C3PO: Customizable Computer Coaches for Physics Online

Problem-solving plays a crucial role in introductory physics. However, most introductory physics students are not skilled enough in problem-solving to use it effectively as a learning tool. These students need coaching to improve their problem-solving skills as they learn physics. In the past 30+ years at the University of Minnesota, integrating problem-solving in the classroom has shaped the pedagogy and structure of how the introductory physics courses. As part of the current curriculum, students are coached in solving physics problems by teaching assistants and instructors, primarily in the classroom. Computers are a potential tool to also provide this coaching since they are patient, non-threatening, and available 24/7 over the Internet. This talk will describe the underlying pedagogical models which are used to develop the online coaches and how they fit into the overall existing course structure. The utility and educational impact of the coaches as used in the first semester of large calculus-based physics at the University of Minnesota will be explored. Also, this talk will address how the results of this implementation are being used as input to the design of the second version of these coaches called C3PO: Customizable Computer Coaches for Physics Online. This work was partially supported by NSF DUE-0715615 & 1226197.

Wednesday, March 4
2:00 - 3:00 p.m.
RNS 210
Cookies and Apple Cider Served!

Evan Frodermann ‘02

Evan Frodermann, a Physics and Mathematics major, graduated from St. Olaf College in 2002 with a physics distinction. After St. Olaf, driven by his undergraduate research experiences, Dr. Frodermann attended graduate school at The Ohio State University (OSU) where he earned his physics Ph.D. in 2008. Dr. Frodermann’s research thesis was on theoretical nuclear physics, particularly in phenomenological models of heavy-ion collisions. After graduate school, Dr. Frodermann became a post-doctoral research assistant in nuclear physics at the University of Minnesota (UMN). In his career, Dr. Frodermann has had strong academic interests in physics education which was further cultivated as a teaching specialist and lecturer at UMN. Dr. Frodermann is currently a post-doctoral research associate in the Physics Education Research and Development group (http://groups.physics.umn.edu/physed/) at the University of Minnesota exploring pedagogy and student learning. His particular interests are on how students develop problem-solving skills in introductory physics courses using online resources.