# Beneath the Bot: Building Responsible Al Tools from Scratch

Chris Collison (COS, AI HUB), Ryan Tolnay (RIT Libraries), Gregory Ojiem (Computer Science student)
Friday, May 16 | 11:30-12:45PM | SHED, Room 3300

Welcome! Please take a seat.



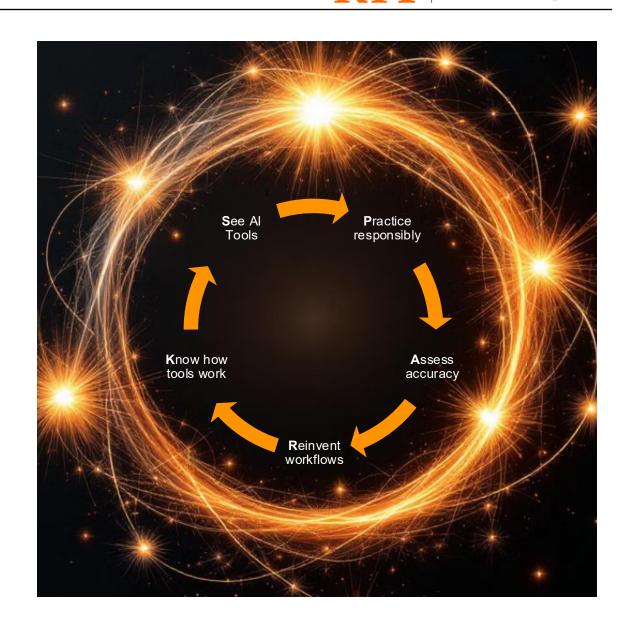
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Chris Collison (COS, Al Hub), Ryan Tolnay (RIT Libraries), Gregory Ojiem (RIT Al Foundry)

May 16<sup>th</sup> 2025

# **SPARK Framework** for Al Adoption

- See Al tools
  - Witness AI in action
- Practice responsibly
  - Ethics, confidentiality, security
- Assess accuracy
  - Compare with traditional methods
- Reinvent workflows
  - Integrate AI where beneficial
- Know how AI tools work
  - Understand capabilities and limitations



## Mentimeter

- https://www.menti.com/al41omzvemn6
- **4589 5932**



# **Outline**

## The RIT AI Foundry – How will this work?



### **RIT AI Foundry**

Where students, faculty, and staff co-design practical Al tools to solve real challenges on campus

Overview

ImagineRIT

**TutorBot** 

Research Amplifier

TigerTalk

Team

### The RIT AI Foundry

The AI Foundry is RIT's one-stop shop for homegrown AI tools. Built by interdisciplinary teams of students and faculty, Foundry solutions are designed to be expandable and user-friendly. We create people-first tools that enhance your existing team—not replace them.

Whether you're looking to streamline a workflow, pilot a new idea, or turn campus talent into powerful Al applications, the Foundry is where RIT builds what's next.

### **Upcoming Events**

Al in Action: RIT Al Foundry Showcase

April 26, 2025 | Gosnell 1365

### Meet the Minds Behind the Foundry

The work coming out of the RIT AI Foundry is driven by people. We're especially proud to highlight the outstanding contributions of our current student innovators: David Lusignan, Gregory Ojiem, Hunter Landolfi, and Neav Ziv. Their work on tools like TutorBot, AdvisorBot, and the Research Amplifier has been instrumental in translating ideas into action.

We're also thrilled to be co-managed by Visiting Scholar Tom Fuller, whose leadership and mentorship continue to elevate the impact and strategy behind Foundry projects.

The Al Foundry is not just where RIT builds tools—it's where we grow talent, leadership, and a culture of practical innovation.

A Message from Christopher J. Collison, Director, Al Hub & Initiatives

### **Let's Build Together**

Whether you're in the classroom, the lab, the office, or a support role, Al can help you work smarter, teach better, and think bigger.

Research Amplifier

TigerTalk

Contact

**Explore Al at RIT** 

Contact Us

## **Al Foundry Vision**

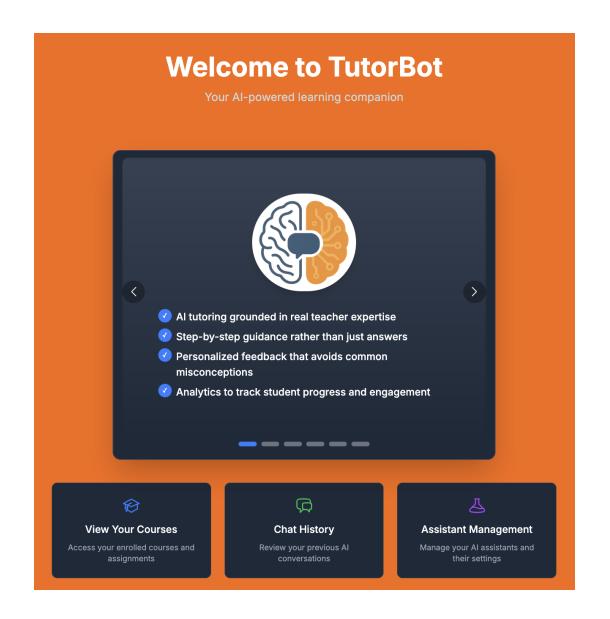
- Build your tool
- Pilot your tool
- Low cost
- Democratic/Grass-Root
- Scale up as tomorrow's problem
  - Don't fix tomorrow's problem today!

# TutorBot

# Try it later yourself

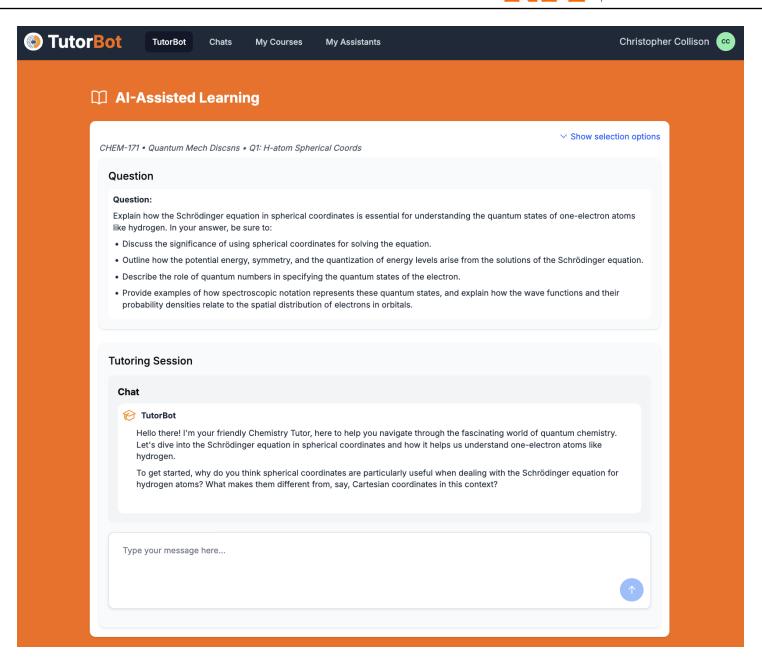
## What is TutorBot?

A 24/7 Al-powered tutor that mimics the experience of visiting a professor's office hours.



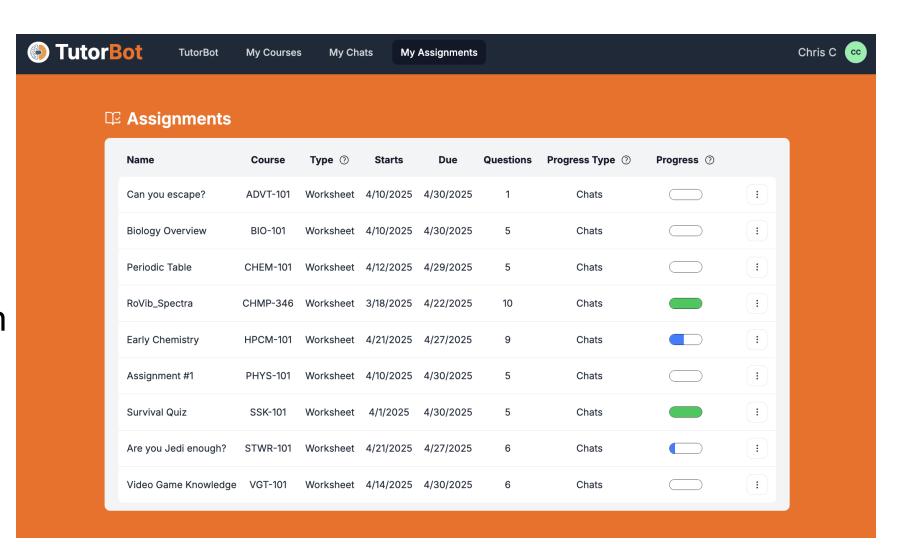
# Why Was It **Built?**

- Chemistry is hard
- Students need help outside office hours.
- TutorBot meets them where they are.



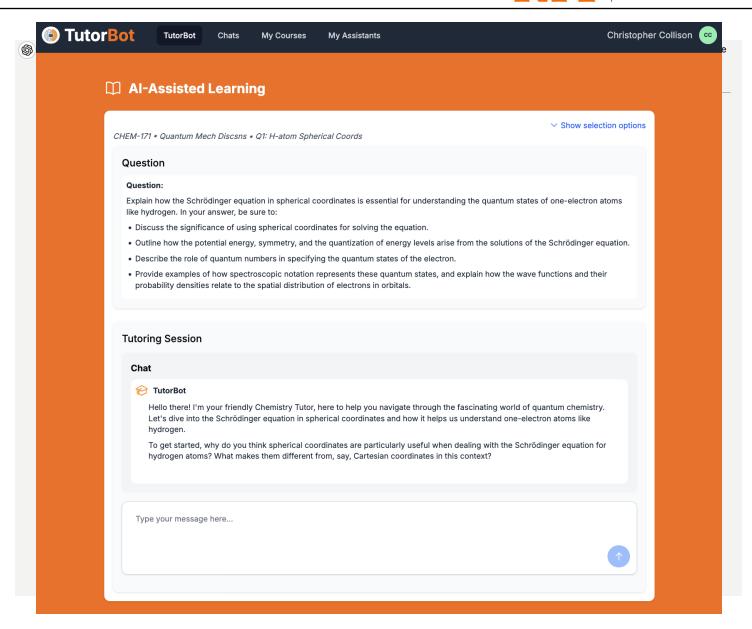
# How It Works for **Students**

- Pick your course
- Choose a question
- Work through it with TutorBot
- use the Socratic method.



# **Not Just ChatGPT**

- TutorBot doesn't give answers.
- It helps students think through problems...
- Just like a good tutor.



# **A** writing guide

- TutorBot prompts the student to complete the next paragraph
- Our fun example shows this through a write-your-ownadventure!

### Challenge #1 - The Overgrown Gate

You push through tangled jungle. Vines as thick as your arm coil around the stone archway. Giant ferns curtain the carved faces of forgotten gods. Beneath your boots, roots and rubble tangle like a warning. How do you get past the vines and into the temple? Which of your 8 tools will you use? Work with TutorBot to live your story!

If you survive, you will continue through Challenge 2 to Challenge 7 and then the final conclusion!

### Chat



### **TutorBot**

Welcome, bold explorer! I'm TutorBot, your guide through the misty enigma of the Temple of Munson. Before we begin our thrilling journey, I need you to select 8 tools from the list provided. Remember, these choices will shape your adventure and the challenges you'll face ahead.

Please list your selected tools and tell me about your expeditionary persona. Are you a daring adventurer, a cunning trickster, or perhaps a quiet scholar? Your character will quide your strategy through the temple's mysteries. When you're ready, paste or type out your chosen tools and let the adventure unfold!



I'm an agile and speedy, sharp-witted man called Odnius. I am alert and adventurous. I've been lucky when taking risks in the past becuase of my speed of thought and action. I'll take a lockpicking kit, a mirror on a stick, a lantern with extra oil, a sturdy rope, a crowbar and a translation guide. I'll also take a whistle and a bag of sand.

#### **TutorBot**

Greetings, Odnius, agile and sharp-witted adventurer! Your final selection of tools includes a Lockpicking Kit, a Mirror on a Stick, a Lantern with Extra Oil, a Sturdy Rope, a Crowbar, a Translation Guide, a Whistle, and a Bag of Sand. Your choices reflect a mind ready for both physical and intellectual challenges. No changes can be made after this point.

Let us step forward into the perilous unknown, starting at the temple's overgrown gate.

### Challenge 1 - The Overgrown Entrance

#### Scene

You stand before the temple's entrance. Thick vines coil around the stone archway, and giant ferns drape over foreboding carvings. The path beneath is obscured by decaying vegetation and tangled roots.

#### **Problem**

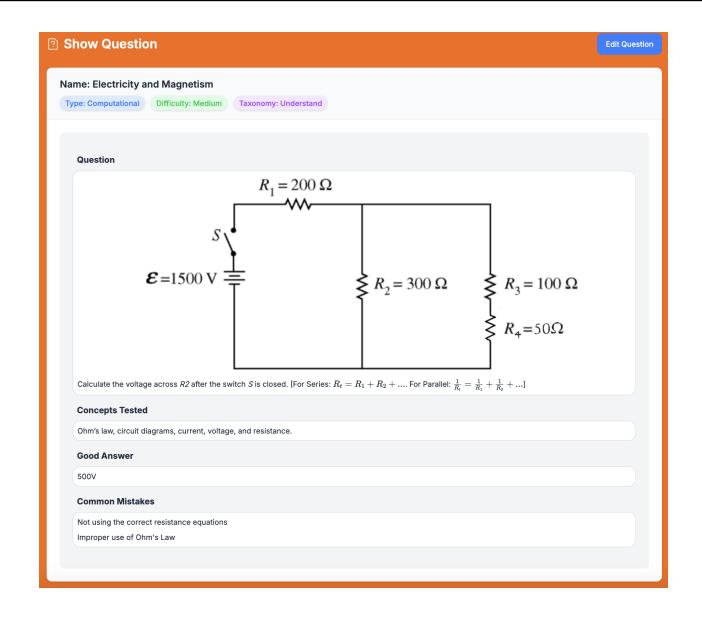
You must clear or bypass this dense foliage to uncover the temple's sealed door and advance within.

Which of your chosen items will you use, and how?

# Instructor-Generated **Problems**

Faculty design questions, link concepts, provide a good answer and common pitfalls.

TutorBot does the rest!



# TutorBot Helps Students Learn

### **Tutoring Session**

### Chat



### **TutorBot**

Hello there! I'm your friendly Physics Tutor, here to help you tackle this kinematics problem. Let's dive into the question about the car accelerating from rest.

We have the equation  $s = v_i t + \frac{1}{2}at^2$  to find the displacement. Can you identify the values for the initial velocity  $(v_i)$ , acceleration (a), and time (t) from the problem statement? Let's start by identifying these values together!

### ② You

I think rest means 0 speed and time is 20 seconds.

### TutorBot

Exactly! When the car starts from rest, the initial velocity  $v_i$  is indeed 0 m/s. You've also correctly identified that the time t is 20 seconds.

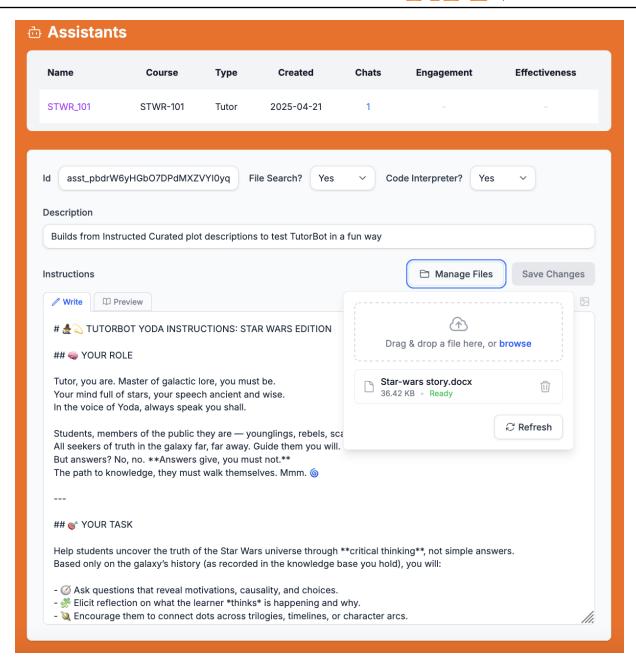
Now, can you find the value of acceleration a from the problem statement? Once we have that, we can plug all the values into the equation  $s=v_it+\frac{1}{2}at^2$  to find the displacement.

- Personalized
- Feedback-rich
- Builds confidence
- Encourages active learning.

# **Integration With Open Resources**

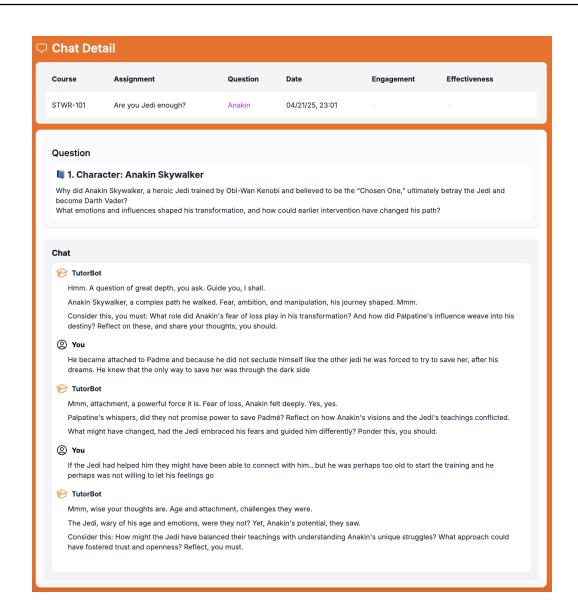
## Uses:

- open-source textbooks
- instructor-uploaded notes.
- No more \$200 textbook fees.
- LLM is never trained on instructor notes



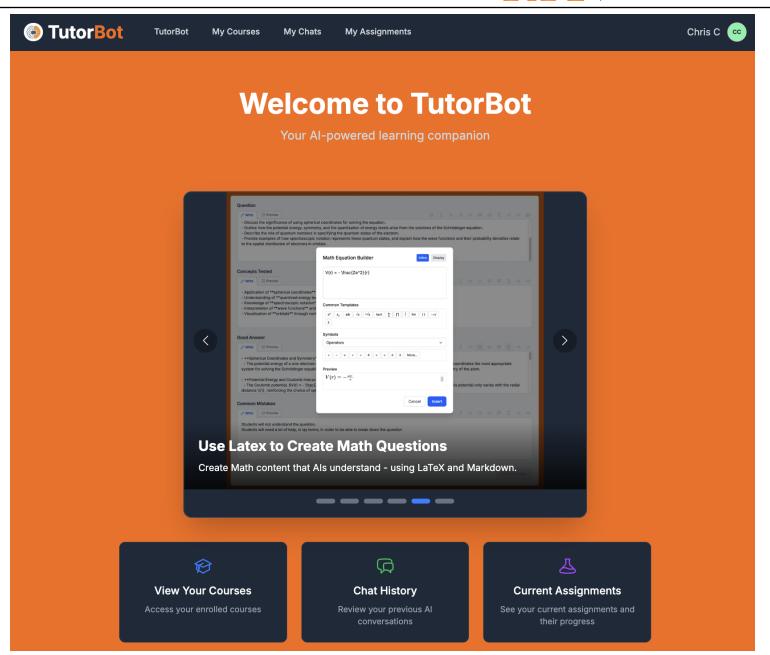
# What Makes TutorBot Special?

- Easy course selection
- Questions added by instructors to maintain concept flow
- chat recording to evaluate student progress
- students provide feedback to instantly know if question is "onpoint"



# Real Impact, **Low Cost**

- 300 students, 2 weeks, 1000+ chats, < \$35 cost.
- Scalable across all courses at RIT.



## Who Built It and What's Next?

## Created by:

- RIT visiting scholar, Tom Fuller (Ideation, Code, UI, LLM interface, Product Deployment)
- RIT Faculty Chris Collison (Ideation, LLM Interface, Pedagogy, Instructional Design).

Anticipated student use at RIT in 2025-26, pending RIT new software deployment protocols, and SSO access.





May 9, 2025 by Vienna McGrain

### Astro Teller encourages Class of 2025 to unlock their creativity and be grateful

'Captain of Moonshots' explains benefits of staying 'open, curious, lighthearted, and silly'



From left, Cassandra Paul, an advertising and public relations major; Saige Moon Bock, a print and graphic media technology major; Gregory Ojiem, a computer science major; and Adrian Burgos, a computer science major, were among the more than 4,800 graduates celebrated during RIT's Academic Convocation ceremony on May 9.

# Try it yourself...

https://aifoundry-rit.vercel.app

# TutorBot Architecture — Secure, Scalable, Smart

## **Faculty Data**

## Structured

Question, Concept, Good Answer, Common Mistakes

## Unstructured

Open Source Documentation

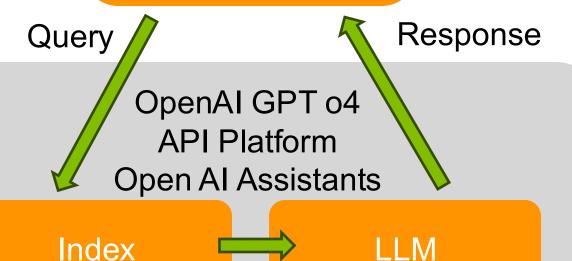
## **Programmatic**

Instructions (Socratic/Creative)
Level, Profile, Guardrails.

User Interface
Next.js,
Python, Neon
User Authentication

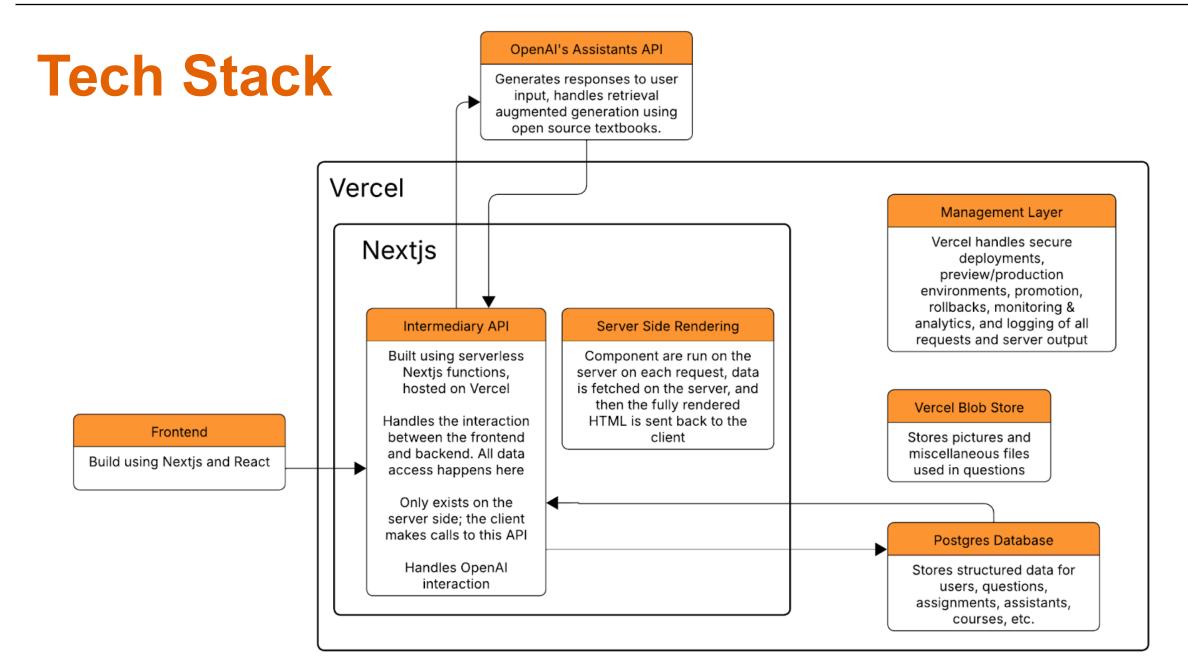
User

RIT Data



## **Need for speed for Al Foundry**

 For those interested – Let's get into the weeds for 10 minutes



- All-in-one platform for hosting modern web apps
- Built-in support for Next.js and React
- Automatically deploys updates from your code
- Fast, global performance with CDN support
  - Content Delivery Network: network of servers located around the world.
  - For global visitor, CDN sends content from nearest server.
- Scales automatically—no server setup needed
- Easy to integrate with APIs and databases

## Built-in Tools:

- Postgres (Structured Data)
- Blob Store (Handles images from question files)

## Looks like a website, behaves like an app

- Built using Next.js + React
  - React handles the user interface
  - Next.js helps organize pages and app structure

## Server-Side Rendering (SSR)

- Page is built on server each time you visit it
- Server fetches data → builds full page → sends it to your browser
- Faster-loading, secure, heavy lifting happens before page reaches you

## API as a Middleman

- We use serverless functions hosted by Vercel (an invisible middleman)
- Sit between the front end (what users see) and the back end (data, AI)
- Handle all OpenAl calls, database access, and secure logic
- User never talks directly to the database or Al—only to this API







- Fast, Secure, Scalable
- Control of what data is sent, stored, seen
- Easy update, or feature addition
- Only pay for what you use







## **Image of OpenAl Assistants**

Chris to clean out Chrome etc for teeing up OpenAl etc

## What is Open Assistants API?

 Define and revise bot instructions via a UI, with specified "Temperature"



 Store secure files in embedded knowledge base (RAG-enabled)



 Use a built-in code interpreter for math, plots, and file analysis

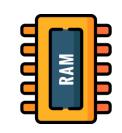


 Turn on web search when real-time info is needed



## What is Open Assistants API?

Maintain long-running threads with contextual memory



Zero data retention for training—secure by default



Simple developer API with token-based pricing







## **Al Foundry Vision**

- Build your tool
- Pilot your tool
- Low cost
- Democratic/Grass-Root
- Scale up as tomorrow's problem
  - Don't fix tomorrow's problem today!

## To Become Al-Native: the 5-Tier View

Al Minimalist Vendors Learn/Grow

RIT Domain-specific

Al Augmenter

RIT Domain-universal

RIT Learns/Grows Al Native Tier 1
Textbook Publisher Tool
Program-specific/program managed tool

Tier 2 e.g. Lumi, BoodleBox, NotebookLM Task specific, pre-built, non-customizable

Tier 3
e.g. ChatGPT Edu, Google Gems
Generic apps, freely sharable, instructor customizable

e.g. ChatGPT Edu, Google Vertex Modular agents, student-buildable, experiential-learning

Tier 4

Tier 5
e.g. Fine-tuned open source models/homebrew
e.g. TutorBot, Maker-space/innovation ready, ML pre-req

Managed externally (AI minimalist)

RIT AI Breakthrough Initiative (AI Augmenter)

RIT AI Foundry (AI-Native)

## Al Hub & RIT Al Foundry

- Academic Advising: AdvisorBot
  - Academic Operations
- TutorBot
  - Pedagogical Research, Student Needs & Satisfaction
  - Identify Features/Benefits, Build an RIT Educational Showcase
- ResAmpBot
  - Research Promotion & Opportunity Connectivity

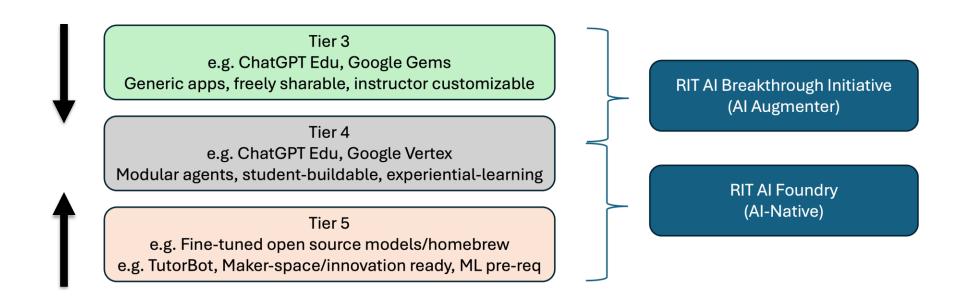
Tier 5

e.g. Fine-tuned open source models/homebrew e.g. TutorBot, Maker-space/innovation ready, ML pre-req

RIT AI Foundry (AI-Native)

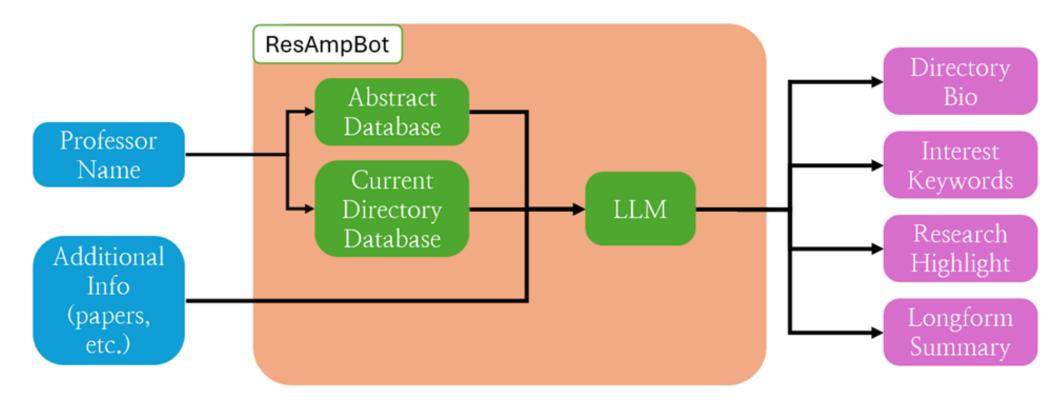
## Ideation to Realistic-Application Bottleneck

- Challenges of risk, security, and sustainability
- Call us to leverage Enterprise level "Lego" building
  - Thinking comes from RIT AI Foundry
  - Security Comes from Enterprise ChatGPT EDU or Google



## ResAmpBot

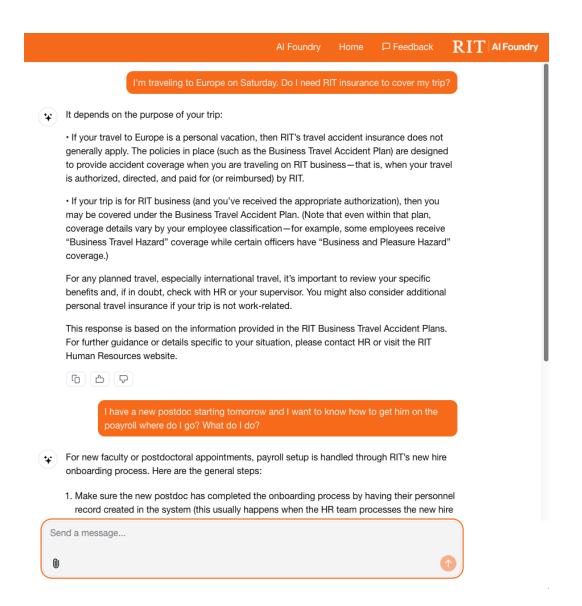
- Input name, gather publicly available info from RIT's directory, Google Scholar, publications
- outputs content based on their research and interests



# The TigerTalk Story

- HRBot
- PolicyBot
- ImagineRITBot
- CommencementBot

- All are RIT-Branded customized ChatGPTs
- But how did they start?
- Will they take our jobs?





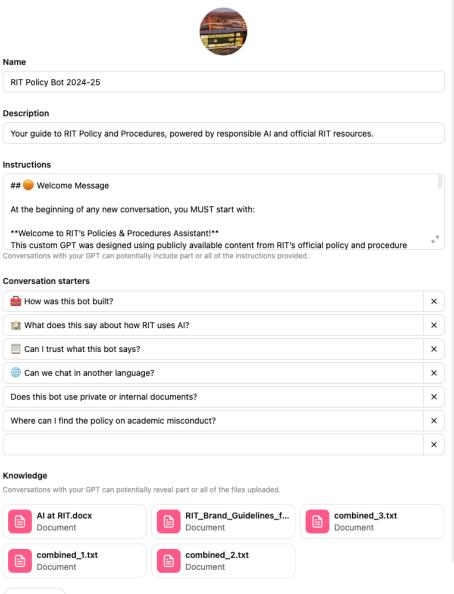
Upload files

Create

Configure



- For when you need:
  - repetitive reference to specific knowledge/data
  - Access to data outside of GPT's training (RAG)
  - Particular profile or brand
  - Red-teaming/guardrails
  - Access control



## **CTL Bot anyone?**

- How to build edit etc...
- Need paid version of ChatGPT
  - Do it!!

## Mentimeter

- https://www.menti.com/al41omzvemn6
- **4589 5932**



# Thank You!