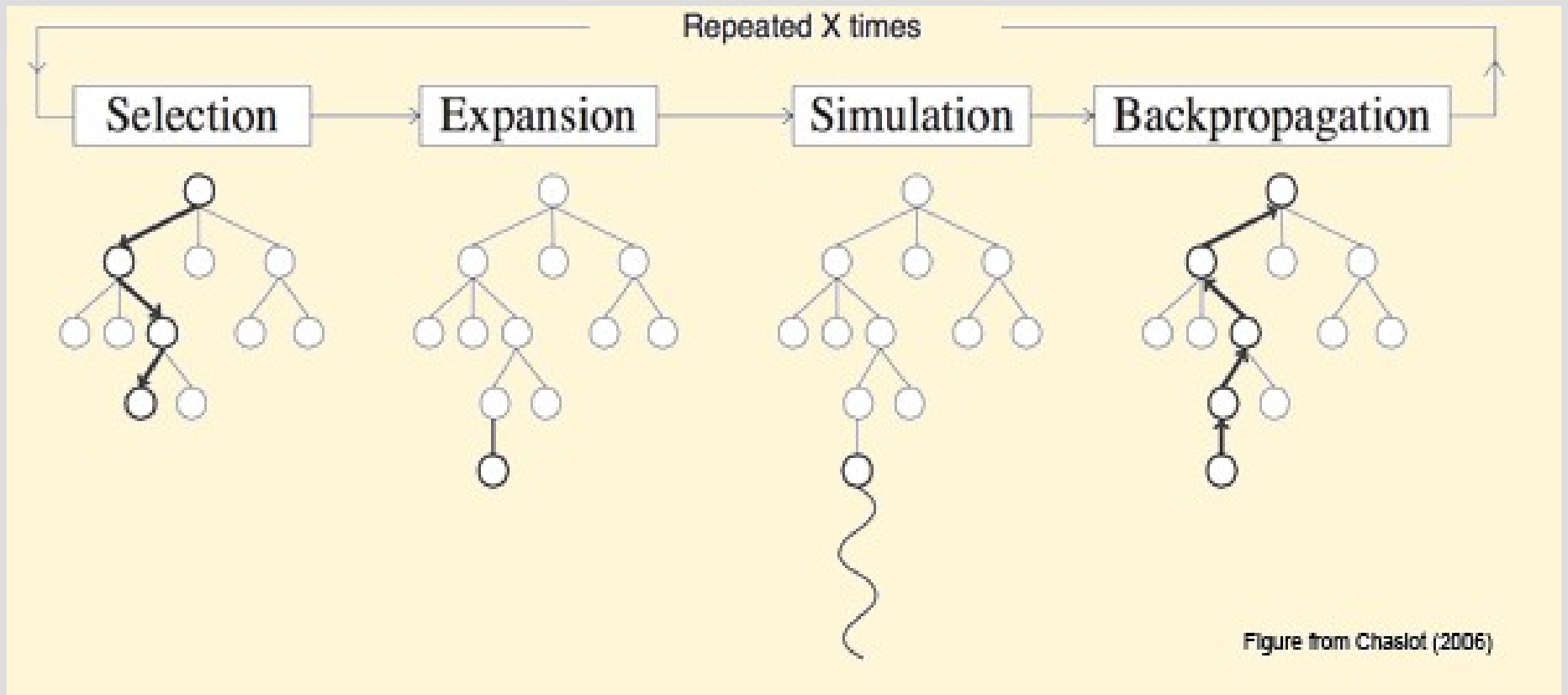


Welcome to CSci 4041

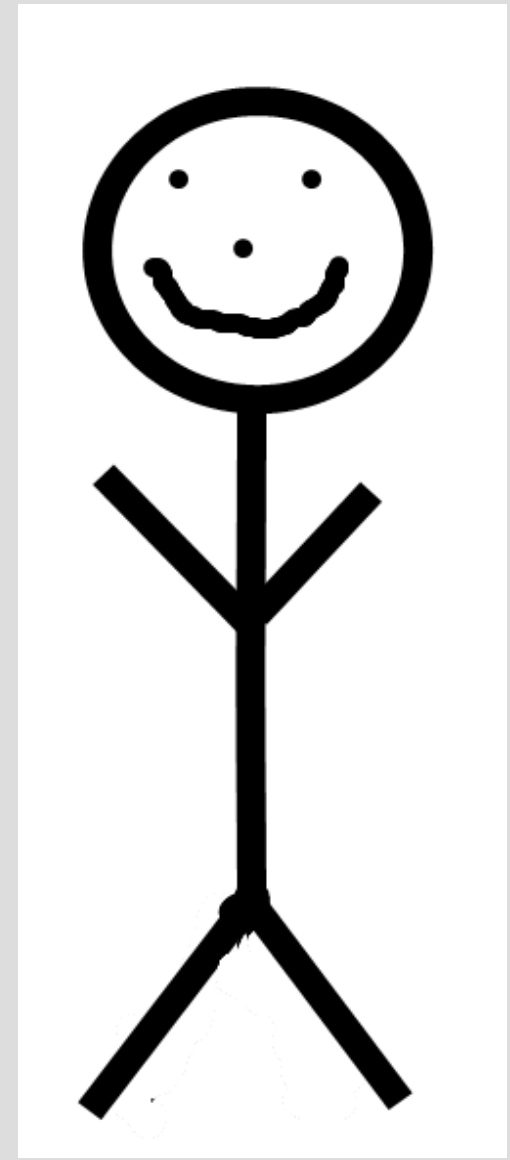
Algorithms and Data Structures



Instructor (me)

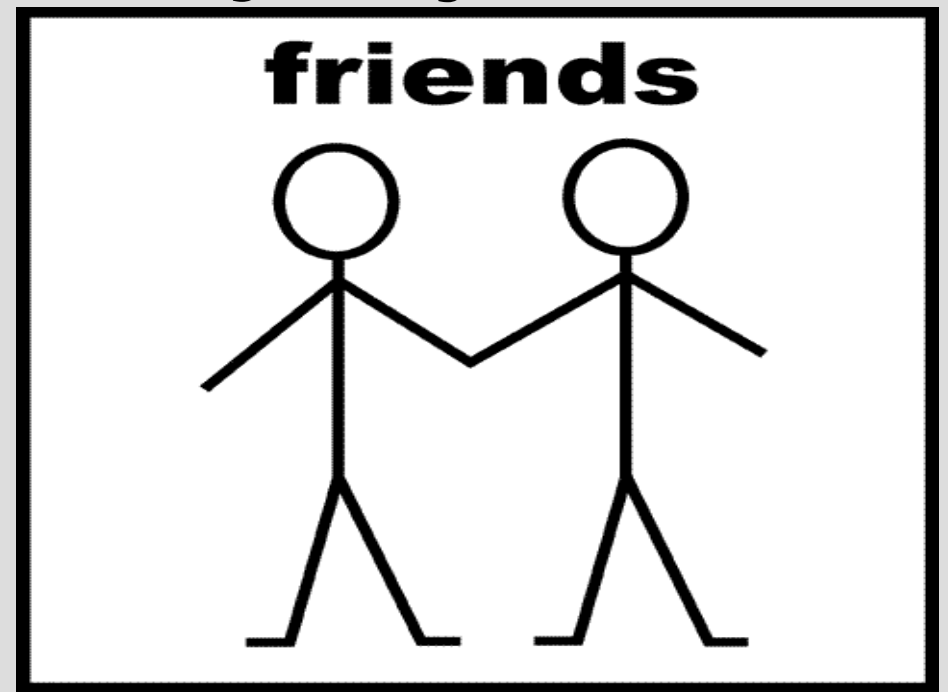
James Parker
Shepherd Labs 391

Primary contact:
jparker@cs.umn.edu



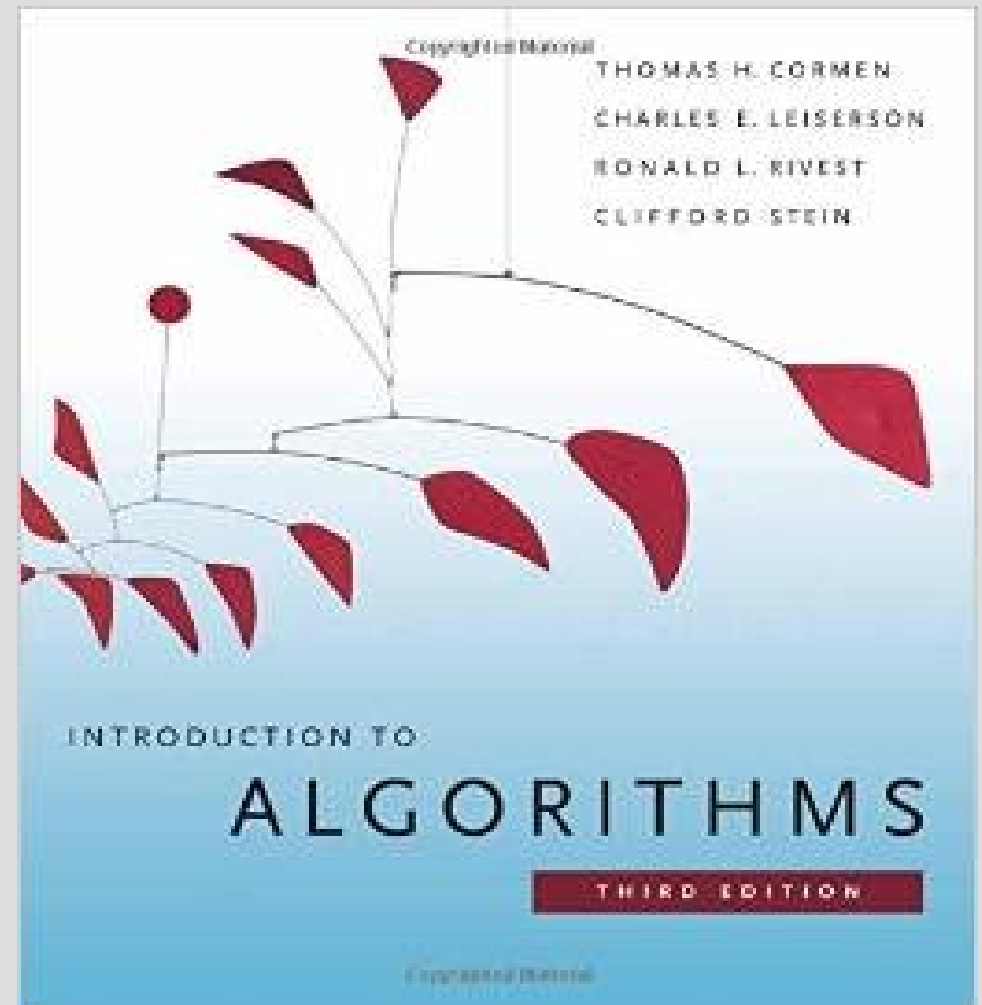
Teaching Assistant

Pariya Babaie, Jayant Gupta,
Song Liu, Anoop Shukla,
Nikolaos Stefas, Kshitij Tayal
Nitin Varyani



Textbook

Introduction to
Algorithms,
Cormen et al.,
3rd edition



Discussion sections

No discussion on Friday
(don't come, no one will be there)

These will typically reinforce the
topics of the week (or exam review)

The TAs may do exercises, so
bring something to write on

Class website

www.cs.umn.edu/academics/classes

Or google “umn.edu csci class”

Syllabus, schedule, other goodies

Moodle page will have grades and
Possibly homework submission

www.cs.umn.edu

CSci 4041H: Announcements - Mozilla Firefox

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http://www-users.cselabs.umn.edu/classes/Fall-2015/csci4041H/

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Home
Office Hours
Schedule
Syllabus
Moodle (grades)

CSci 4041H: Algorithms and Data Structures

Class Announcements

- 09/08/2015
ALL YOUR BASE ARE BELONG TO US.

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Find: Next Previous Highlight all Match case

Done

Syllabus

30% Homework

20% Programming assignments

25% Midterm (Oct. 24)

25% Final (Dec. 16)?

(No late homework; must ask for extension 48hr before deadline)

Syllabus

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	Dec 1	2
3	4 Class	5	6	7	8	9
10	11	12	13	14	15	16 Final
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	Jan 1	2	3	4	5	6

Syllabus

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	Dec 1	2
3	4	5	6	7	8	9
	Class					
10	11	12	13	14	15	16
		Final				Final
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	Jan 1	2	3	4	5	6

Syllabus

30% Homework

20% Programming assignments

25% Midterm (Oct. 24)

25% Final ~~(Dec. 16)?~~ (Dec. 12)

(No late homework; must ask for extension 48hr before deadline)

Programming vote

C/C++?

Java?

Python?

Syllabus

Grading scale:	77% C+
93% A	73% C
90% A-	70% C-
87% B+	67% D+
83% B	60% D
80% B-	Below F

Schedule

Ch. 1, 2, 3: Introduction

Ch. 2.1, 2.3, 7, 8: Sequences and Sets

Ch. 6, 9, 13, 32: More Sequences and Sets

Ch. 22, 23, 24, 25, 26: Graph Algorithms

Ch. 33: Geometric Algorithms

Ch. 4.2, 30, 31: Algebraic and Numeric Alg.

Ch. 34: NP-Completeness

Syllabus

Any questions?

Course overview

Major topics:

- Learn lots of algorithms
- Decide which algorithm is most appropriate
- Find asymptotic runtime and prove an algorithm works (mathy)

Algorithms

We assume you can program

This class focuses on improving your ability to make code run faster by picking the correct algorithm

This is a crucial skill for large code

Algorithms

We will do a pretty thorough job of sorting algorithms

After that we will touch interesting or important algorithms

The goal is to expose you to a wide range of ways to solve problems

Algorithms

Quite often there is not a single algorithm that always performs best

Most of the time there are trade-offs:
some algorithms are fast,
some use more/less memory,
some take use parallel computing...

Algorithms

A major point of this class is to tell how scalable algorithms are

If you have a 2MB input text file and your program runs in 2 min ... what if you input a 5MB file?

... 20 MB file?

Algorithms

In addition to using math to find the speed of algorithms, we will prove algorithms correctly find the answer

This is called the “correctness” of an algorithm (and often will be proof-by-induction)

Next time...

Thursday will be a “review” of things you should already know (Ch. 3)

We will often have ungraded in-class exercises, so please bring something to jot notes on