Linking SDSU Computational Science and Industry

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### Why? Mutually beneficial

<table>
<thead>
<tr>
<th>SDSU benefits</th>
<th>Industry benefits</th>
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<tbody>
<tr>
<td>Expose students to “real-world” problems</td>
<td>Source of well-trained new employees</td>
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<tr>
<td>Additional source of support for students</td>
<td>Access to specialized academic firepower and resources</td>
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SDSU computational science resources

- Wide range of faculty from mathematics, science, and engineering spanning a variety of specialties (fluid dynamics, materials science, biophysics, bioinformatics, signal processing, data mining, computational and numerical expertise)

- Ph.D and M.S. students

- Computational resources (e.g. cluster, visualization)
How? Multi-tiered strategy

• Develop classes designed to streamline transition to industry (enhance teamwork, problem-solving, and communication skills) (no cost to industry)

• Provide access to faculty/student teams for specific problems ($)

• Develop focused consortiums with multiple faculty and associated students ($)
Example: class development

- Computation Sciences 670
  - Intended to mimic industry environment
  - Small group of students address a specific problem and write report
  - Faculty act as consultants
  - Enhance teamwork and flexibility
  - Objectives based in part on previous comments during ACSESS meetings
Sample problems

• Time series analysis and signal detection in noise.
• Numerical modeling of spark plasma sintering
• Analysis of customers preferences (Netflix)
• We will accept problems from industry (no charge)
Example: Sintering

Tasks:
- Solve sintering problem using finite difference
- Write documentation
- Presentation (powerpoint & poster*)

Images courtesy of
M. Abouali
S. Akhter
C. Garcia
B. Runyan
R. Schmieder
D. Torres

*poster is displayed here
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Faculty/student teams

• Provide support for a specific student(s) to work on a problem.
• Includes some allocation for faculty and computer resources.
• May form part of a student thesis
• One summer ~ $10,000
Consortium

- Research on a given problem supported by yearly fees (for example, seismic wave imaging).
- Gain access to latest results and codes.
- Yearly workshop to show results.
- Need group of companies.
Conclusions

• Industry participation is essential for success.
• Beneficial to industry as well.
• Wide range of options with considerable flexibility.
• Contact me with questions or comments

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