

Can GenAI help ADC?

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Introduction

- Yesterday, we heard from experts about recent operational issues
- Today, we heard about the need and plans for automation
- Alas, there are now fewer and fewer ADC experts to help with these issues
- Maybe we can get help from genAI – if experts can teach them?
- This is not a new idea, but not a lot of progress in the past 2-3 years
 - Maybe we will hear about some progress in the next few talks – AskPanDA, AlforAF
- In this talk – discuss some ideas for a few ~6-month long projects

Monitoring

- Monitoring is highly fragmented
 - Few experts know where to find relevant information
 - Different systems provide different slices of information
- Every few years we try to rebuild monitoring from scratch
- Is it time to get help from genAI?
 - Don't build new systems or new monitoring pages or new bookmarks
 - Train genAI to find the information that is needed to debug a problem
 - Don't even need a GUI or forms or drop-down choices – ask questions with phrases
 - In principle, the conversation can be in any language
 - Instead of new features, maybe better to focus on a new “intelligent” system
- This is not difficult to implement with modern AI

Example of a new monitoring system based on AI

- Expert: can you show me error rate for last hour compared with 24 hours ago
- genAI: here are the results from Grafana
- Expert: is error xxx happening at other sites
- genAI: I only see a similar pattern at one more site YYY_T1
- Expert: show network usage for last hour and 24 hours ago for both sites
- genAI: here is the data in a table obtained from ESNET
- Expert: do you see anything strange in pilot factory
- genAI: here are some pilot factory plots for the time and sites in question
- ...
- Need a volunteer to try [Gemini Fine Tuning](#)

Documentation

- We have a lot of different systems, and lots of old documentation
- Instead of doing more documentation weeks, reports etc, or looking for new platforms to replace twiki ...
- Why not use genAI to integrate the existing documentation?
 - As you heard from Mario's talk, a lot of progress was made last year on documentation and there are future plans for new platforms
 - In parallel, how about "fine tuning" an existing LLM to provide an interface to documentation?
 - Users can simply ask questions - they get curated answers
- We will see a nice example from Paul in the next talk

Knowledge base

- We have many systems in ATLAS which provide help/support
 - For users, for sites, for physics groups, for software developers ...
 - Shifts, ticketing systems, issue tracking, emails
 - These are very useful as a knowledge base for future users, trouble-shooters, operators etc
 - But information is difficult to find – we cannot rely always on expert memory
- Let's use genAI to integrate the knowledge base into a seamless system
- Train and feed the useful parts to a pre-trained LLM

AI front-end for Databases

- ATLAS keeps a lot of information in databases
 - With many interfaces used by mostly automated query and display systems
- Why not use genAI to provide a query/user interface to this date
 - This is a challenging problem – we have large data volume (both primary data like in PanDA, Rucio; and derived data like those in monitoring systems, elasticsearch)
 - But there are many example interfaces
 - Let's start with one using genAI
 - This could turn out to be an easier way to query//display ADC data
 - Users do not need to learn query language – they use spoken words
- We will see a nice example in the last talk from Ilija

Additional Slides

Other ideas

- genAI can help with communications