

# Beamer Slide Generator: User Manual

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## 1 Introduction

BeamerSlideGenerator is a Python tool designed to simplify the creation of Beamer presentations with multimedia content. It automates the process of downloading media files and generating LaTeX code for slides with proper formatting and structure.

## 2 Installation

1. Ensure Python 3.x is installed on your system
2. Required Python packages:
  - requests
  - Pillow (PIL)
3. Place BeamerSlideGenerator.py in your working directory

## 3 Usage Modes

### 3.1 Single Media Mode (Option 1)

This mode allows you to add individual slides to a cumulative presentation file (movie.tex).

#### Example

```
Enter the media URL: https://example.com/image.jpg
Enter content for the right column (optional):
- Point 1
- Point 2
```

### 3.2 Batch Processing Mode (Option 2)

This mode processes a text file containing multiple slide definitions and creates a new .tex file named after the input file.

## 4 Input File Format

The input file supports several commands and structures:

## Commands

- `\title <content>` - Sets the slide title
- `\play <URL>` - Indicates media should be playable
- `\begin{Content}` - Starts a content block
- `\end{Content}` - Ends a content block

## 5 Example Input File

```
\title My First Slide
\begin{Content} https://example.com/image1.jpg
- Bullet point 1
- Bullet point 2
\end{Content}

\title Interactive Media
\play https://example.com/animation.gif
```

## 6 Output Structure

The generator creates:

- A .tex file with Beamer slides
- A media\_files directory containing downloaded media

## 7 Key Features

- Automatic media downloading and organization
- Enhanced support for playable media with preview frames
- Automatic preview generation for videos and animations
- Smart handling of different media types (video, audio, images)
- Two-column layout with customizable content
- Automatic bullet point formatting
- Custom slide titles
- Batch processing capability

## 8 Media Handling Features

### 8.1 Enhanced Play Directive

The generator now supports an enhanced `\play` directive that works with both URLs and local files:

### Play Directive Examples

```
% For URLs:
\begin{Content} \play https://example.com/video.mp4

% For local files:
\begin{Content} \play \file media_files/video.mp4
```

## 8.2 Preview Frame Generation

The system automatically generates appropriate previews for different media types:

- Videos: First frame extracted as preview
- Animated GIFs: First frame saved as static image
- Audio files: Placeholder icon generated
- Static images: Used as-is

## 8.3 Media Type Support

Supported media formats:

### Supported Formats

- Videos: .mp4, .avi, .mov, .mkv
- Images: .png, .jpg, .jpeg, .gif
- Audio: .mp3, .wav, .ogg

# 9 Example Input File with New Features

```
\title Video Demonstration
\begin{Content} \play \file media_files/demo.mp4
- This slide includes a video with preview frame
- Click play to start the video
\end{Content}

\title Audio Example
\begin{Content} \play \file media_files/audio.mp3
- Audio file with auto-generated icon
- Supports various audio formats
\end{Content}

\title Animation Demo
\begin{Content} \play https://example.com/animation.gif
- Animated GIF with first frame preview
- Auto-downloaded and processed
\end{Content}
```

## 10 Media Processing Features

### 10.1 Automatic Preview Generation

The system now includes:

- Automatic extraction of video first frames
- GIF animation first frame capture
- Audio file icon generation
- Preview frame caching for better performance

### 10.2 Media File Management

Enhanced media handling includes:

- Automatic media directory creation
- Smart file naming and organization
- Preview file management
- Format-specific processing

## 11 Best Practices for Media Integration

1. Use `\play` directive for all playable media
2. Keep video files reasonably sized for smooth playback
3. Test media playback after presentation generation
4. Use appropriate media formats for different content types
5. Consider preview image quality for videos

## 12 New Troubleshooting Guide

Additional troubleshooting scenarios:

- Preview Generation Issues:
  - Ensure required libraries (opencv-python) are installed
  - Check media file integrity
  - Verify file permissions in `media_files` directory
- Playback Problems:
  - Confirm media player compatibility
  - Check codec availability
  - Verify file path accuracy
- Media Update Issues:
  - Check file permissions
  - Verify media file existence
  - Ensure correct file paths in directives

## 13 Advanced Usage Examples

### 13.1 Video Presentation with Previews

Example: Video Slides

```
\title Introduction
\begin{Content} \play \file media_files/intro.mp4
- Welcome to the presentation
- Click play to start the introduction video
\end{Content}

\title Key Points
\begin{Content} \play \file media_files/demo.mp4
- Demonstration of main features
- Interactive video content
\end{Content}
```

### 13.2 Mixed Media Presentation

Example: Mixed Media

```
\title Overview
\begin{Content} \file media_files/static.png
- Static image for overview
- No play button needed
\end{Content}

\title Interactive Demo
\begin{Content} \play \file media_files/demo.gif
- Animated demonstration
- With preview frame
\end{Content}
```

## 14 Creating New Presentations

### 14.1 Starting the Creation Process

First, launch the generator and select the creation mode:

### Initial Launch

```
$ python BeamerSlideGenerator.py

BeamerSlideGenerator: Creating slides for presentations
Choose an option:
1. Process a single media URL (appends to movie.tex)
2. Process multiple media files from an input file (creates new .tex file)
Enter your choice (1 or 2): 2

Enter the path to the input file: neural_networks.txt

File neural_networks.txt does not exist.
Would you like to create a new presentation? (y/n): y
```

## 14.2 Initial Setup Configuration

Next, configure the basic presentation details:

### Presentation Setup

```
Presentation Setup:
-----
Title: Advanced Neural Networks
Subtitle (press Enter to skip): A Comprehensive Guide
Author Name: John Smith
Institution: Neural Computing Research Lab
Short Institution Name (optional, press Enter to skip): NCRL
Date (press Enter for today): [Enter]

Creating new input file: neural_networks.txt
Enter empty line at Title prompt to finish.
```

## 14.3 Creating the First Slide

Here's the process for creating the first slide:

### First Slide Creation

```
[Slide1] Title: Introduction to Neural Networks

[Slide1] Media selection:
Opening Google Image search for: Introduction to Neural Networks scientific diagram
Please choose one of the following options:
1. Enter a URL
2. Use an existing file from media_files folder
3. Create slide without media
Your choice (1/2/3): 1
Enter URL: https://example.com/neural_network.png

[Slide1] Content (enter empty line to finish):
- Understanding the basics of neural networks
- Key components and architecture
- Historical development
- Modern applications
[Enter blank line]

[Slide1] Footnote (press Enter to skip): Based on "Deep Learning" by Goodfellow et al.
```

## 14.4 Creating the Second Slide

Process for the second slide:

### Second Slide Creation

```
[Slide2] Title: Network Architecture

[Slide2] Media selection:
Opening Google Image search for: Network Architecture scientific diagram
Please choose one of the following options:
1. Enter a URL
2. Use an existing file from media_files folder
3. Create slide without media
Your choice (1/2/3): 2

Available files in media_files folder:
1. architecture.png
2. layers.gif
Enter file number or name: 2

[Slide2] Content (enter empty line to finish):
- Layer types and functions
- Connection patterns
- Information flow
[Enter blank line]

[Slide2] Footnote (press Enter to skip): \url{http://neuralnetworks.com}
```

## 14.5 Creating the Final Slide

Process for the third slide and finishing:

### Third Slide and Completion

[Slide3] Title: Training Process

[Slide3] Media selection:

Opening Google Image search for: Training Process scientific diagram

Please choose one of the following options:

1. Enter a URL
2. Use an existing file from media\_files folder
3. Create slide without media

Your choice (1/2/3): 1

Enter URL: [https://example.com/training\\_video.mp4](https://example.com/training_video.mp4)

[Slide3] Content (enter empty line to finish):

- Backpropagation explained
- Gradient descent optimization
- Training parameters

[Enter blank line]

[Slide3] Footnote (press Enter to skip): Click play to see animation

[Slide4] Title: [Enter blank line to finish]

Successfully created neural\_networks.txt with 3 slides.

## 14.6 Generated Text File Structure

The above process generates a structured text file:

Beginning of neural\_networks.txt

```
\documentclass[aspectratio=169]{beamer}
\usepackage{hyperref}
\usepackage{graphicx}
[... preamble ...]

\title{Advanced Neural Networks}
\subtitle{A Comprehensive Guide}
\author{John Smith}
\institute{\textcolor{mygreen}{Neural Computing Research Lab}}
\date{\today}

\begin{document}

\begin{frame}
\titlepage
\end{frame}
```



#### First Slide in Generated File

```
\title Introduction to Neural Networks
\begin{Content} \file media_files/neural_network.png
- Understanding the basics of neural networks
- Key components and architecture
- Historical development
- Modern applications
\footnote{\tiny Based on "Deep Learning" by Goodfellow et al.}
\end{Content}
```

#### Second Slide in Generated File

```
\title Network Architecture
\begin{Content} \play \file media_files/layers.gif
- Layer types and functions
- Connection patterns
- Information flow
\footnote{\tiny \url{http://neuralnetworks.com}}
\end{Content}
```

#### Final Slide and Document End

```
\title Training Process
\begin{Content} \play \file media_files/training_video.mp4
- Backpropagation explained
- Gradient descent optimization
- Training parameters
\footnote{\tiny Click play to see animation}
\end{Content}

\end{document}
```

## 14.7 Key Points About the Creation Process

- Each slide creation follows a consistent four-step process:
  1. Enter slide title
  2. Select media source
  3. Add content bullet points
  4. Optionally add footnote
- Enter an empty line for the title to finish the creation process
- Media can be selected from URLs or existing files
- The system automatically handles media downloads
- Playable media gets appropriate preview frames
- Content is automatically formatted with bullet points

## 14.8 Tips for Interactive Creation

1. Prepare your media files or URLs beforehand
2. Use descriptive slide titles for better organization
3. Keep bullet points concise and clear
4. Use footnotes for attributions and additional information
5. Consider using short institution names for better footer display
6. Test media playback after creating the presentation

## 14.9 Editing the Generated File

After creation, you can:

- Manually edit the text file to make changes
- Add or modify content and media
- Adjust formatting and layout
- Run the generator again to update the presentation

## 15 Configuration Examples

### 15.1 Title and Institution Configurations

Here are examples of different title and institution configurations:

#### Long Institution Name Example

Presentation Setup:

-----

Title: Quantum Computing Advances

Subtitle (press Enter to skip): Recent Developments

Author Name: Dr. Sarah Johnson

Institution: International Center for Quantum Information Science and Technology

Your institution name is quite long and might get trimmed in slides.

It's recommended to provide a shorter version for the slide footers.

Short Institution Name: ICQIST

Date (press Enter for today): [Enter]

#### Multi-line Institution Example

Title: Advanced Materials Research

Subtitle (press Enter to skip): Nanomaterials and Applications

Author Name: Prof. Robert Chen

Institution: Department of Materials Science\\Faculty of Engineering\\University of Technology

Short Institution Name: MatSci-UoT

Date (press Enter for today): March 2024

## 15.2 Media Selection Examples

### 15.2.1 URL-based Media

#### Different URL Types

[Slide1] Media selection:

1. Enter a URL
2. Use an existing file from media\_files folder
3. Create slide without media

Your choice (1/2/3): 1

Example URLs:

1. Static Image:

Enter URL: [https://example.com/quantum\\_diagram.png](https://example.com/quantum_diagram.png)

2. Animated GIF:

Enter URL: [https://example.com/quantum\\_animation.gif](https://example.com/quantum_animation.gif)

3. YouTube Video:

Enter URL: [https://youtube.com/watch?v=quantum\\_explanation](https://youtube.com/watch?v=quantum_explanation)

4. Direct Video:

Enter URL: [https://example.com/quantum\\_demo.mp4](https://example.com/quantum_demo.mp4)

### 15.2.2 Local File Examples

#### Local File Selection

[Slide2] Media selection:

1. Enter a URL
2. Use an existing file from media\_files folder
3. Create slide without media

Your choice (1/2/3): 2

Available files in media\_files folder:

1. quantum\_states.png
2. superposition\_demo.mp4
3. entanglement.gif
4. measurement\_results.jpg

Enter file number or name: 2

## 15.3 Content Formatting Examples

### 15.3.1 Basic Content

#### Simple Bullet Points

[Slide1] Content (enter empty line to finish):

- Introduction to quantum states
- Superposition principle
- Quantum measurement

[Enter blank line]

### 15.3.2 Content with Special Characters and Math

#### Content with Special Characters and Math

```
[Slide2] Content (enter empty line to finish):
- Schrödinger's equation:  $i\hbar\frac{\partial}{\partial t}\Psi = \hat{H}\Psi$ 
- Measurement probability:  $|\psi|^2$ 
- Temperature range: -273.15°C to 100°C
[Enter blank line]
```

## 15.4 Footnote Examples

### 15.4.1 Simple Attribution

#### Basic Footnote

```
[Slide1] Footnote (press Enter to skip): Data from NIST 2024
```

### 15.4.2 URL Footnote

#### URL in Footnote

```
[Slide2] Footnote (press Enter to skip): https://quantum.example.com/data
```

### 15.4.3 Complex Footnote

#### Complex Footnote

```
[Slide3] Footnote (press Enter to skip): Adapted from Smith et al. (2024) and \url{http://example.com}
```

## 15.5 Complete Slide Examples

### 15.5.1 Static Image Slide

#### Complete Static Slide Example

```
\title Quantum States Overview
\begin{Content} \file media_files/quantum_states.png
- Understanding quantum superposition
- Properties of quantum states
- Measurement effects
\footnote{\tiny Based on "Quantum Mechanics" by Nielsen & Chuang}
\end{Content}
```

### 15.5.2 Playable Media Slide

#### Complete Video Slide Example

```
\title Quantum Evolution
\begin{Content} \play \file media_files/evolution_demo.mp4
- Time evolution of quantum states
- Interference patterns
- Decoherence effects
\footnote{\tiny Click play to see quantum evolution simulation}
\end{Content}
```

### 15.5.3 Text-Only Slide

#### Slide Without Media

```
\title Key Conclusions
\begin{Content} \None
- Quantum advantage demonstrated
- Practical applications identified
- Future research directions
\footnote{\tiny Research supported by ICQIST grant #2024-01}
\end{Content}
```

## 15.6 Generated File Structure

Here's how a complete file looks with various configurations:

### Complete Example File

```
\documentclass[aspectratio=169]{beamer}
[... preamble ...]

\title{Quantum Computing Advances}
\subtitle{Recent Developments}
\author{Dr. Sarah Johnson}
\institute{\textcolor{mygreen}{International Center for Quantum Information
Science and Technology}}
\makeatletter
\def\insertshortinstitute{ICQIST}
\makeatother
\date{\today}

\begin{document}

\begin{frame}
\titlepage
\end{frame}

\title Introduction
\begin{Content} \file media_files/quantum_basics.png
- Quantum computing fundamentals
- Current state of the field
- Recent breakthroughs
\footnote{\tiny Based on arXiv:2024.01234}
\end{Content}

\title Quantum Circuits
\begin{Content} \play \file media_files/circuit_simulation.mp4
- Gate operations
- Circuit design principles
- Measurement techniques
\footnote{\tiny Click to play simulation}
\end{Content}

\title Future Directions
\begin{Content} \None
- Scaling challenges
- Error correction
- Commercial applications
\footnote{\tiny ICQIST Research Roadmap 2024}
\end{Content}

\end{document}
```

## 15.7 Tips for Configuration

- Use short institute names for better footer readability
- Consider line breaks in institution names for better formatting
- Test media playback with different viewers

- Use descriptive filenames for media
- Include attribution in footnotes where appropriate
- Balance text content with visual elements

## 16 Future Enhancements

Planned features for future releases:

- Advanced preview frame customization
- Additional media format support
- Enhanced audio visualization
- Automated media optimization
- Custom preview frame selection
- Batch media processing tools
- Theme customization options
- Direct PDF compilation
- Template management