Project Year
2011-2012

Project Title
Online Tutorial for MATLAB

Project Team
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Audience
Students in Biomedical Engineering courses requiring the use of MATLAB.

Pedagogical Issue
The Biomedical Engineering Program requires students to complete many of their homework assignments using MATLAB. There is no formal course to teach MATLAB, and students often struggle to use this mathematical tool for course work as they are learning it. As well, many of the faculty in BME use MATLAB for their research and expect students to be proficient in order to contribute to the lab's progress.

Solution
We propose to develop an online course which will guide our BME students through MATLAB basics, eventually teaching them more advanced programming concepts. The course would be divided into units covering such topics as basic arithmetic operators, matrix indexing, vector computations, loops, functions, and plotting graphs, among others. This online MATLAB course would be a recommended prerequisite for a number of BME classes.

Technologies Used
Digital Audio & Video, Animations/Simulations, Adobe, Blackboard, MatLab, HTML, Java, Graphic Design

Project Abstract
With the rapid growth of technology comes a need for scientists to be familiar with commonly used software packages. An understanding of the most widespread uses of these packages is an essential part of any professional's skill set. One of the most versatile tools, MATLAB, has seen a rise in popularity recently due to its convenience and prototyping ability. As a result, much of current engineering curriculum requires MATLAB proficiency. However, there are few resources available for students with limited technical background in MATLAB to learn the basics of this software package. Therefore, we propose an online tutorial to address this issue.

We researched several software programs for creating tutorials and decided that CamStudio and Wink are most suitable for this project. Both programs are free for personal and business projects. They are easy to use and have many features (including audio recording) that similar commercial programs offer.

We plan to start with one or two basic tutorials that demonstrate how to do basic arithmetic operators, matrix indexing, and vector computations in MATLAB. After creating and reviewing these basic tutorials, we will move on to more advanced topics such as programming syntax, writing and distinguishing between scripts and functions, constructing loops, and plotting graphs. Finally, we can include a seminar for students interested in more advanced topics such as data file writing processing and data structures/typing. For each tutorial, there will be a post-tutorial problem set where students will be able to apply concepts and materials that are taught in the tutorial.