BURGS Weekly Presentation

Broadening Undergraduate Research Groups

10/31/2025

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Gaze XR: LLM Interpretations Overview

Completed (Summer work & Current)

01

App Policy Extractions

02

Google Gemini Response Extractions

03

Planed with Dr. JinYi Yoon for the project trajectory

In Progress

04

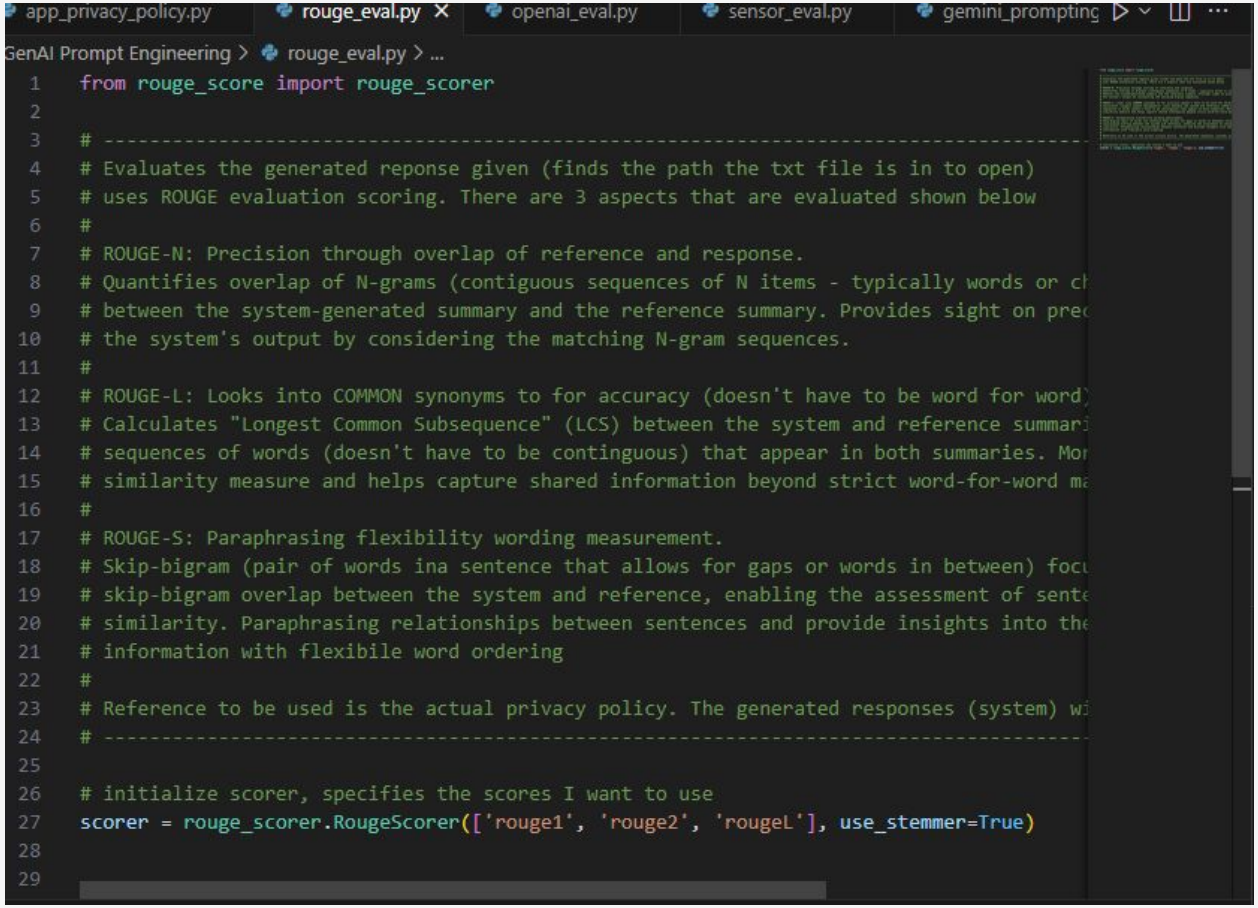
ROUGE Evaluation programming & sensor sorting algorithm

05

Research in other evaluations for LLM and how they work

06

Expand beyond Google Gemini to paid services (ChatGPT, ClaudeAI, etc.)


app_privacy_policy.py
rouge_eval.py
openai_eval.py
sensor_eval.py
gemini_prompting
GenAI Prompt Engineering > rouge_eval.py > ...
1 from rouge_score import rouge_scorer
2
3 # ----------
4 # Evaluates the generated reponse given (finds the path the txt file is in to open)
5 # uses ROUGE evaluation scoring. There are 3 aspects that are evaluated shown below
6 #
7 # ROUGE-N: Precision through overlap of reference and response.
8 # Quantifies overlap of N-grams (contiguous sequences of N items - typically words or ch
9 # between the system-generated summary and the reference summary. Provides sight on prec
10 # the system's output by considering the matching N-gram sequences.
11 #
12 # ROUGE-L: Looks into COMMON synonyms to for accuracy (doesn't have to be word for word)
13 # Calculates "Longest Common Subsequence" (LCS) between the system and reference summari
14 # sequences of words (doesn't have to be continguous) that appear in both summaries. Mor
15 # similarity measure and helps capture shared information beyond strict word-for-word ma
16 #
17 # ROUGE-S: Paraphrasing flexibility wording measurement.
18 # Skip-bigram (pair of words ina sentence that allows for gaps or words in between) focu
19 # skip-bigram overlap between the system and reference, enabling the assessment of sente
20 # similarity. Paraphrasing relationships between sentences and provide insights into the
21 # information with flexibile word ordering
22 #
23 # Reference to be used is the actual privacy policy. The generated responses (system) wi
24 # ----------
25
26 # initialize scorer, specifies the scores I want to use
27 scorer = rouge_scorer.RougeScorer(['rouge1', 'rouge2', 'rougeL'], use_stemmer=True)
28
29

LLM Interpretation & Evaluation

- Prompt Engineering
  - Prompt engineering guide (google)
  - Prompt engineering guide (AI source?)
- Rouge
  - Rouge_score_api
  - Calculate rouge score in python
  - Text summarization with transformers in python
  - Rouge Score Tutorial (From Medium)
  - Rouge score how to calculate
- BLEU
  - BLEU score evaluation class
  - BLEU score in python tutorial
- GPT Evaluation
  - Open AI evals

Gaze XR: Consent Prompt Bypassing Overview

We're Here ↠

Timeline

01 Met with Paul
- Data inference
- Apply their project to ours

02 Manifest Files for checking out developer ignorance for eye tracking

03 Learn more about Paul's project, help them in any way, see if their project works without the prompt on our end

Gaze XR: Manifest Evaluations(Kim)

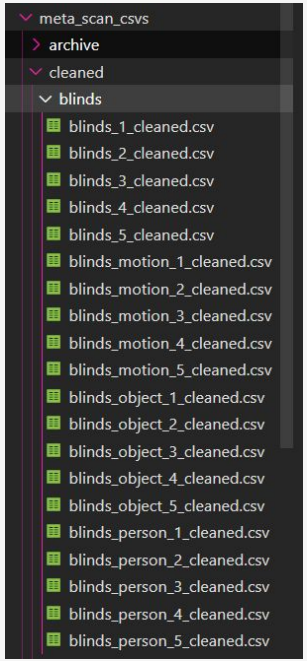
Plan

- Work with Paul and complete tasks as needed/directed
- Talked over Pauls work and determined we *should* be able to use the side channel attack with our original plan
- Need to confirm that the only thing that dictates the eye tracking tag is the declaration in the Android Manifests
- Work with Allie and Gaytri as they need extra hands

In Progress

- Created a Git Repo to contain the manifest evaluations
- Working on getting access to the manifests using the headset and desktop
- Compiling findings into a spreadsheet for easy comparison
    - manifest evaluations

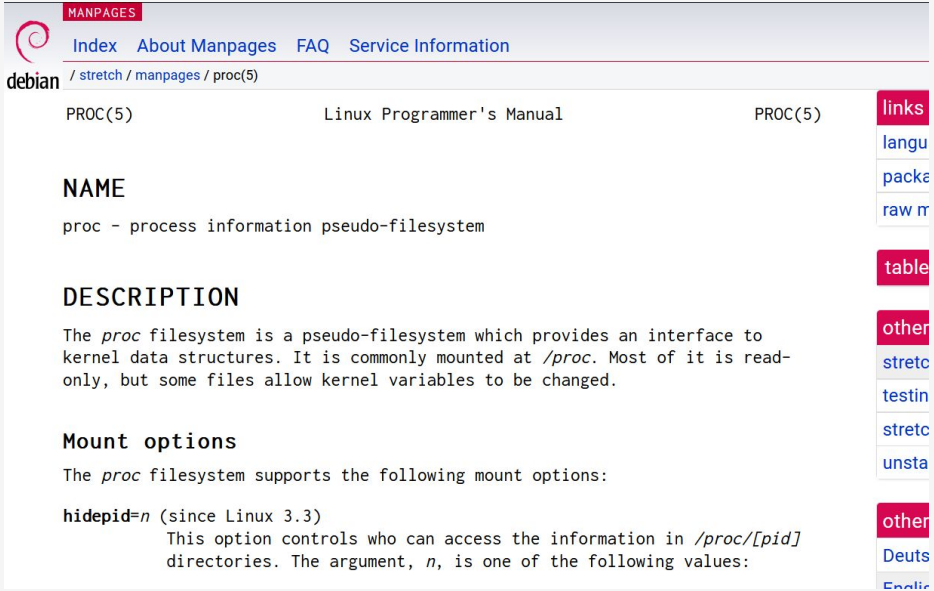
Spatial Seer - Perfetto Data Scans



- We managed to collect 110+ scans and converted them to CSVs
  - 5 Room Types
    - Meeting room (blinds up)
    - Meeting room (blinds down)
    - Kitchen
    - Hallway
    - Lab room
  - 20+ Trials
    - 5 Basic scans
    - 5 Object Alteration
    - 5 White Noise (Person walking around scan)
    - 5 Motion (VR Headset User walking/looking around)
- MQ3 auto updated and it changed the way the headset scans, messed with the data we were collecting with Perfetto
  - Able to be fixed in post-processing but requires more/different cleaning techniques
  - Currently working on integrating all 100+ trials in ROCKET and SVM Models
  - Also turned off the auto update feature to protect us from this problem in future

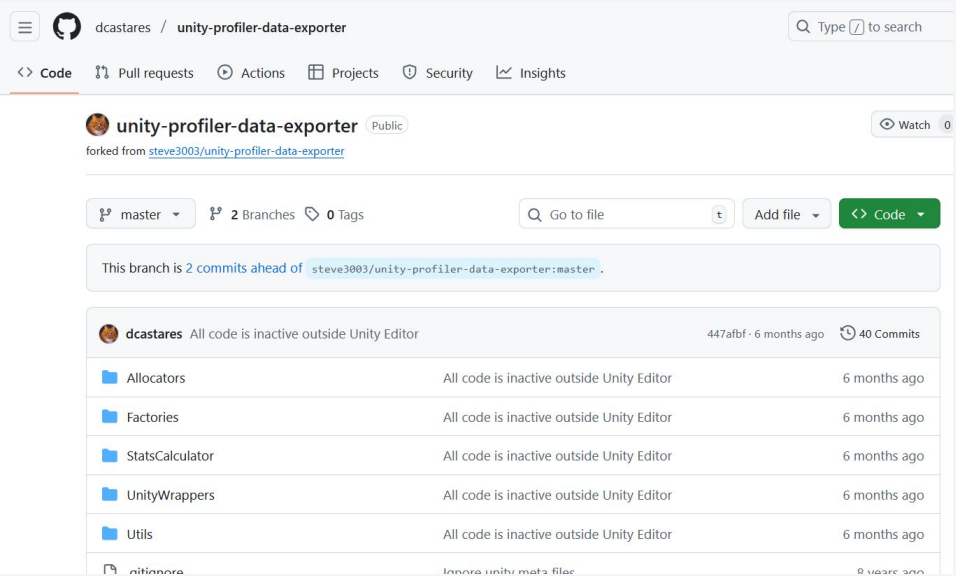
Spatial Seer - Perfetto Data Scans

- The performance indicators that matter the most:
  - app_rss_mb → Virtual memory size in bytes
  - app _vss_mb → “Resident Set Size”, AKA the number of pages the process has in real memory
  - app_uss_mb → “Unique Set Size”, measures the amount of memory used exclusively by the process without considering shared memory



Spatial Seer - Unity Data Scans

- Trying to get the Unity Profiler Analyzer to work on our Unity scanning applications to reaffirm attacker's access to sensitive data
  - Hope to replicate work with Perfetto
  - However, no current way to export the data locally with Unity (as my research indicates)
- Found this script that supposedly can export the .data files and convert them into CSVs
- Integrating with both AR + MR Unity Applications for MQ3
- Gayatri and I are working on MR Unity Application next week



Spatial Seer - Next Steps

1. Finish the ML Model for MQ3's AR Application (100+ scans)
2. Create MR Application for MQ3
3. Unity Profiler Analyzer trials for both AR + MR applications
    a. We hope to get around ~20 trials for each of these
4. VTURCS
5. Workshop Paper

Questions

1.