Intro to Computer Science Research
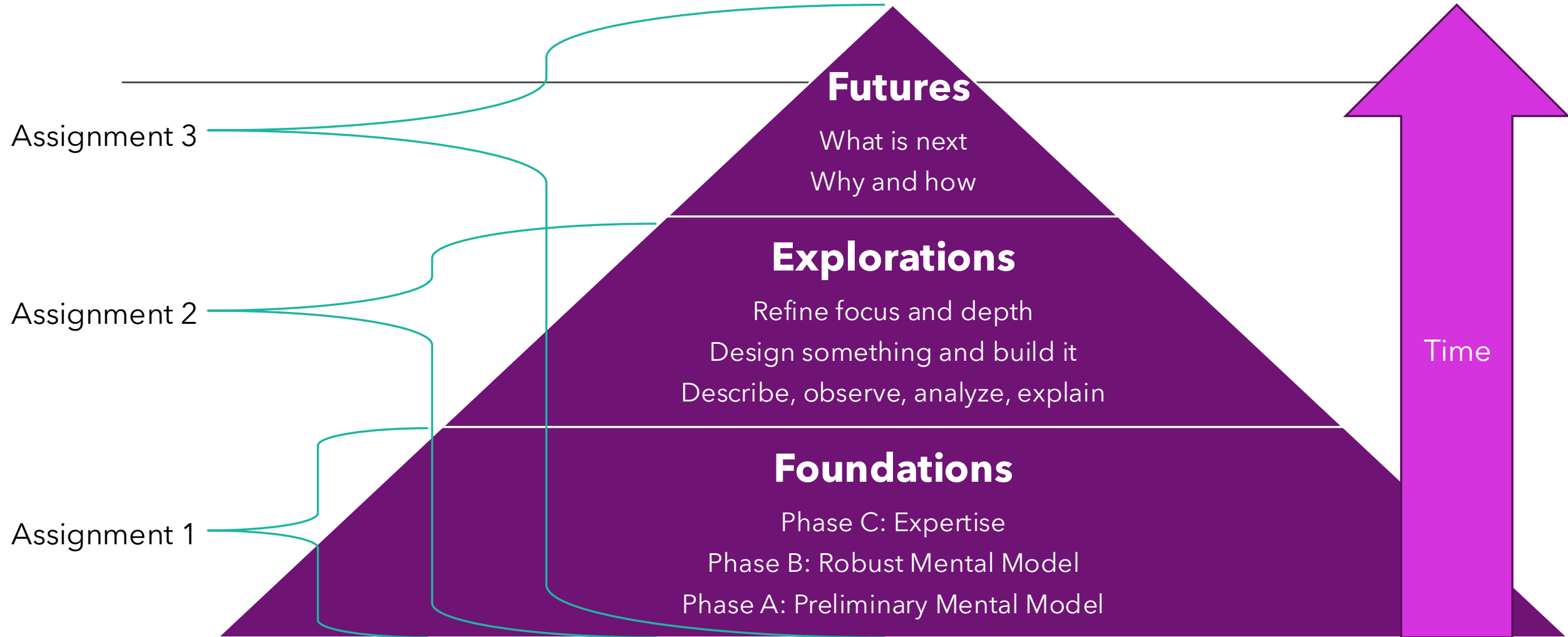
MICHAEL A. HEROUX

Tactical Goals

Complete a State-of-the-Field Project

- At the end of the course: Paper, presentation, demo, and dialogue on a topic:
  - Foundations
  - Explorations
  - Futures

Learn approaches for technical topic

- Finding content
- Collaborating
- Discussing
- Writing
- Presenting

State of the Field Components

Assignment 3

Assignment 2

Assignment 1

Futures
What is next
Why and how

Explorations
Refine focus and depth
Design something and build it
Describe, observe, analyze, explain

Foundations
Phase C: Expertise
Phase B: Robust Mental Model
Phase A: Preliminary Mental Model

Time

Strategic Goals

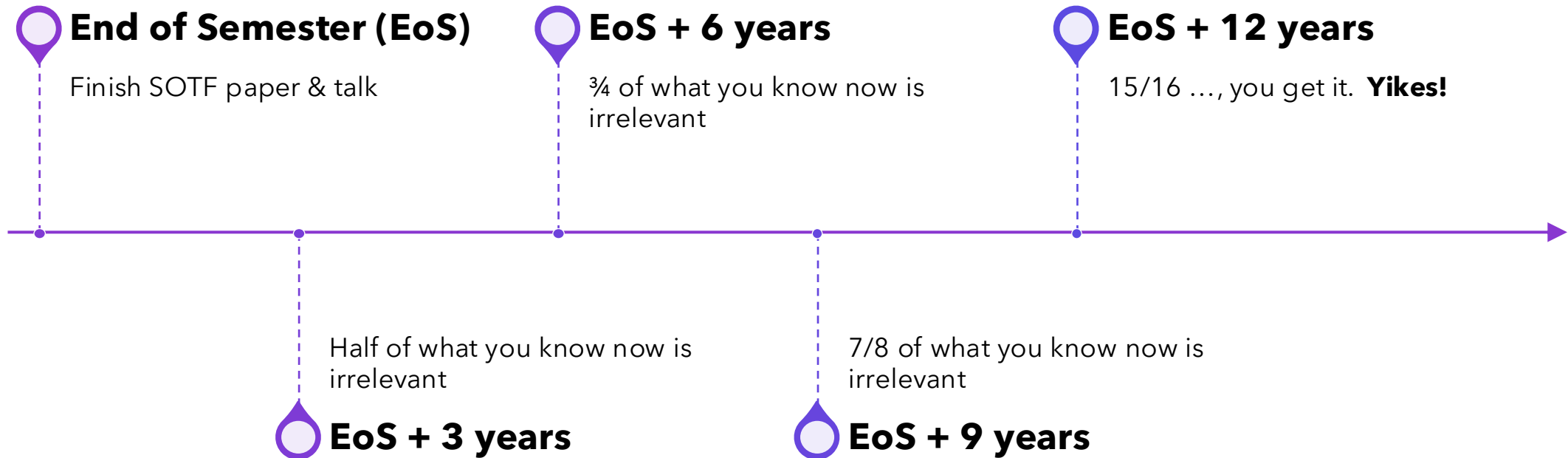## Prepare for professional computing life

- Sustained learning skills and habits
- Presence in the virtual world
- Collaborative approach to life
- **I am ready for change**

Cultivate a growth mindset

- Execute today's ideas & invest in new ideas
- Do today's job & prepare for next one
- Collaborate today with colleagues & increase your existing network
- **I am a learner**
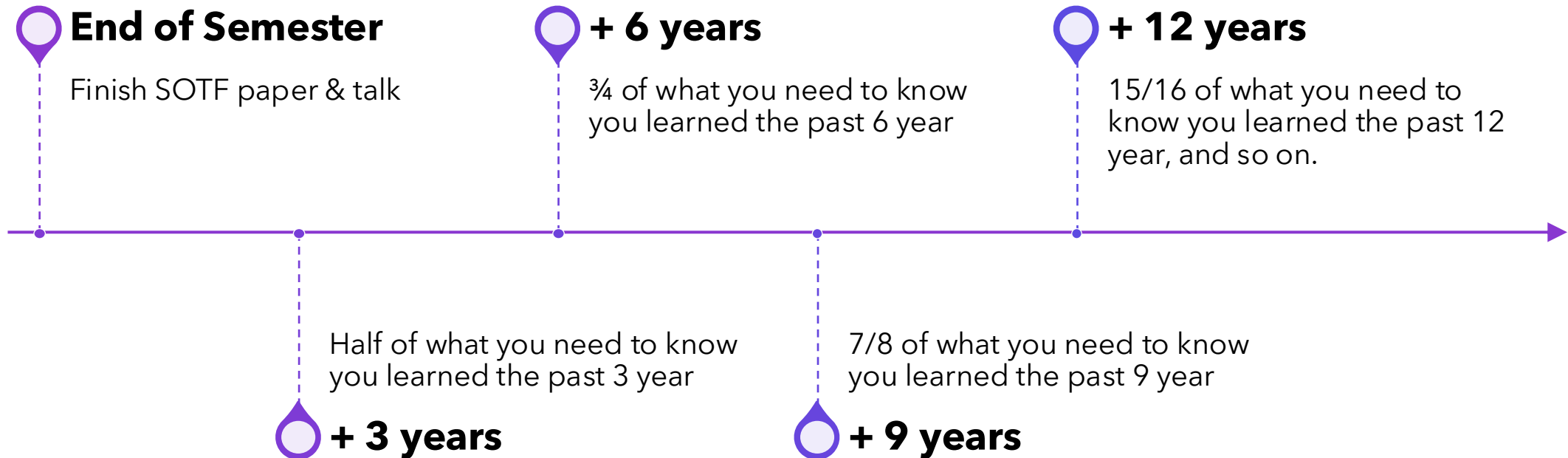
Timeline: CS Knowledge "half life"

End of Semester (EoS)

Finish SOTF paper & talk

EoS + 6 years

¾ of what you know now is irrelevant

EoS + 12 years

15/16 …, you get it. **Yikes!**

Half of what you know now is irrelevant

EoS + 3 years

7/8 of what you know now is irrelevant

EoS + 9 years

Without regular learning of new content, our skills diminish!
Rate of progress seems to be accelerating: 3 years -> 2, 1.5?

Timeline: CS Knowledge Growth
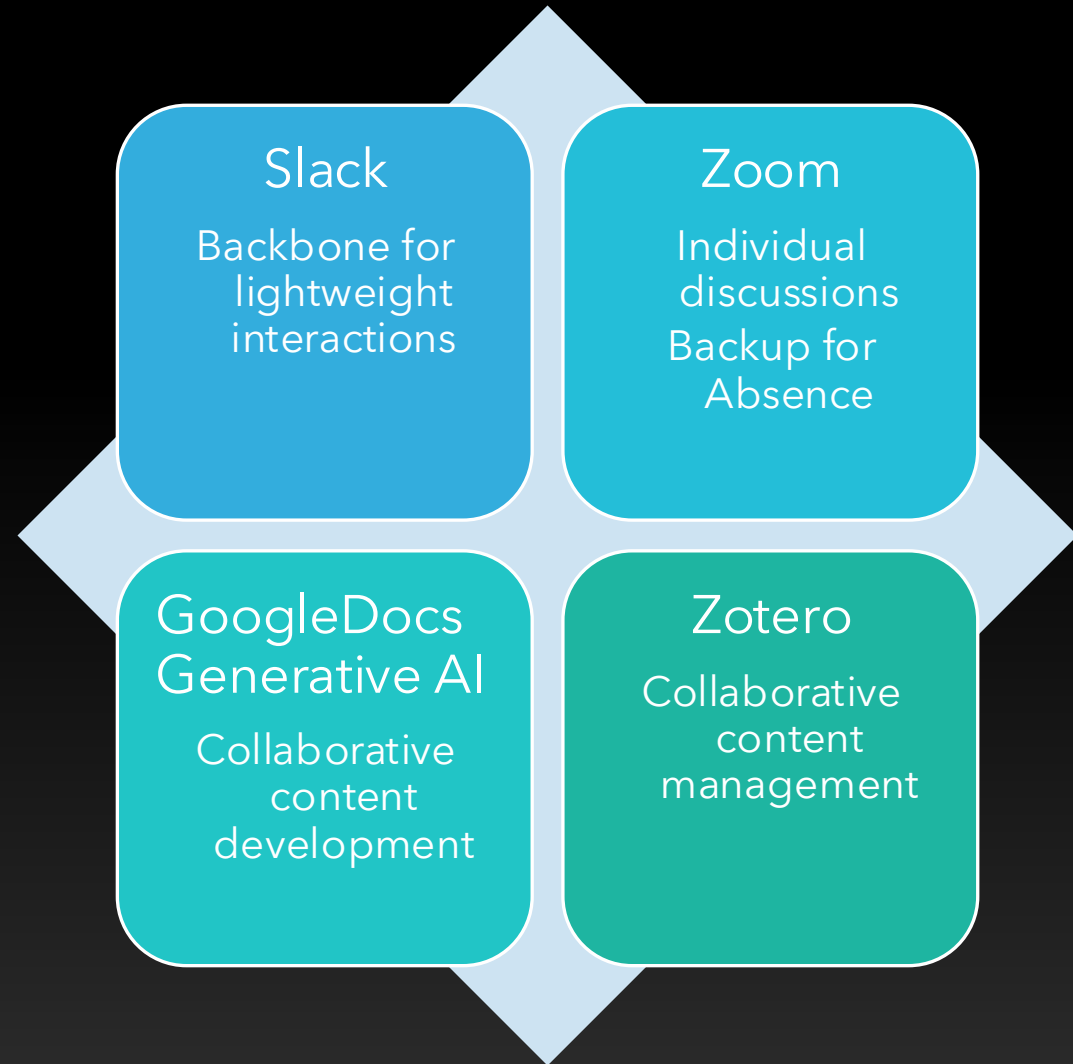
End of Semester

Finish SOTF paper & talk

+ 6 years

¾ of what you need to know you learned the past 6 year

+ 12 years

15/16 of what you need to know you learned the past 12 year, and so on.

Half of what you need to know you learned the past 3 year

+ 3 years

7/8 of what you need to know you learned the past 9 year

+ 9 years

Slack: Creating persistent presence

Enables a virtual team room experience

Have it on your phone, desktop, tablet, Apple Watch

Monitor it regularly

Generative AI Tools

Exciting new frontier

We will embrace and explore the use of these tools!

We have a [virtual CS373 instructor](#)*

We have [Gemini Deep Research](#)

…And many emerging capabilities

* https://chat.openai.com/g/g-0m35Mzndc-cs-capstone-course-companion

Expectations

Keep strategic goals in mind
- Prepare for professional life
- Cultivate a growth mindset
- Our tactics can change

Be transparent
- Communicate to me and your classmates about opportunities, challenges
- Communicate early, when issues are just emerging and easier to address

Commit
- Stay focused
- Adapt as needed

Resources

https://maherou.github.io/Teaching