Welcome to CS5200 :-)

Prof. Nate Derbinsky

My Path to Khoury @ Northeastern

1998-2009 **BitX Solutions, Inc.** Founder & President
- {.gov .edu .org .com} x {desktop web mobile}

2002-2006 **NC State.** BS Computer Science
- TA, DBMS

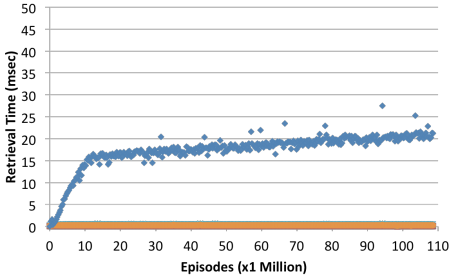
2006-2012 **U of Michigan.** MS/PhD Comp Sci and Eng
- TA, AI+DBMS

2012-2014 **Disney Research.** Postdoctoral Associate
- Machine Learning, Optimization, Robotics

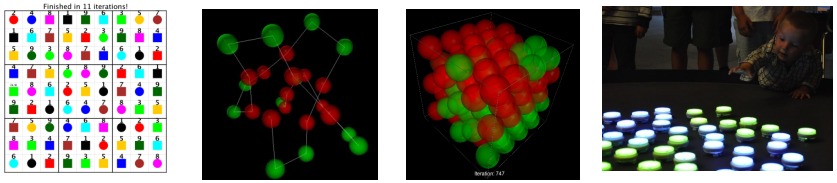
2014-2017 **Wentworth.** Assistant Professor
- 3-3, Research/Service Learning

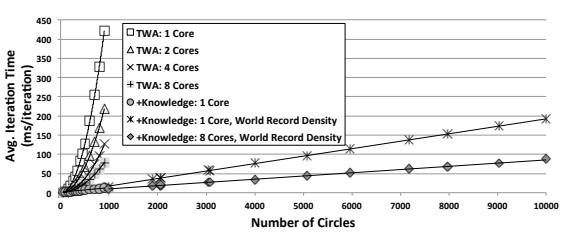
Research Interests

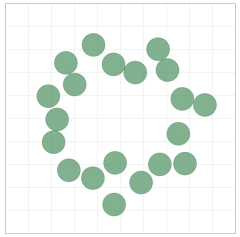
Cognitive Systems



Scalable Optimization

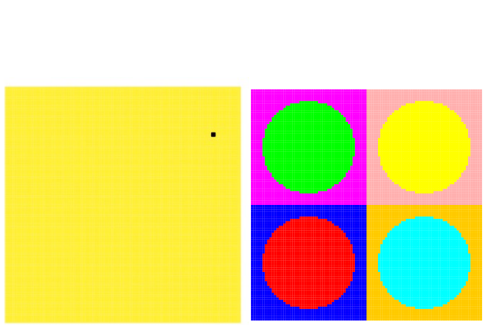


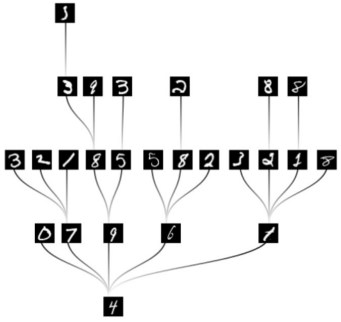




AI Applications/Education

Online ML





Teaching

K-12/ICT-D

UG/Grad

- CS1-4
  - Foundations, OOP, SE
- Databases, Web
- AI, Machine Learning
- HTMAA
  - RPi, Arduino

Livestream Modality

When Derbinsky in	MIA	✈️🌎❓
Lecture	Rm 506	Rm 506 (Teams w/ IA)
Office Hours	On-Campus	Zoom
Asynchronous Help	Email or Piazza (via Canvas)	

Syllabus

Accessible via Canvas…

https://northeastern.instructure.com/courses/212927

This Class

After this class, you should be able to…

- Use a relational database (via SQL and code)
- Design a secure, normalized, efficient database
- Understand (some of) how a DBMS works

Expectations of you

a) Work hard (really hard, it'll be worth it!)
b) Use resources (read book/materials before class, attend class, etc.)
c) Start assignments early (you'll need the time!)
d) Ask for help [if you've done a-c]

Course Overview

		HW	Project
Using a Database	What is a relational database?		
	How do I get data in/out of a database?	SQL.1	
	How do I create a DB? How to securely program with a DB?	SQL.2	
	Exam 1		Plan
Designing a Database	How do I evaluate a database design?	Norm	
	How do I design a database?	ERD/Map	
	How do I design for fast database apps? What is WebDev?	Index	
	Exam 2		Milestone
Internals	How does a DBMS handle multiple users?	Sched	
	How does a DBMS recover from failure?	Recover	
	Advanced Topics (research, ML)		Final

Lectures -> Learn

- Syntax
- Concepts, algorithms, tradeoffs
- I will try to include opportunities to ***do***

Attend ready to participate (e.g., ask great questions!)

- Up to 5% grade recovery

Homework (35%) -> Apply

- Solve problems, evaluate results

Guidelines

- Code + professionally typeset PDF
  - Via Canvas
- Discussion encouraged, but **all submissions must be individual**
  - *Absolutely no sharing code/work* 😡
- Typically due Wednesdays @ 1PM
  - 1 week *after* concepts covered
  - Late: 24 hours (allows for solution debrief in-class)

Exams (40%) -> Demonstrate

- Logically grouped, *mostly* independent
  - Exam 1 = Use, Exam 2 = Design
- Demonstrate basic understanding of concepts, apply to small problems
- On-paper, during class time (everyone remote)
  - More details later: 2/6, 3/20

Basic structure

- Review
- Exam
- Exam debrief

Project (25%) -> Synthesize

Hands-on experience with a database application, from requirements to GUI

- Design a database given specification
- Write queries to perform operations
- Develop user interface (i.e., app)
- Submit packet, presentation in-class

Start of discussion…

- Individual/pair
- Base project option vs custom proposal

Welcome to Databases!

It’s going to be a great semester :)