \paperheight, keepaspectratio] {iitblogo.
         pdf } } }
8
  \endinput
```



Figure 4.1: Output PDF

4.3 Spoken Tutorial Style Script

Spoken tutorial Script has been written which can be found on following link: Writing style file in LaTeX:

https://docs.google.com/document/d/1y2YUi-Mab474B_TIIJUwoJPz6t31L2BGY
-ZQoT7mFPs/edit

Beamer Themes and Animation

Beamer is a LaTeX document class for creating slides for presentation. It helps the user to create presentation by writing simple ET_EX code where the resultant slides are in pdf format.

5.1 Beamer Themes

Themes make it easy to change the appearance of a presentation. The beamer class uses different kinds of themes:

- Beamer Themes:- Beamer allowed to use themes to enhance the presentation. These themes will drastically change the visual presentation. It is used to described every aspect of a presentation such as colour, font, the way the bullets and number of enumeration look, etc. Some themes show sections and/or subsections in the navigation bars. By clicking on a section or subsection in the navigation bar, it will be easy to jump on that section slide.[4]
- Color Themes :- When using themes the standard color that appear is blue. Color of the theme can be changed using the command \usecolortheme[color theme name] in the preamble. For a particular chosen presentation theme, the color theme only changes the color of the presentation.

The user can download Beamer theme and color theme from the Beamer theme matrix link https://hartwork.org/beamer-theme-matrix/

5.2 Animations

Animation created in a portable way by using the overlay commands of the beamer package to create a series of slides. The overlay specifications can be added to compatible LATEX commands using angular brackets after the command name. Overlay is a term used by the beamer document class to describe the layering of slides.[5]

Commands with Overlay Specifications:

• \onslide< digit -> command animated all the text according to the number present in angular bracket.

- \only< digit > command animated only one text at time in the slide according to the number present in angular bracket.
- $\ \$ uncover < digit > command animated all the text in the slide according to the number present in angular bracket.

5.3 LATEX Code for Beamer Theme and Animation:

```
\documentclass[a4paper, 16pt]{beamer}
1
2
3
   \usetheme{Warsaw}
4
5
   \begin{document}
6
7
   \author{Preeti Bamane}
   \title{Spoken tutorial: \\Presentation in Beamer}
8
9
10
   \date{\today}
11
   \begin{frame}
12
  \titlepage
13
   \end{frame}
14
15
16
   \section{Beamer Themes}
   \subsection{Themes}
17
   \begin {frame}
18
19
            \frametitle{Sampling of Themes}
20
            \begin{itemize}
21
                \item Antibes
                \item Berlin
22
23
                \item Copenhagen
24
            \end{itemize}
   \end{frame}
25
26
27
   \subsection{Color Themes}
28
   \begin {frame}
29
          \frametitle{Color Themes}
30
           \begin{itemize}
                \item Inner color themes
31
32
                \item Outer color themes
           \end{itemize}
33
   \end{frame}
34
35
36
```

```
37 \section{Introduction}
38
   \subsection{Overlays specifications}
39 \begin {frame}
40
            \frametitle{Overlay specifications}
41
                \begin{enumerate}[(I)]
42
                               \item onslide
43
                                        \begin{itemize}
44
                                                  \item uncover
45
                                                  \item only
46
                                        \end{itemize}
47
                               \item visible
48
                               \item invisible
49 \\end{enumerate}
50 \mid \text{lend} \{ \text{frame} \}
51
52 \section[Animation]{}
53 \mid \text{begin}\{\text{frame}\}
54 \\frametitle{Overlay}
55 \onslide<1->{First Line of Text} \\
56 \mid \text{onslide} <2-> \{ \text{Second Line of Text} \} \setminus
   \onslide<3->{Third Line of Text}
57
58 \mid \text{end} \{ \text{frame} \}
59
60 \section[Animation]{}
61 \begin{frame}
62 \\frametitle{Overlay}
63 \setbeamercovered {transparent}
   \onslide<1->{First Line of Text} \\
64
   \onslide<2->{Second Line of Text} \\
65
66 \onslide <3->{Third Line of Text}
67 \mid \text{\ lend} \{ \text{frame} \}
68
69 \begin{frame}
70 \\frametitle{Overlay}
71 \\setbeamercovered{transparent}
   \uncover<1> { First Line of Text} \\
72
   \uncover<3> {Third Line of Text} \\
73
   \uncover<2> { Second Line of Text} \\
74
75
   \uncover<5> {Fifth Line of Text} \\
76
   \uncover<4> {Fourth Line of Text}
77 | \leq frame \}
78
79 \begin{frame}
80 \\frametitle{Overlay}
81 \only<1>{First Line of Text}
82 \\only<2>{Second Line of Text}
```

```
83 \only<3>{Third Line of Text}
84 \end{frame}
85
86 \end{document}
```



Figure 5.1: Beamer Theme Output



Figure 5.2: Animation Output on slide 1



Figure 5.3: Animation Output on slide 2



Figure 5.4: Animation Output on slide 3

5.4 Spoken Tutorial Beamer theme and Animation Script

Spoken tutorial Script has been written which can be found on following link: Beamer theme and Animation :

https://docs.google.com/document/d/1IunnQB5LXTniP60630NFt2XcmiWkY8u7 IWnjK8F-MMQ/edit

Tutorial consideration

6.1 Approved Topics

- Indic language typesetting on Ubuntu
- Indic language typesetting on Windows
- Writing Style files in $\mathbb{P}_{T_E}X$
- Beamer Themes and Animation

6.2 Optional Topics (Future Work)

• Inscript Keyboard

Inscript keyboard allows users to type directly in any desired indic language.

• Transliteration

Transliteration is a parallel typesetting method using which users write in Romanised Sanskrit and gets output in Sanskrit script.

• Beautifying the presentation using Beamer

Allow user to beautify the presentation using shadowbox, fancy bullets, video and transition effects.

Bibliography

- [1] https://spoken-tutorial.org/about-us/.
- [2] https://en.wikipedia.org/wiki/Indo-Aryan_languages.
- [3] https://www.lipikaar.com/fonts.
- [4] https://en.wikibooks.org/wiki/LaTeX.
- [5] https://www.overleaf.com/learn/latex/Tutorials.