## CER Technology Fellowship Program –2008

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*Project Title:* Development of Online Resources for the BME Signals Course

*Audience:* Students taking *Biomedical Systems and Control (580.222)* – a signals and controls course with a heavy emphasis on biomedical engineering perspectives.

*Pedagogical Issue:* Introductory signal processing theory is traditionally approached from an electrical engineering perspective and geared towards students with interests in electronics and/or a background in algorithmic thinking. Yet an understanding of signal theory is equally important for biomedical engineers and required coursework for sophomore BME majors at Johns Hopkins.

*Solution:* In this technology development project, we propose to improve the online educational material for the signals course by targeting explanations and examples to the specific interests and backgrounds of young biomedical engineers. Dr. Miller has developed a wealth of lecture notes, TA session notes, and review problems. However, this material is not currently organized or presented in a manner accessible for students. Before this material can be widely disseminated, we will establish a flexible online framework so the content can be accessed in a consistent manner and new material from future courses can be readily integrated. The existing content will be appropriately edited for clarity and integrated into the online framework. Animated and simulation examples will be developed in Matlab to give students hands-on experience with abstract concepts.

*Technologies Used:* Animation, C/C++, WebCT, HTML/Web Design, JAVA, MatLab, PowerPoint

*Project Abstract:* Introductory signal processing theory is traditionally approached from an electrical engineering perspective and geared towards students with interests in electronics and/or a background in algorithmic thinking. Yet an understanding of signal theory is equally important for biomedical engineers and required coursework for sophomore BME majors at Johns Hopkins. In this technology development project, we propose to improve the online educational material for the signals course by targeting explanations and examples to the specific interests and backgrounds of young biomedical engineers.

Dr. Miller has experience approaching signal theory from a BME perspective through *Signals and Controls (580.222)*, a course which he has taught since 2003. Dr. Miller has developed a wealth of lecture notes, TA session notes, and review problems. However, this material is not currently organized or presented in a manner accessible for students. Before this material can be widely disseminated, we will establish a flexible online framework so the content can be accessed in consistent manner and new material from future courses can be readily integrated. The existing content will appropriately edited for clarity and integrated into the online framework. Animated and simulation examples will be developed

in Matlab to give students hands-on experience with abstract concepts. The success of this single semester project will be assessed through an online survey of the students experience with the new online material.

*Project Web Site:* http://www.jhu.edu/bmesignals/