Welcome to Sarah Day's home page.

Math 490: Seminar on Computational Dynamics and Topology

Spring 2008

course advertisement

Meeting time: MW 9:00-10:20
Meeting place: Morton 4

Office: 133, Jones Hall
Office Hours: Mondays 10:30-11:30, Thursdays 2:30-3:30, or by appointment

Grading:
20% class participation
20% homework and evaluations
20% presentations
40% project

Announcements:

Note schedule changes below.

Final projects are due at the beginning of the scheduled final exam period: Friday, May 2, 8:30-11:30.

Links and References:

Dynamics:

cobwebbing fun

Dynamical Systems at Wikipedia

Chaos: An Introduction to Dynamical Systems, by Alligood, Sauer, and Yorke (book)

Nonlinear Dynamics and Chaos, by Strogatz (book)

Software for the Global Analysis of Invariant Objects (GAIO)

Computational Topology:

Computational Topology at Wikipedia

Topology at Wikipedia

Computational Homology, by Kaczynski, Mischaikow, and Mrozek (book) (synopsis/review)

Algebraic Topology, by Hatcher (book)

A talk by M. Schatz: Homological characterization of complex spatiotemporal patterns

A movie from the webpage of Evelyn Sander:
Spinodal Decomposition: A pictorial view of the formation of binary alloys

Computational Homology Project, CHomP

Schedule:

Date	Material	Presenter(s)	Comments
1/16 (W)	organizational meeting, project ideas	S. Day	see links and references above survey, presentation comments, synopsis due next meeting
1/21 (M)	MLK DAY/NO MEETING		
1/23 (W)	organizational meeting,	S. Day	see links and references above synopsis, presentation comments due next meeting

	project ideas		
1/28 (M)	one-dimensional maps	Alex Penney	pre-proposal due
1/30 (W)	GIS and topology	Erin Gnass	Erin's GIS slides are available on the course Blackboard site (under Course Documents).
2/4 (M)	winding numbers and the Borsuk lemma	Matt Goldman	proposal due
2/6 (W)	short organizational meeting		
2/11 (M)	canceled	Brian Ball	to be rescheduled
2/13 (W)	heart data and an intro to computational homology	Taylor Short	By the end of the day, please send a list of the fridays this semester that you are *not* available to meet (9-10:20).
2/18 (M)	fractals	Jemma Moore	Jemma's slides are available on the course Blackboard site (under Course Documents).
2/20 (W)	computational homology, part II	Corey Miller	
2/25 (M)	game theory	Drew Hughes	
2/27 (W)	time series analysis	Brian Ball	
2/29 (F) *	fractals II	Jemma Moore	* Meeting in Morton 239.
3/3 (M)	SPRING BREAK/NO MEETING		
3/5 (W)	SPRING BREAK/NO MEETING		
3/10 (M)	game theory II	Drew Hughes	
3/12 (W)	the ham sandwich theorem	Matt Goldman	
3/17 (M) *	CANCELLED		
3/19 (W) *	CANCELLED		
3/21 (F) *	the boudary operator and GIS	Erin Gnass	* Meeting in Morton 239.
3/24 (M)	time series analysis II	Brian Ball	
3/26 (W)	computational homology	Taylor Short	
3/31 (M)	computational homology	Corey Miller	
4/2 (W)	dynamics	Alex Penney	
4/4 (F) *	2-d and discrete ham sandwich theorems	Matt Goldman	* Meeting in Morton 239.
4/7 (M)	game theory III	Drew Hughes	
4/9 (W)	period three implies chaos	Alex Penney	
4/14 (M)	computational homology in action	Corey Miller	
4/16 (W)	computational homology and spiral waves	Taylor Short	
4/18 (F) *	applications of time series analysis	Brian Ball	* Meeting in Morton 239.
4/21 (M)	the mandelbrot set and julia sets in more detail	Jemma Moore	
4/23 (W)	computational homology and GIS	Erin Gnass	