Weldon Lodwick (Univ. of Colocado at Denver, EUA)

Título: *A Perspective of University-Industry Collaboration – A Pedagogical Approach*

Resumo: This presentation will focus on how to bring actual applied mathematical problems from industries and institutions into the classroom to be researched with a solution, hopefully, returned. This pedagogical instrument of training graduate and undergraduate students in applied mathematics, not only prepares students for jobs in applied mathematics, it is an exercise in applied mathematical research beneficial to the sponsoring industry/institution and also serving for masters and PhD topics as well as research articles. This is a regularly scheduled three hours per week, fifteen week class, called the mathematics clinic given each semester (sometimes we have 2 clinics in a semester), which is required by all undergraduate mathematics students and PhD students. The mathematics clinic is a distinguishing feature of our department. I will present the 30 year experience of the mathematics department at the University of Colorado Denver of which I have been a part from the first one in 1982, 15 years as the director of the program, with examples of various clinics. The outline of the presentation is as follows:

1. Introduction – what is a mathematics clinic, how do we obtain problems?
2. The structure of the clinic – how a mathematics clinic is run?
3. Our experience
   a. Our first clinic (1982) – Three Mile Island Nuclear Power Plant Disaster, parallel computer implementation of simulations, Delcor Computers and US Department of Energy
   b. Various clinics
      i. Plant Variety Protection - USDA
      ii. Lockheed-Martin Vehicle Launch Unit – optimal Uranus probe design
      iii. Lockheed-Martin – the use of neural networks to control rocket launches
      iv. A Sewer System Geographic Information System – South Suburban Sanitation District No. 1, Centennial, Littleton, and Englewood, Colorado
      v. Trash collection and snow mashing routing problem – City of Denver
      vi. Radiation Therapy of Cancer Tumors – Computerized Medical Systems (St. Louis, Missouri) and University Hospital Radiation Oncology unit
      vii. Intelligent Mathematical Programming Systems – Shell Oil, Amoco (now BP)
      viii. Medical Image Processing – National Jewish Lung Hospital, Denver
      ix. Democratic National Convention 2008, security monitoring – Democratic Party
      x. Others

4. What does an industry or institution gain?
5. What does the university, department, student gain?
6. My point of view of the possibilities of university/industrial collaboration in Brasil after a year at UNESP-SJRP
   a. Non-pedagogical Approach – A talk with Professor Marcus Rocha, Univ. Federal do Para
   b. Pedagogical Approach – Experience with UNESP-SJRP and Hopstital de Câncer de Barretos, "Escala de médicos" (unidade de radioterapia)
7. Concluding remarks