AI discussion

HPS Collaboration Meeting

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Introduction

- AI usage becoming a hot topic across basically all fields and we need to have a discussion as a collaboration on how we'd like to utilize and regulate its usage within HPS
- Agentic workflows, usage in writing, coding, code review, technical documentation to preserve knowledge transfer
- Common patterns across other collaborations
- Other questions for discussion

Agentic workflows

- Some aspects of our work could be automated, others cannot:
  - ***Tedious and long running tasks*** could be automated & documented with very little input from us; one example: alignment: run long reconstruction jobs, monitor jobs, run millepede (with some human constraints, easy to deviate to non-physical choices), repeat

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  - ***Creative tasks***, such as signal optimization too open ended to fully automate, but clearly AI tools helpful in accelerating progress (making plots, configuring well-documented tools, etc…)

Usage in Writing

- All members of the collaboration sign papers – need to agree upon usage of AI in paper writing process, if at all..
- Suggest discussion should be separated between internal and external facing documents
- Adopt APS guidelines for usage (link)?
  - AI tools may be used to assist with aspects of research, manuscript preparation, and peer review, but substantive AI usage must be disclosed following some standards
- Many AI companies will “watermark” their generated text, allowing external reviewers to know that content was generated by AI

Coding, code review & technical documentation

- Already being used for code development, but should be used responsibly, e.g. authors reading and understanding their changes
- Lots of potential for code review – AI has found multiple bugs already (isolation bug, beam-spot size, etc…) during explorations of the code.
- Technical documentation and knowledge transfer: lots of technical details, from hardware to software that tends to get lost through the generations. AI very good at documenting, in a technical sense, of these tools and procedures. Personally, I think we should utilize AI and formalize technical documentation along these lines

Common patterns from other collaborations

- From a quick search of what other collaborations are doing, common patterns:
  - Humans should stay fully accountable. AI is never an author.
  - Disclose substantive use. APS's definition is a ready-made standard to adopt.
  - Unpublished data and internal documents don't go to public cloud models.
    - Where a collaboration wants LLM help, it uses tools hosted at a lab or covered by an institutional license.
  - Many collaborations are building sanctioned internal assistants rather than banning AI (ATLAS, DUNE, etc).

Other questions for discussion

- ***Data:*** Which tiers can go to which tools: public, collaboration-internal, unblinded data, and draft papers? And whose data rules apply, SLAC's or JLab's?
- ***Code:*** Should AI-assisted code in hps-java or the analysis tools follow normal review only, or carry a disclosure tag in PRs? Who signs off on AI-written code that affects physics results?
- ***Papers and internal notes***: Should the collaboration adopt the APS disclosure standard internally? What about AI in internal review and in reviewing other people's notes?
- ***Tools:*** Does HPS want a sanctioned option, such as a SLAC-licensed tool or one hosted at a lab, so people aren't defaulting to personal accounts?