Emma	Noel	Eric	Caroline
Jacob	Tianzhi	Hamilton	Gebre
Steph	Abraham	Graham	Jack
			Michael
Walter	Jacqueline	Bryan	
Brendan	Zachary	Toby	
Scott	Lillie	Zale	

Quantum Computing

CS 333

Learning Goals (for today):

- Familiarize yourself with course basics
- Be able to describe learning
- Understand motivation for technology and group policies
- Qualitative understanding of quantum measurement

Learning Goals (for this Class):

- Apply mathematical tools to describe, analyze, and solve problems related to quantum information and computation protocols.
- Build intuition about what properties of quantum mechanics lead to advantages over standard computation.
- Appreciate the limits of quantum computation.

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- Apply mathematical tools to describe, analyze, and solve problems related to quantum information and computation protocols.
- Build intuition about what properties of quantum mechanics lead to advantages over standard computation.
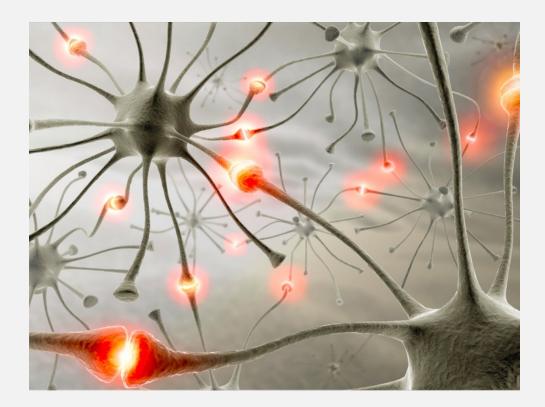- Appreciate the limits of quantum computation.

Outline…

About Me

- Shelby Kimmel
  - What to call? Professor Kimmel, Professor
  - Pronouns? she/her pronouns
  - Outside interest? Samulnori (Korean contemporary folk percussion)

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Learning from biological perspective

- Learning is the process of developing new connections between neurons in your brain.

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- Learning is the process of developing new connections between neurons in your brain.

- New connections are created by repeatedly practicing new behavior. By practicing any task, can rewire your brain to become "smart" at that skill.

Learning from growth mindset perspective

Fixed Mindset	Growth Mindset

Learning from growth mindset perspective

Fixed Mindset	Growth Mindset
Task A is easy because I'm smart.	This is easy because my brain already has necessary connections.
Task B hard because I'm not good at this type of thing.	This is hard because I need to create connections in my brain that weren't there before.

Self-test

	Fixed Mindset Reaction	Growth Mindset Reaction
Challenges	Avoid	Embrace
Effort	Problem	Progress
Criticism	Personal	Helpful
Failure	Evidence of inability	Temporary
Success of others	Threatening	Inspiring

Learning Take-aways

- Give yourself time

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- Learning is Uncomfortable (at first)

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- Learning is Uncomfortable (at first)

- Practice the skills you need

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Computers or devices in class generally negatively affect learning

- [Studies](#) show students who write notes on paper learn more than those who type
- [Studies](#) show students who use laptops/phones spend up to 1/3 of their time "zoning out" (using Instagram, checking e-mail, etc) and consequently have lower exam scores
- [Studies](#) show if you use a laptop, your classmate's exam scores will be lower.

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For some students, devices are a critical tool for learning

Policy: Use technology judiciously. Avoid unless you have a good reason for it.

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Group Problem Solving

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- Working in a group improves learning
- I don't care whether you get to the solution
- I care about whether groups are functioning in a way that helps you to learn

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Group Problem Solving

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- I don't care whether you get to the solution
- I care about whether groups are functioning in a way that helps you to learn

What behavior should I look for in a group that is maximizing learning?

- Active listening: rephrase what a group mate said
- Ask questions if you don't understand
- Be skeptical of what others say – suggest alternate approaches.
- Encourage participation
- Make sure everyone in the group understands a point before moving forward

Website tour!

[go/CS333](go/CS333)