PSERC Academy: A Virtual Library of Short Videos (4.2)

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Overall Objectives

• Create an online library of short (10-15 minute) videos on various topics in sustainable energy systems, power electronics, and power engineering

• The vision is to eventually develop several hundreds or even thousands of such videos that will serve as a major online reference source
Workforce Need and Target Audience

• Difficulty in offering specialized university courses in the broad area of power engineering
• Need to accommodate different paces of learning among students
• Limited flexibility in traditional course delivery

• Target audience include university students in power engineering and related fields, as well as practicing engineers
Description

• Topics cover major aspects of power engineering and sustainable energy systems in clearly defined modules, complementing university courses

• Initial modules
  • Power electronics
  • Photovoltaics systems and grid integration
  • Grid integration of wind energy

• A wide range of delivery methods including
  • Power-point lectures with audio narration
  • Interactive animations, simulations, movie clips
  • Online exercises, and online peer-to-peer correspondence, feedback
Screencast method for videos

- Screencast techniques using *Adobe Captivate*
- Easy to use a variety of tools including power point, simulations, animations and other programs

Screencast process

- Generates the switching signals for driving the power devices
- Impacts switching losses and high frequency distortion
- Carrier based methods (sine-triangle comparison)
- Space vector modulation methods for three-phase

Sample outcomes of screencasting

*Example: Single phase PV inverter*

*Pulse-width modulator*
Sample YouTube videos
Highly User Interactive Animations
Power Electronics and Systems Simulations

- PLECS simulation files to be made available through the PSERC Academy website
- Working with Plexim (developers of PLECS) to offer these as ‘Demo files’ for public use with some restrictions on circuit modifications, saving changes etc.
Interactive Quizzes

Multiple Choice

In a boost dc-dc converter, if \( V_{\text{in}} = 10 \) V, and \( d = 0.75 \), then \( V_0 = ? \)

- A) 13.33 V
- B) 40 V
- C) 7.5 V
- D) -13.33 V

Quiz Result

Your Score: 30
Max Score: 40
Questions Correct: 3
Number of Questions: 4
Accuracy: 75%
Number of Quiz Attempts: 1

Congratulations, you passed

Continue  Review Quiz
Accessing the Materials: PsercAcademy.asu.edu

- Dedicated website with search and interactive features with the video links (YouTube), lecture material, simulations and animations
Plans for Future Use

• Open access to PsercAcademy.asu.edu by end of Q2, 2013 with initial modules on power electronics and PV systems
• Obtain feedback from PSERC community and outside, and refine the style and contents of videos and other material
• Integrate into the Power Electronics and Renewable Energy courses at ASU beginning Fall 2013
• Seek funding for sustaining the initiative
• Seek partners for developing videos on other aspects of sustainable energy systems