Proposal for new
CACHE Task Force
on
Computing, Biosystems, and Chemical Engineering Education

Task Force Organizers
Frank Doyle - *University of Delaware*
Sangtae Kim - *Eli Lilly*

Summary Statement

In recognition of the changing nature of the chemical engineering discipline, a task force is proposed to address the new challenges in computing in chemical engineering education that arise in the areas of biosystems (functional genomics, bioinformatics, proteomics, computational biology, pattern discovery, systems biology, etc.). The timing is critical, many of the major chemical engineering departments in the U.S. are revising their undergraduate curriculum to address new technological challenges in biosystems. At the same time, industry is looking to recruit chemical engineering graduates with combined skills in computing/modeling and biosystems.

At the present time, CACHE does not have a focused effort in this area, owing largely to a lack of trustees in the bio area. This task force would aim to take on the challenge of archiving or creating computer-based modules for biological problems that can be integrated into traditional core courses (mass balance, thermo, fluids, control, design, etc.). Some such modules already exist in the CACHE products portfolio. More ambitious objectives may be possible with leveraged NSF funding (mirroring the successes of the molecular modeling task force).

This task force will address means for involving the present (and potential future) industrial affiliates in this task force activity. With Sangate Kim as a co-organizer, we can reach Lilly. Other likely collaborators include Dow, Merck, and DuPont. Industrially motivated problems would be a valuable contribution to any module development.

A side benefit of this activity would be the recruitment of energetic new trustees in the bio area. There is also a significant professional development opportunity for the members of this task force as they take a role in shaping education in this emerging area.

Related Synergistic Activities

- AIChE has an initiative at the Board level to examine the future of biotechnology & bioengineering (Sangtae Kim is on that committee)

- There was a session at the 2002 Annual Meeting on Bioinformatics in Chemical Engineering Education (co-chaired by Frank Doyle)

- Bioengineering sessions at the recent ASEE Summer School for ChE Faculty
  The CACHE website is accumulating content in bioengineering curriculum

Current Status

1. In addition to Frank Doyle and Sangtae Kim, the following individuals have been suggested for the proposed task force, and each has agreed to serve on the ad hoc committee:

   Professor Vassily Hatzimanikatis, Northwestern
   Professor Mike Henson, U. Massachusetts
   Dr. Bob Leipold, Entelos
   Professor Costas Maranas, Penn State
   Professor Babatunde Ogunnaike, U. Delaware
   Dr. Julia Ross, U. Maryland Baltimore County
   Dr. Chen Su, Eli Lilly

2. An initial meeting convened at the 2002 AIChE Annual Meeting. Brainstorming on the question of curriculum content was followed by the suggestion of identifying 2-3 computational modules that would be effective for several of the core undergraduate courses in the chemical engineering curriculum. The group is currently preparing a list of sample modules for the following core courses:

   Separations
   Reaction Engineering
   Process Control
   Process Design

3. Findings will be reported at the Summer Trustees meeting, along with a formal proposal for the task force.