

SWOT Analysis

Strengths

- The university possesses strong faculty expertise in AI and related fields. This includes researchers engaged in both core AI development and use-inspired applications.
- Some faculty and students have successfully adopted generative AI tools to enhance productivity in research workflows, such as drafting papers and proposals, editing code, and analyzing information.
- There is existing capacity and interest in pursuing interdisciplinary research, which is a key area for AI application.

Weaknesses

- Heavy reliance on a single AI tool (Copilot), which may be perceived as less capable or lower-ranked compared to other competitive tools, could limit the scope and efficiency of research activities and put the university behind institutions utilizing more advanced platforms. Moreover, choosing a fixed set of "confirmed" AI tools for use in the rapidly evolving landscape of AI tools is not responsive to reality.
- There is a general need for more robust and readily available compute infrastructure to support cutting-edge AI research and applications.
- Reliance on free or limited versions of generative AI tools puts researchers at a disadvantage compared to institutions with access to more powerful, subscription-based platforms that offer greater capabilities and potentially better data handling.
- There is a wide range of AI experience and understanding among faculty and students across the university, creating disparities in the ability to effectively leverage AI in research.
- AI research and application are not yet comprehensively or strategically integrated into the broader university-level research priorities and planning.
- Policies regarding access to and use of university data for research purposes, particularly with AI, may be unclear or overly restrictive, hindering potential research applications. Each company that creates or uses an AI tool defines how they protect user information and privacy. You must understand their privacy policy to ensure your use of their tool will not expose personal information.

Opportunities

- There is significant and increasing national funding available for AI research from various agencies (e.g., NSF, NIH) and private sources. Moreover, the current federal government has vowed to keep the funding for AI (among a few other areas) steady, which is unique in the rough funding landscape.

AI Research Working Group

- AI presents a major opportunity to foster and expand effective interdisciplinary collaborations across diverse fields within the university, applying AI to new domains and challenges.
- Implement structured programs, workshops, and speaker series (featuring internal and external experts, including non-faculty practitioners) to improve AI literacy and skills among faculty, researchers, and students across all disciplines. This addresses the need to make students 'AI-ready' and support those new to AI.
- Opportunity to perform a cost-benefit analysis of on-premise vs. cloud compute resources (including both hardware and software) to inform strategic investment decisions and secure dedicated AI infrastructure
- Create clear, secure, and streamlined policies and infrastructure for researchers to access and utilize university data ethically and effectively for AI research, while ensuring privacy and compliance. However, it must be kept in mind that different disciplines have different priorities and approaches
- Create policies or incentives that recognize and reward faculty and students who effectively integrate AI into their research, encouraging broader adoption and innovation. We want to also ensure that faculty/students are not penalized for not wanting to use AI in their work.
- Facilitate smooth transfer of AI-powered innovation at CU Denver to the market.
- Actively seek partnership and sponsorship opportunities with internal and external parties, including government, industry, other higher education institutes, student organizations, etc.

Threats

- Universities with greater resources, clearer policies, and dedicated funding may attract top faculty, students, and research grants.
- Evolving regulations concerning AI development and data privacy could impose restrictions or slow down research progress if the university is not prepared to navigate them.
- The fast pace of AI development means that infrastructure, tools, and expertise can quickly become outdated, requiring continuous investment and adaptation to remain competitive.
- Responsibility Assignment
- Clear mechanisms must be in place to assign responsibility when AI systems cause harm or make errors.
- This includes defining who is accountable—developers, users, or organizations.
- Regulatory Compliance
- Ensuring that AI systems comply with existing laws and regulations is essential.

AI Research Working Group

- This includes adhering to data protection laws and ethical guidelines.
- Oversight and Monitoring
- Continuous monitoring and auditing of AI systems are necessary to ensure they operate as intended and to address any issues that arise.

SOAR Analysis

Strengths

- Passionate, cross-disciplinary student and faculty teams driving innovation and identifying the potential of Generative AI tools and predictive modeling techniques.
- Use of AI tools has been shown to enhance productivity.
- Pilot projects are already generating promising results.
- Numerous faculties use AI platforms such as Amazon Web Services (AWS) and MS Azure for their research that uses AI/ML. In some cases, these platforms are paid for from their grants.
- Evidence that faculty and staff are taking advantage of online courses to learn and apply AI. In some cases, they are willing to explore in their own time and fund at their own expense.

Opportunities

- Launch a research seminar series to bring in external experts and increase visibility.
- Build student-led open-source tools or publish datasets to promote open science.
- Collaborate with other departments to co-author interdisciplinary grant proposals.
- Develop AI-based platforms for cross-discipline research support and access to cloud services (including training)
- AI usage within the arts is limited and very faculty dependent. There were claims that there were no faculty incentives or recognition to look at AI and these are needed.
- In some cases, AI can assist with accelerating research methodologies. As an example, a faculty is using AI to annotate data using LabelStudio, presumably for supervised learning.
- Allowing faculty researcher access to internal student data for modelling and prediction.
- Incentives could help drive AI drive innovation in interdisciplinary research projects, but as of now there are no incentives around interdisciplinary work.

Aspirations

- Train the next generation of AI researchers and innovators.
- Create a pipeline for undergraduates to enter AI research and graduate programs.
- Publish in top-tier ML/AI conferences within 2–3 years.
- Researcher training on how to use/leverage cloud-based compute resources for AI/ML. Most researchers that want to apply power cloud AI/ML are not software engineers or programmers.

AI Research Working Group

- Desire for better accountability on how AI is used in training models. For example, how are CU Denver's Zoom recordings being used.
- CU Denver leadership should work with Faculty Assembly in determining what AI policy and governance is needed as this is the best way to engage faculty.
- Faculty should have a clear understanding of the consequences of using outside tools including who owns Intellectual Property (IP) when using third party AI tools paid for by faculty.
- Researchers should understand the ethical issues with AI such as bias and data privacy.

Results

- Increase the number of funded research projects and grants involving AI.
- Measurable increase in cross-departmental research outputs using AI.
- Recognition in national AI research rankings or invited speaker slots.

Use Cases for AI in Research

1. AI for Research Productivity and Grant Writing Support

Expected Benefits:

- Identifies funding opportunities/directions through AI-driven insights.
- Identify research collaborator network.
- AI-assisted research analytics.

Challenges/Risks:

- AI-generated text may lack originality and nuanced argumentation.

Policies (Guidelines):

- AI-generated content must be reviewed and edited by researchers.

2. Machine Learning and AI for Data Processing and Analysis

Expected Benefits:

- Automates complex data processing tasks.

Challenges/Risks:

- Risk of misinterpretation of AI-driven results.

Policies (Guidelines):

- Provide AI training for researchers handling data analysis.

3. Ethical AI and Policy Guidance for Researchers

Expected Benefits:

- Promotes responsible AI use in research.

Challenges/Risks:

- Potential misuse of AI in research.

Policies (Guidelines):

- Establish clear ethical AI guidelines for research projects.

4. Use of Generative AI in Arts and Research Communications

Expected Benefits:

- AI-generated content can make complex research findings more accessible to diverse audiences

AI Research Working Group

- Researchers can use AI to create graphical abstracts and explore new forms of expression

Challenges/Risks:

- Determining ownership and proper attribution of AI-generated context is complex.
- AI models can misrepresent research findings.

Policies (Guidelines):

- Establish consistent standards for attributing AI-assisted contributions.
- Avoid models trained on copyrighted or non-consensual data.
- Require faculty/student review and editorial oversight.

5. Cloud AI/ML Infrastructure Training/Investment for CU Denver Researchers

Expected Benefits:

- Provides scalable AI/ML computational resources.
- Enhanced security.

Challenges/Risks:

- Potential data security vulnerabilities and cost.

Policies (Guidelines):

- Provide cloud AI training sessions for researchers.

Policy Recommendations for the Use of Generative AI in Research

The use of generative AI tools to support the design, execution, refinement, and writing of research is encouraged, provided such use aligns with the ethical and professional standards of the relevant academic discipline.

Researchers are expected to:

- **Track AI Usage:** Always be prepared to provide collaborators, journals, or funding agencies with a clear statement describing how generative AI was used at any stage of the research process (e.g., literature review summarization, code generation, data analysis, or writing assistance). This information may be required in the methods or acknowledgments section of a thesis, dissertation, publication, or grant.
- **Adhere to Disciplinary Norms:** AI use should conform to the accepted practices of the discipline. Some fields may permit AI-assisted drafting, while others may restrict its use to editorial support or prohibit it entirely in authored sections.
- **Avoid Misrepresentation:** Presenting AI-generated content as one's own intellectual contribution without proper attribution may constitute a violation of academic integrity policies.
- **Use of personally licensed/purchased 3rd party AI tools** (not necessarily approved by OIT) and use in research and implications resulting from new Intellectual Property development. Many AI tools for research are highly specialized -- do these need one-off approvals? What about for use in pre-proposal stage?
- **Use free cloud-based compute services/resources for research**, e.g. AWS ML in Education, Google Colaboratory that is not Microsoft. Is this not similar to faculty researcher use of similar cloud/compute resources such as Overleaf, Github?
- **Policies regarding (responsible) use of AI in (under) graduate student research**, including research topic generation, and thesis/dissertation writing. Prepares graduate students for AI-integrated research environments. Inconsistent AI training across departments. Policies needed for acceptable AI-assisted research practices.