

# C-LASS: Cybersecurity Learning with AI for Static Systems

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Team: Sean Golez, William Barnett, Kayden Vicenti, Colton Leighton

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CS Faculty Mentor: Scott LaRocca

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# Our Client

Lan Zhang Assistant Professor



## Needs and motivations

Teaches software engineering courses and sought out for a tool to help students in understanding static analysis CTF challenges.

## Static Analysis Capture-The-Flag (CTF) Challenges

- Involves examining programs and files without executing them to find hidden flags
- Plays a central role in identifying security vulnerabilities in code
- Difficult for students to complete

```
xferinfo_cb:  
 0 @ 00021210 void* lr = *(arg1 + 8)  
 1 @ 00021218 int32_t r4  
 2 @ 00021218 int32_t r5  
 3 @ 00021218 r5:r4 = arg5  
 4 @ 0002121c *(arg1 + 0x208) = arg4:arg3  
 5 @ 00021220 int32_t r2  
 6 @ 00021220 int32_t r3  
 7 @ 00021220 r3:r2 = arg7  
 8 @ 00021224 *(arg1 + 0x210) = r5:r4  
 9 @ 00021228 uint32_t r12_1 = zx.d(*(lr + 0x1ae))  
10 @ 0002122c int32_t r4_1  
11 @ 0002122c int32_t r5_1  
12 @ 0002122c r5_1:r4_1 = arg6  
13 @ 00021230 *(arg1 + 0x220) = r3:r2  
14 @ 00021238 *(arg1 + 0x218) = r5_1:r4_1  
15 @ 0002123c if (r12_1 != 0)  
16 @ 00021244 int32_t r0 = *(arg1 + 0xc)  
17 @ 00021248 *(lr + 0x1ae) = 0  
18 @ 0002124c curl_easy_pause(r0, 0)  
19 @ 00021254 return 0
```

# Why Current LLMs Struggle as Tutors

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## Problem 1

Lack of AI models that provide correct and precise explanations.

## Problem 2

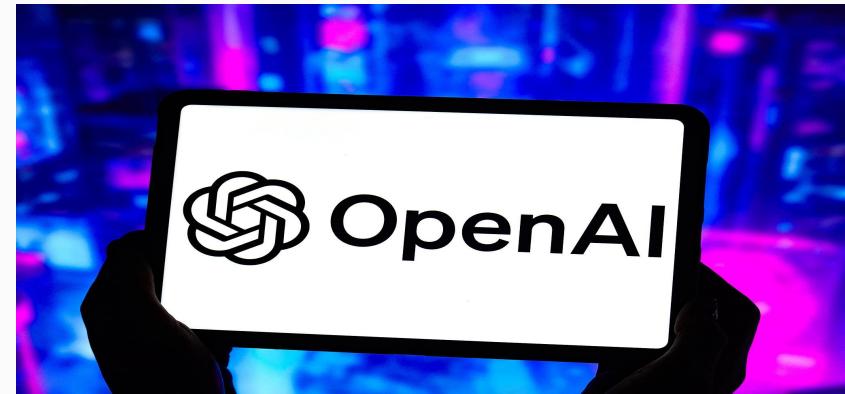
Sparse coverage of static analysis concepts in general-purpose models

## Problem 3

Limited support for inquiry-based learning

## Problem 4

No structured explanation path





# The solution

An **interactive AI tutoring agent** designed specifically to answer student questions about static analysis CTF challenges

Includes two main interfaces:

1. A chatbot for students to prompt the LLM
2. A visual editor with a knowledge graph for teachers to curate what information/documents that the LLM can utilize

Key Outcomes:

1. An accessible tutoring assistant for students.
2. Structured LLM database that teachers can tailor to class learning outcomes.



# THANK YOU

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