Welcome to CS3200 :-)

Prof. Nate Derbinsky

Getting to Know You!

- Now
  - Poll on https://northeastern.blackboard.com
    - "Background" under "Links"
    - Password: "SoCold" ❄
- Whenever you want :)
  - Come chat with me before/after class and/or during office hours

My Path to CCIS @ 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

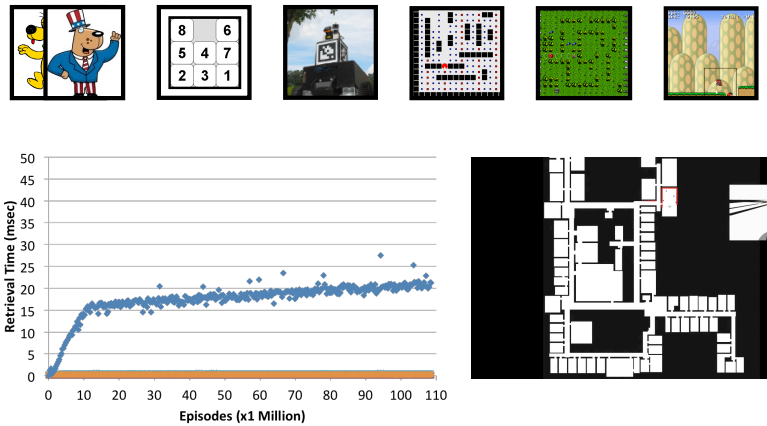
2006-2012 **U of Michigan.** MS/PhD Comp Sci and Eng
- TA, AI+DBMS

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

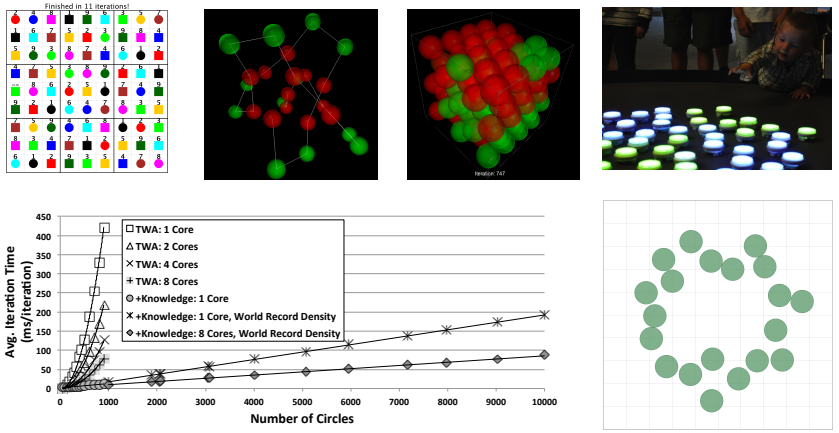
2014-2017 **Wentworth.** Assistant Professor
- 3-3, Research/Service Learning

Research Interests

Cognitive Systems

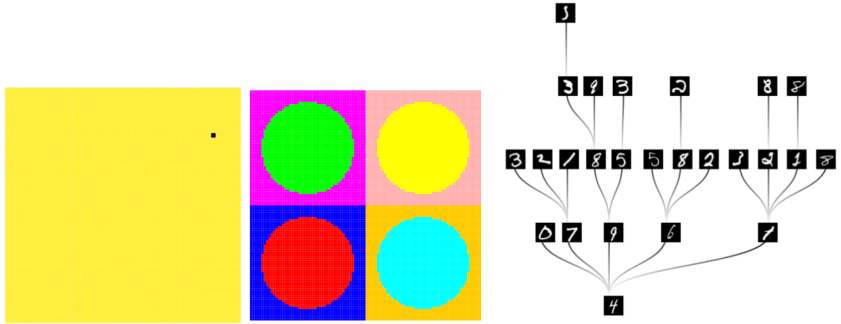


Scalable Optimization



AI Applications/Education

Online ML



Teaching

K-12/ICT-D

UG/Grad

- CS1/2
  - OOP, Foundations
- Databases, Web
- AI, Machine Learning
- HTMAA
  - RPi, Arduino

Syllabus

- Accessible via Blackboard (Under “Links”)
  - https://northeastern.blackboard.com
  - MyNEU
- https://course.ccs.neu.edu/cs3200sp18s3

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 makes up a relational database? (relational data model)		
	How do I get data in/out of a database? (SQL, relational algebra)	SQL.1	
	What is this NoSQL stuff? (MongoDB, Neo4j)	SQL.2	
	Exam 1		Intro
Designing a Database	How do I extract data constraints & relationships from req's? (ERD)	ERD	
	How do I design a database? (mapping, relations)		
	How do I evaluate a database design? (FDs, normalization)	Map/FD	
	Exam 2		WebDev
DB Apps/ Internals	How do I write secure database applications? (JDBC, attacks, salt)	App/Hack	ERD, Map, SQL
	How do I make a database app fast? (physical design, indexes)	Index	
	How a DBMS handles multiple users (concurrency, transactions)	Sched	
	Exam 3		Final

Lectures -> Understand

- Syntax
- Concepts, algorithms, math, tradeoffs

I will try to include opportunities to **do**

- Come ready to ask participate and ask great questions!

Homework (40%) -> Use

- Apply ideas from lecture
- Solve problems, evaluate results

Guidelines

- Code + PDF (ideally LaTeX)
- Discussion encouraged, but **all submissions must be individual**
  - *Absolutely no sharing code/work* 😡
- Typically due Thursdays @ 6PM
  - Late (50% off): 24 hours
- Blackboard submission: single ZIP

Exams (40%)

- Logically grouped, *mostly* independent
  - Use, Design, Speed/Internals
- Demonstrate basic understanding of concepts, apply to small problems

Basic structure

- Review
- Exam
- Exam debrief

Group Project (20%)

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 via YouTube, peer evaluation

More details/deadlines to come

- Probably: random groups, base project option + proposal process to deviate