Distributed Computing and Fault Tolerance

Spring 2021 (Preliminary)

Instructor:	Alexander Schwarzmann	Tel: 721-0989	Email: `aschwarzmann@augusta.edu`
Schedule:	TBD		
Office Hours:	TBD based on student/instructor schedules By appointment, but walk-ins are welcome.		

Reading:	• Paper and/or online supplementary handouts will cover most of the topics.
	• Optional extended reading:
	  ○ Ch. Georgiou and A. Shvartsman, *Cooperative Task-Oriented Computing: Algorithms and Complexity*, Morgan & Claypool, 2011
	  ○ Ch. Georgiou and A. Shvartsman, *Do-All Computing in Distributed Systems: Cooperation in the Presence of Adversity*, Springer Verlag, 2008		

Topics will be drawn from:	• Shared-memory and message-passing paradigms of distributed computing • Fault-tolerant computation and failure models • Complexity measures: time, space, work, rounds, concurrency, overhead • Correctness: safety and liveness • Efficient and fault-tolerant parallel algorithms • Do-All paradigm for distributed cooperation • Synchrony and asynchrony; Lower bounds and techniques • Simulating synchronous parallel steps on failure-prone multiprocessors • Fault-tolerant algorithm simulation and transformation • Atomic / linearizable storage systems • Emulating shared memory in message-passing systems • Basic fault-tolerant distributed algorithms		
Structure and Grading:	Major part of the course consists of formal lectures. The last two weeks may include research paper presentations by students (extra credit), and overview of advanced research topics. There will be homeworks, a midterm (tbd) and a final. Homework Collaboration Policy: You may discuss homework problems and work with your classmates, however your write-up *must* be done on your own. If you obtain *any* part of your solutions with the help of others or of other sources, you *must* identify the sources/people on your submitted homework. The final grade will be based on: • 30% homeworks • 70% tests/final (final (possibly take home) • Paper presentation (for extra credit – based on class size) University policies on Academic Integrity will be enforced.		