## CSE 461 – Spring 2008

### Fault-Tolerant Parallel Computation

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<tr>
<th><strong>Instructor:</strong></th>
<th>Alex Shvartsman</th>
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<th><strong>Schedule:</strong></th>
<th>Tuesday and Thursday, 3:30 – 4:45 pm. Bronwell 124</th>
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<th><strong>Office Hours:</strong></th>
<th>Tuesday, 1:00 to 2:30 pm and by appointment. Walk ins are welcome.</th>
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- There will be supplementary handouts for selected topics. |
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| **Topics:** | - Shared-memory and message-passing paradigms of parallel computation
- Fault-tolerant computation and failure models
- Complexity measures: time, space, work, rounds, concurrency, overhead
- Principles of fault-tolerant computation
- Efficient and fault-tolerant parallel algorithms; the Write-All/Do-All problems
- Synchrony and asynchrony
- Lower bounds and techniques
- Simulating one synchronous parallel step on failure-prone multiprocessors
- Fault-tolerant algorithm simulation and transformation
- Controlling memory access concurrency
- Basic fault-tolerant message passing algorithms
- Safety and liveness
- Emulating shared memory in message-passing systems |
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| **Structure and Grading:** | Major part of the course consists of formal lectures. The last few weeks may include research paper presentations by students (extra credit) and discussion, and overview of advanced research topics. There will be homeworks, a midterm and a final. The final grade will be based on:
- 50% homeworks
- 20% midterm
- 30% final (possibly take home)
- Paper presentation (for extra credit – based on class size) |
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