RESEARCH
UNIVERSITY OF MICHIGAN

ARTIFICIAL INTELLIGENCE RESEARCH COMMITTEE

RECOMMENDATIONS REPORT

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University of Michigan
Artificial Intelligence Research Committee
Recommendations Report

August 30, 2024

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Executive Summary

The University of Michigan (U-M) is a prolific producer of research-based knowledge and innovation. The advent of fast-evolving tools and methods associated with the term “Artificial Intelligence” (AI) offers unprecedented opportunities to pave the way for new areas and methods of inquiry, and to accelerate our pace of discovery. At the same time, it is important to reflect on the benefits, risks, and potential that such technologies can provide.

To put U-M in the best possible position in this new era of AI, former Vice President for Research, Rebecca Cunningham, charged a high-level expert committee in September 2023 to advise the Office of the Vice President for Research (OVPR) on how to best support the university’s opportunities, performance, and policies regarding AI-related research and research that uses these technologies. This AI Research Committee was tasked with delivering two reports to OVPR: 1) a current state report focused on the question, “what do we have?”; and 2) a recommendation report to address the question, “what do we do?”.

Building upon its initial findings presented in the December 2023 current state report, the AI Research Committee developed this recommendation-focused report structured on the following questions and yielding the subsequent results:

1. What *key investments* best position U-M for **national/global leadership in AI-related research**?

   Investments to support existing strengths
   - ➢ Computational infrastructure expansion
   - ➢ Sustainability of large-scale computing investments
   - ➢ New human capital
   - ➢ Human-centered AI initiatives with positive global impact
   - ➢ Support of existing centers of excellence
   - ➢ Opportunities to elevate AI at U-M
   - ➢ Education of the campus community
   - ➢ Bold visions for a futuristic brave new world of AI

   Strategies to increase U-M’s state of readiness for funding opportunities
   - ➢ Influence national AI strategy
   - ➢ Recruit dedicated scientific grant writers for AI opportunities
   - ➢ Create a centralized AI funding information hub
   - ➢ Promote interdisciplinary collaboration
   - ➢ Improve opportunities for networking
   - ➢ Leverage existing U-M strengths and explore less traditional funding sources
   - ➢ Create seed/pilot funding mechanisms

   AI research consulting services to provide and foster expertise
   - ➢ Include AI consulting as part of a larger research data services strategy
   - ➢ Recruit, train, and retain staff analysts engaged in AI-consulting and data analysis
   - ➢ Cultivate a culture of future readiness in campus AI consulting
   - ➢ Organize a national applied AI symposium of practice to support and highlight AI consulting efforts
   - ➢ Support and recognize faculty and staff who are helping the campus to get “AI-ready”

2. What *innovative forms of internal coordination and collaboration* best position U-M to produce **more competitive proposals** for external funding opportunities and **high-impact strategic partnerships**?

    - ➢ Establish an AI committee to advise OVPR and assist in implementing and adapting the recommendations from this report
    - ➢ Develop a web presence for AI-related research resources at U-M
    - ➢ Facilitate external partner interactions through existing and new channels
    - ➢ Focus one of the themes for the next round of BOLD challenges on AI+X

3. What *ethical and compliance-related guidance* should be developed to support researchers who develop or use AI tools to **advance U-M's vital public mission**?

    <u>Existing guidance to be modified</u>
    - ➢ Update the *University's Guidelines For Authorship And Avoiding Authorship Disputes* to include a statement on AI
    - ➢ Review of existing research policies and/or guidelines by relevant OVPR units/programs to identify ways to help U-M researchers navigate the responsible and ethical use of AI in their work

    <u>New guidance to be established</u>
    - ➢ Adopt a suggested set of broad principles for the responsible and ethical use of AI in research
    - ➢ Lead in the development of high ethical standards for the use of AI in research
    - ➢ Ensure that guidelines on the use of AI across the institution - from academics to research to administration - are aligned and congruent

The AI Research Committee concludes that there are several steps that the university can take to: increase the institution's competitiveness in AI-related research and research that uses these technologies; expand opportunities for participation in AI-related research at U-M; and develop policies and practices to ensure that U-M research complies with all applicable laws and exemplifies high ethical standards. We are encouraged by the commitment to "Expand the development and deployment of artificial intelligence and data science by investing in supercomputing infrastructure, state-of-the-art high-speed storage, and specialized generative AI tools that will expand university-wide capabilities" as noted in the newly released Vision 2034. By embracing these tools with a judicious and forward-thinking approach, U-M is well-positioned to continue breaking ground in academic excellence and contributing to innovation and service to the common good.

Approach

The University of Michigan (U-M) is a global leader in research. From the quality and breadth of its training opportunities for undergraduate and graduate students, to the scale of its discoveries across diverse topical areas, U-M is an energetic producer of research-based knowledge and innovation. Michigan's effectiveness in so many areas of research stems from the inventiveness and perseverance of its faculty, staff, and students. Its success is bolstered by the focus and values that its vital public service mission provides.

Over time, new research tools and methods are developed that expand Michigan's capacity for cutting-edge advances in inquiry, analysis, and interpretation. A fast-evolving set of tools and methods associated with the term "Artificial Intelligence" (AI) are playing this role now. AI has already created many new opportunities for U-M researchers, as U-M is home to many leading thinkers in AI and AI-related fields, and U-M's AI-based centers have gained worldwide attention.

While great things are happening at U-M, there is a widely shared sense that AI-related tools and methods have the potential to do much, much more. The 2023 report by U-M's Generative Artificial Intelligence Committee, for example, offers important perspectives on how AI tools can impact teaching, research, and service activities at U-M and provides a springboard for more focused conversations.

To put U-M in the best possible position to advance its vital research mission in this new era, former Vice President for Research, Rebecca Cunningham, charged a high-level expert AI Research Committee (Appendix A) in September 2023 to advise the Office for the Vice President for Research (OVPR) and U-M on how to:

- Facilitate communication, coordination, and collaboration among committee members regarding AI-related research opportunities.

- Identify current and potential:
    - AI-related and AI-interested researchers and resources at U-M.
    - External funding awards and opportunities in areas that use, or are affected by, new and emerging AI technologies.
    - Partnerships with industry, other universities, and other organizations that can accelerate U-M's pursuit of its AI-related research goals.
    - Guidance on ethical implications and compliance policies.

- Develop recommendations on ways to: (1) increase U-M's competitiveness in AI-related research and research that uses AItechnologies, (2) expand opportunities for participation in AI-related research at U-M, and (3) develop policies and practices to ensure that U-M research complies with all applicable laws and promotes the highest ethical standards.

In December 2023, the AI Research Committee delivered a report offering information about U-M's current state in each of these domains. Following the initial charge to the committee, and building upon its initial findings, the committee has developed this recommendation-focused report that analyzes the following:

1. What *key investments* best position U-M for **national/global leadership in AI-related research**?

2. What *innovative forms of internal coordination and collaboration* best position U-M to produce **more competitive proposals** for external funding opportunities and **high-impact strategic partnerships**?

3. What *ethical and compliance-related guidance* should OVPR develop to support researchers who develop or use AI tools to **advance U-M's vital public mission**?

To achieve these goals, the AI research committee worked through three subcommittees that pursued the questions described below.

Key Investments Subcommittee (Vice Chair: Bhramar Mukherjee) *Focus:* What *key investments* best position U-M for **national/global leadership in AI-related research**?	
Objective	**Deliverable**
1. Examine if there are specific OVPR or U-M investments in AI-related research that can make a transformational difference in the short and long-term. In particular, explore if there are opportunities that are "uniquely Michigan" in the sense that they have a high likelihood of producing national/global leadership opportunities.	Recommendations regarding opportunities, including faculty hires, for U-M to support strengths in AI-related research.
2. Understand what grant opportunities are on the horizon and how OVPR can prepare for and accelerate teams towards success in these opportunities.	Recommendations regarding upcoming grant opportunities and strategies for OVPR to strategically support U-M's state of readiness to seize them.
3. Explore if AI research consulting services should be integrated into the OVPR data services strategy that is currently being developed and what this might look like.	Recommendations regarding the need for, and elements of, potential AI research consulting services through OVPR's data service strategy.

Internal Innovation Subcommittee (Vice Chair: H.V. Jagadish) *Focus:* What *innovative forms of internal coordination and collaboration* best position U-M to produce **more competitive proposals** for external funding opportunities and **high-impact strategic partnerships**?	
Objectives	**Deliverables**
1. Explore with the entire Committee if there are a set of high-level "block-M" AI-related research objectives that could provide the focal point for future coordination and cooperation efforts.	Recommendations for topics where better internal coordination can give U-M new strategic advantages in funding and partnerships.
2. Work with key stakeholders to better understand how U-M can facilitate more frequent high-level partnerships with corporate and other partners.	Recommendations about how to more effectively facilitate and scale external partnerships that can advance AI-related research at U-M.
3. Determine if and how it would be beneficial for OVPR to regularly convene AI-related organizations/institutes at U-M as a means to facilitate information exchange, collaboration, and U-M's capacity for innovation.	Recommendations regarding opportunities for highly productive convenings of AI-related organizations/institutes at U-M.

4. Examine opportunities for U-M to more systematically communicate its AI-related research activities in ways that help internal and external audiences navigate U-M's AI research resources and collaborations.	Recommendations regarding how U-M could best communicate its AI-related research activities, including the possible development of umbrella websites or similar structures to make U-M's AI research landscape easier to understand and navigate.

Ethics & Compliance Subcommittee (Vice Chair: Jess Peirson) Focus: What *ethical and compliance-related guidance* should OVPR develop to support researchers who develop or use AI tools **to advance U-M's vital public mission**?	
Objective	**Deliverable**
1. Determine which existing U-M research guidelines need to be modified to manage new AI-related research opportunities and challenges.	Recommendations for changes to existing U-M research guidelines that help researchers most effectively advance our public mission.
2. Generate guidance to help U-M researchers and the broader research community use AI responsibly, ethically, and in ways that contribute new knowledge and explore how the guidance would be best deployed (i.e., online training, workshop, webpage, etc.).	Recommendations for "101-level" things that all researchers should know about and/or do when using or developing AI in grant proposals, papers, peer reviews, and research. Recommendations will recognize important discipline-specific considerations and describe vehicles for delivery of this guidance.

The recommendations provided in the following section have generally been endorsed by the full committee. In the instances where a recommendation did not meet consensus, the diverging viewpoint(s) are indicated in the description of the recommendation.

Recommendations for Key Investments

Objective 1: Examine if there are specific OVPR or U-M investments in AI-related research that can make a transformational difference in the short and long-term. In particular, explore if there are opportunities that are “uniquely Michigan” in the sense that they have a high likelihood of producing national/global leadership opportunities.

Recommendations:

1. **Invest in computational infrastructure expansion**
   To support the development of large AI models (including but not limited to large language models and foundation models) and to enable groundbreaking research in AI, significant computational infrastructure is essential. We recommend a substantial investment in high-performance computing resources, including hardware accelerators and cloud computing platforms, to provide researchers and students with the computational power necessary to effectively tackle complex AI problems.

2. **Make and sustain large-scale computing investments**
   To maintain U-M's leadership and excellence at the forefront of science and technology, sustained investment in large-scale computing is crucial. While the first recommendation argues for a rapid expansion of the infrastructure, this second recommendation focuses on sustainability. As AI continues to evolve rapidly and the demand for computational resources grows, ongoing financial support and creation of fair use policies across units will be necessary to ensure that U-M remains at the cutting edge of AI research and education.

   In tandem with recommendation 1, we urge the university to:

   - Subsidize costs associated with large-scale computing to make it affordable and accessible. This may involve the identification of a sustainable funding model to support these computing costs.
   - Identify resources to be made available at the unit and university level, respecting the diverse and specialized needs across all three U-M campuses.
   - Develop external and global partnerships, including with national labs and technology companies, in areas of massive computation, data storage, and optimal workflow design.

3. **Invest in new human capital**
   To stay competitive with our peers, we recommend initiation of multiple new AI faculty lines, at junior and senior levels, in traditional quantitative departments as well as in departments not traditionally thought of as centers of AI expertise (e.g., substantive areas where researchers are transforming their home discipline with AI). While some units may already have ample incentives to prioritize AI in their hiring plans, university leadership may initiate a campuswide cluster hire program in AI with a streamlined application process for the participating units. We also recommend that close attention be paid and investments be made as needed to retain the faculty in this area, as peer institutions and industry will also pursue aggressive hiring.

4. **Leverage U-M strengths to further human-centered AI initiatives with positive global impact**
   The committee feels very strongly about investing in strategic areas of AI that have the possibility of improving the human condition. We identified five areas of disciplinary strength at U-M where the AI industry, corporate, and private sector may not have significant depth of interest and expertise. We list them below as current examples, but other areas could be identified in the future.

a. **Climate action, sustainability, and human justice:** Investments in sustainable AI would leverage U-M's legacy of environmental research and stewardship and could help address vital issues such as addressing climate change, predicting and mitigating natural disasters, and optimizing renewable energy use.

b. **Human health and well-being:** This area was identified as an existing pillar of strength in our initial report, with E-Health and Artificial Intelligence (e-HAIL), Center for Global Health Equity (CGHE), and Precision Health being hubs for critically important work in AI and health.

c. **Social and economic solutions:** AI for social and economic solutions that will benefit marginalized groups could be an important area of focus, given U-M strengths. For example, U-M has a strong center on poverty solutions with a long-standing presence and partnership in the Detroit area. AI researchers can work in tandem with center investigators to discover new solutions and technologies to address inequality. The Institute for Social Research also has several projects using AI and relevant technologies to create and analyze data resources related to criminal justice, wealth inequality, migration, and economic growth.

d. **Life-changing education:** Development of AI tools to improve and enhance learning outcomes would tap into the university's history of excellence in education research.

e. **Scientific discovery and engineering innovations:** AI foundation models are poised to create a significant transformation in how we do science and engineering. Coordinated investments in theoretical aspects of this field, as well as in development and application, will establish U-M as the leader in this very critical area.

5. **Support existing centers of excellence with new investments**
Our work in the Fall identified several outstanding centers and initiatives on campus that are already nationally prominent in AI. For example, Michigan Institute for Data Science (MIDAS), Michigan AI Lab, e-HAIL, Michigan Institute for Computational Discovery and Engineering (MICDE), Michigan Integrated Center for Health Analytics & Medical Prediction (MiCHAMP), and CGHE are a few centers that were named as intellectual hubs of AI research in our current state report. While it should be taken into account that several of the directors of the aforementioned centers and institutes are members of the AI Research Committee, the majority of the committee endorses this recommendation for enhanced support for such centers as they pivot to the era of generative AI, with the AI-focused cyberinfrastructure investments described above.

6. **Reflect and elevate AI at U-M**
The majority of the committee thought that current U-M entities may consider adapting their unit names and acronyms to reflect and elevate AI. Some committee members did express concern, however, about modifying names of units that have long-established reputations to reflect topics that are ever-changing. They also noted that the original names may already be broad enough to encompass AI. The unit leaders, therefore, should consider this counterargument before making any permanent changes. Some ideas for consideration, however, include:
    - MIDAS might transition to MIDAIS, so as to include AI in the title.
    - The department of Computer Science and Engineering could highlight AI with: CSAIE.
    - The School of Information could incorporate AI in the name, such as the School of Information and Artificial Intelligence.

7. **Educate the campus community**
The committee felt that democratization of knowledge regarding important AI tools and how to evaluate them is needed as researchers, including faculty, staff and students, grapple with the explosion of

innovation in this area. Some committee members suggested a dedicated campaign to educate campus on AI and meet learners at different levels. Showcasing and walking through sample use cases could also serve as a good template for education.

8. **Consider defining bold visions for a futuristic brave new world of AI**
   Consistent with recommendation 4 on human centered AI, committee members also deliberated on several "blue sky" ideas. These involved elevating the stature of AI on campus, bringing cross-disciplinary teams together, and embracing a broad view of AI. Several ideas were put forward that require considerable investment, reorganization, and strategic planning. Committee members were not certain about the feasibility of these ideas; however, with campus 2034 and 2050 in the planning phases, we include some aspirational ideas for potential traction and excitement for the future. It should be noted, however, that not all committee members agreed with this recommendation. One member shared that they would rather strengthen existing institutions than invest in creating new ones, and another appreciated the tentative wording of this recommendation and acknowledged that organizational changes may make sense in the future, but stressed that "elevating the stature" and "defining bold visions" are far from sufficient bases for such major reorganization initiatives.

   a. **Creation of a School [or institute] of Computer, Human and Artificial Intelligence (SCHAI, pronounced "Sky": our "BLUE SCHAI")**
      Understanding that a new school or institute requires careful thought, long-term planning, and consideration, one idea suggested by some committee members was a new school that could bind components across the university focused on cognition, neuroscience, robotics, cloud computing, Internet of Things, and AI for human benefit. By fostering collaboration among experts from diverse backgrounds, SCHAI would facilitate interdisciplinary research and innovation and drive advancements in AI technologies and their real-world applications. For expanded ideas on this, see this article by committee member Gus Evrard.

   b. **Creation of a College [or institute] of Computing and AI**
      Less ambitiously in a nearer term, U-M may consider the idea that several universities (such as UC Berkeley, Cornell, MIT, Wisconsin and USC) are pursuing, which is to form a school or institute of computing. This will elevate AI's presence at the institutional level.

Objective 2: Understand what grant opportunities are on the horizon and how OVPR can prepare for and accelerate teams towards success in these opportunities.

In our approach to assessing the landscape of AI-related funding, we conducted a comprehensive search across various sources, including the National Science Foundation (NSF), the National Institutes of Health (NIH), and U-M Research Foundation Partnerships. Our analysis revealed several key trends in recent grant funding allocations. Below are the top themes and key findings for existing funding opportunities:

1. **Interdisciplinary collaboration:** There seems to be an emphasis on collaboration across diverse fields such as humanities, geosciences, healthcare, engineering, and biomedical research. This breadth of scope highlights a recognition of the importance of multidisciplinary approaches in advancing AI research. This is a distinctive strength of U-M, and we should highlight and support interdisciplinary collaborations that may be responsive to such funding opportunities.

2. **Advancing national AI research:** There is a strategic emphasis on enhancing expertise and technology at a national level to bolster AI research capabilities. This thrust underscores the commitment to positioning the country at the forefront of AI innovation and development.

3. **Capacity building & education:** Significant investments are directed towards cultivating a skilled AI workforce and promoting innovation through capacity building and educational initiatives. This investment reflects the recognition of the critical role that education and skill development play in driving AI advancements and ensuring competitiveness in the global AI landscape.

4. **Ethical & responsible AI deployment:** There is a growing focus on addressing societal impacts and ensuring responsible development practices in AI deployment, indicating a commitment to ethical considerations. This focus highlights a recognition of the ethics inherent in AI development and deployment, and a commitment to proactively addressing them. This is an area where U-M has provided global leadership, which we should leverage and enhance.

5. **Targeted support for AI applications:** Funding is directed towards supporting AI research in critical application fields such as healthcare delivery; research in cancer, HIV, addiction; and cybersecurity. This targeted support for specific application areas reflects the recognition of the potential of AI to drive advancements and innovations in these substantive areas.

Each of these findings describes a distinct aspect of the funding trends, showcasing the diverse priorities within AI-related funding initiatives.

Recommendations:

1. **Influence national AI strategy**
   With recent momentum in generative AI and scientific foundation models, U-M is in a unique position to not only prepare for AI-related grant opportunities, but to also assume national leadership in AI. Towards this end, U-M should consider establishing and leveraging multi-university consortia and national laboratory partnerships, providing guidance for the national AI strategy, and influencing the emerging funding landscape.

2. **Recruit dedicated scientific grant writers for AI opportunities**
   Fund positions to facilitate large data science/AI grant proposal development. This would require PhD level science writers with AI expertise that would help with content development, thus distinct from traditional editing roles. For example, this resource could be integrated into the research development teams that currently exist in OVPR, or be embedded in key AI-related communities that are nodal for relevant researchers (e.g., MIDAS, Michigan AI Lab, e-HAIL, MICDE, MiCHAMP, and CGHE as well as AI-focused departments and colleges (e.g., SI and EECS). While the majority of the committee supports this recommendation, there was some thought that grant writing support should be generic rather than technical.

3. **Create a centralized AI funding information hub**
   This hub would ideally include all things about AI funding and serve as a starting point for exploration for researchers seeking funding in this space. This information can be prominently placed on current sites such as https://research.umich.edu/ or https://orsp.umich.edu/ as one of the high-interest research funding areas, or alternatively, as a component of the web presence as described in the Internal Innovation recommendation objective 2.1 below.

4. **Promote interdisciplinary collaboration**
   Establish regular opportunities for cross-disciplinary collaboration, especially in emerging areas like AI ethics, AI and humanities, and AI and performing arts. Explore collaborations connecting humanities, law, and social sciences with computational sciences to write innovative grants with high social impact.

5. **Improve opportunities for networking**
   Enhance connectivity among AI researchers using existing search tools like Michigan Experts, but perhaps an AI edition of it. The committee also envisioned creation of a funding search portal with interactive communication tools. For example, a platform where one could search for current and upcoming funding opportunities and if one had an idea for a specific funding opportunity, they could pitch the idea and invite other campus researchers in AI to join the project as a collaborator using the portal.

   When appropriate, OVPR should also connect some of these newly formed AI teams to the pilot funding opportunities described in 2.7 (and/or provide access to OVPR's AI grant writers described in 2.2). Make efforts to promote this platform to be actively used and closely embedded in networking activities already taking place in various U-M units engaged in AI research, such as MIDAS.

6. **Leverage existing U-M strengths and explore less traditional funding sources**
   Capitalize on AI grant opportunities in health sciences, biosciences, CSE, computational physics and explore funding beyond NIH and NSF, such as diverse federal funding bodies (e.g. NSA, DoE, and DoD), local governments, and private entities. Create a special team within OVPR that specifically targets the identification of such grant opportunities, especially larger and more complex grants, such as center grant proposals.

7. **Create seed/pilot funding mechanisms**
   Create new pilot funding opportunities to position teams for large extramural funding opportunities in a nimble manner.

> **Objective 3:** Explore if AI research consulting services should be integrated into the OVPR data services strategy that is currently being developed and what this might look like.

The faculty and staff survey conducted by the OVPR research data services (RDS) team in January and February of 2024 revealed that the faculty need for AI-related consulting across the campus is still limited relative to other larger needs such as data cleaning, management, coding, and statistical analysis. There is a huge unmet need, however, for professional and skill development amongst analysts and programmers. We believe that AI-augmented data analysis is the future of data services and that U-M should be a leader in this work. The following recommendations are investments and actions that the committee thinks could potentially be part of RDS expansion as it relates to AI-consulting and campus RDS support.

Recommendations:

1. **Include AI consulting as a part of RDS**
   As indicated in the Fall report, it will be important to develop and deliver consultation specific to the needs of different types of scholarly communities: AI researchers, applied researchers, researchers focused on ethics in AI, and novice learners interested in learning AI for their domain research. We identified several areas of need:

   - Education on:
     - AI coding and data analysis chatbots/tools (github copilot, chatGPT code interpreter)
     - The basics of various AI technologies, their pros/cons, and recommended use cases

   - Support for:
     - Leveraging generative AI models for content creation (e.g., through APIs)
     - Building/extending transparent open source AI models

- Guidance on:
    - The most appropriate AI tools (e.g., generative AI) for specific projects/tasks
    - When to use commercial vs. open source models
    - How best to use and evaluate AI models, including the fairness of algorithms
    - Creation and evaluation of new curated models

2. **Recruit, train, and retain staff analysts engaged in AI-consulting and data analysis**
   Recruitment of staff analysts with AI expertise on campus is critical and will likely require a modified payscale. Education in AI for our existing staff scientists and data analysts is also a pressing need that RDS could address. In particular, growing and sharing expertise in prompt learning is critical for analysts, programmers, and students.

3. **Cultivate a culture of future readiness in campus AI consulting**
   Consultants and practitioners should have the plasticity to stay engaged, updated, and informed about advances in AI. It will be important for U-M to foster a culture of experimentation for future AI innovations. Sustained investment in training is recommended for analysts.

4. **Organize a national applied AI symposium of practice to support and highlight AI consulting efforts**
   We have seen great enthusiasm and interest in the AI programming from MIDAS and MICDE, with more than 300 registered in person attendees at their recent symposiums. The majority of the committee supports proposing a national hybrid AI symposium that would be organized by RDS and mostly consist of tutorials, workshops, and use cases that will target analysts and programmers across campus and nationwide to grow and update their skill sets in AI, and share analytics and optimal workflows.

5. **Support and recognize faculty and staff who are helping the campus to get "AI-ready"**
   Appropriate incentive structures are needed for faculty and staff who donate their time consulting to help others on campus with AI-related services and questions. The majority of the committee supports RDS exploring opportunities to catalyze this (e.g., initiating an OVPR award/recognition for AI-support staff), as long as any potential equity concerns with such an incentive are addressed.

Recommendations for Internal Innovation

Objective 1: Determine if and how it would be beneficial for OVPR to regularly convene AI-related organizations/institutes at U-M as a means to facilitate information exchange, collaboration, and U-M's capacity for innovation.

Recommendation:

1. **Establish an AI committee to advise OVPR and assist in implementing and adapting these recommendations**
   U-M is big and diverse, with multiple people from different parts of the university often working simultaneously on a topic or interacting with an external partner with no knowledge of overlapping efforts. Better communication can lead to greater success. However, diversity of thought and proliferation of individual initiative are both great strengths of U-M, which we must be careful not to lose.

   We recommend that a committee or council with an initial term limit of 3 years be established to represent diverse views on AI research to OVPR. After this initial period, a determination can be made about its value and whether continuation is desired. While this committee will assist in implementing (and refining, as needed) recommendations in this report that are approved to move forward, it will specifically be responsible for overseeing recommendations 2.1 and 3.1 below, and also oversee Key Investments

objective 2.3.

Objective 2: Examine opportunities for U-M to more systematically communicate its AI-related research activities in ways that help internal and external audiences navigate U-M's AI research resources and collaborations.

Recommendation:

1. **Develop a web presence for AI-related research resources at U-M**
   The committee suggests that OVPR host a lightweight web presence that would provide the U-M research community with information about available AI-related tools and resources. The committee emphasizes the importance of being mindful not to duplicate existing efforts, but rather to compile links to these resources in one place. Example resources to be highlighted include the various units that have an intersection with AI, the Gen AI page maintained by U-M ITS, the research best practices page maintained by MIDAS, guidelines for ethical use of AI in research, and the funding opportunities as described above in the Key Investments objective 2.3.

Objective 3: Work with key stakeholders to better understand how U-M can facilitate more frequent high-level partnerships with corporate and other partners.

Recommendation:

1. **Facilitate external partner interactions through existing and new channels**
   As part of this review, a subset of the Internal Innovation subcommittee met with the Executive Director of Licensing and Strategic Alliances at Innovation Partnerships to discuss potential industry partnerships in AI-research related contexts. The group recognized that there can be several points of connection at the university with external partners and that, in many cases, there can be unit-driven priorities that create a fragmented ecosystem and cause a perceived lack of internal coordination. Having a team of "points of contact", such as through the Corporate Alliances team at Innovation Partnerships and teams within schools and colleges, who are closely engaged with these external partners and have deep knowledge of how they operate, can help us develop stronger engagements in AI-related work. While far from perfect, these coordination mechanisms appear to work reasonably well to support, but not replace, PI-initiated partnerships. The committee recommends that this work continue and that the AI advisory committee might be another resource to assist faculty looking for guidance and connections in order to engage with external parties. This committee would not coordinate or facilitate such partnerships, but rather would provide input and insight when requested.

Objective 4: Explore with the entire Committee if there are a set of high-level "block-M" AI-related research objectives that could provide the focal point for future coordination and cooperation efforts.

Recommendation:

1. **Focus one of the themes for the next round of BOLD challenges on AI+X**
   OVPR currently runs a successful Bold Challenges program that focuses each year on identified themes. This is a ready-made vehicle through which to build teams across disciplinary boundaries and the committee suggests that a challenge be run with an AI focus. Given that AI by itself is so broad, a more targeted approach (AI + X) should be used.

Recommendations for Ethics & Compliance

Objective 1: Determine which existing U-M research guidelines need to be modified to manage new AI-related research opportunities and challenges.

Recommendations:

1. **OVPR should update the University's *Guidelines For Authorship And Avoiding Authorship Disputes* to include a statement on AI.**
   Many organizations and publishers explicitly prohibit AI tools from being listed as an author. When U-M authors use AI tools and applications in their research and scholarship, they must take full intellectual responsibility for their use of the output of AI in their creative and research products, including publications. Authors should strive for transparency and follow the university's principles for the responsible and ethical use of AI tools in their research and creative products. As standards for acknowledging the use of AI are evolving, authors should adopt domain-specific best practices for acknowledging and documenting their use of AI.

2. **The following OVPR units/programs, all of which anticipate some degree of AI-related impact on their business practices or oversight functions, should review their respective research policies and/or guidelines to identify ways to help U-M researchers navigate the responsible and ethical use of AI in their work:**
   - Export Controls
   - Human Research Protections Program
   - Innovation Partnerships
   - Research Information Security
   - Research Integrity
   - Research Data Stewardship Initiative

   Because the landscape around AI and research practice continues to rapidly evolve, OVPR needs to be able to communicate guidance/policy information in a timely manner and must remain flexible while working to ensure compliance. The committee recommends that OVPR units carefully consider how best to inform the research community of potentially evolving standards, which may or may not include specific changes to current U-M policies.

   Additionally, OVPR should task all of its safeguard/compliance and relevant support units, even those that currently do not anticipate direct impacts from AI, to monitor for regulatory changes related to AI research and to keep abreast of activities and messaging from national organizations and peer institutions.

   OVPR should share guidance and policy updates with school and college research offices across all three U-M campuses to help inform the units as they consider the opportunities and implications of AI within their own research areas.

Objective 2: Generate guidance to help U-M researchers and the broader research community to use AI responsibly, ethically, and in ways that contribute new knowledge and explore how the guidance would be best deployed (i.e., online training, workshop, webpage, etc.).

Recommendations:

1. **OVPR/U-M should adopt the following set of broad principles for the responsible and ethical use of AI in research.**
   Principles for the Responsible and Ethical Use of AI in U-M Research and Scholarship
   U-M recognizes the opportunities that advancements in AI and machine learning (ML) technologies hold for the pursuit of research and scholarship. The university also recognizes that there will be discipline-specific differences in how individuals engage with AI. All U-M individuals who intend to incorporate AI in their research and scholarly activities, however, are expected to understand and follow, as applicable to their work, the broad principles outlined below:

   - Integrity - Individuals are ultimately responsible for the content and integrity of the work that they produce at the university, including content or results generated through the use of AI.
   - Disclosure and Transparency - The role of AI in the production of research and scholarship must be disclosed when it is substantive.
   - Implementation - The methodology for AI use in research and scholarship should be fully documented, following domain-based best practices. These will include the application and model used, how it was implemented, training data (if known), input data, and other details that could affect the reliability, validity, and reproducibility of the work.
   - Bias - Individuals using AI in their research and scholarship should understand and consider that there may be inherent, and potentially pernicious, biases in the models themselves, the data used to train the models, and in the input data being analyzed.
   - Risks - Researchers must respect the security and confidentiality of sensitive data (e.g., personal health information, student and employee records, export controlled data), copyright and intellectual property concerns, and other potential privacy risks. All applicable U-M policies and external rules and regulations must be followed. Confidential and/or other sensitive information should not be input into public AI applications. Researchers should also consider risks resulting from the deployment of AI systems.
   - External requirements and expectations - U-M individuals are expected to understand and adhere to the AI-related policies and guidelines of the external scholarly entities with which they engage, including research funders, publishers, journals, societies, and governmental agencies. This applies whether the engagement involves submission or sharing of a research or scholarly work, submission of a funding application, or service in a review capacity.

2. **In addition to the principles outlined above, the committee strongly feels that the university should go beyond a focus on compliance and misconduct avoidance, and purposefully lead in the development of high ethical standards for the use of AI in research.**
   Beyond the scope of this committee's work, OVPR should organize and support a campus-wide community of practice and innovation for the responsible and ethical use of AI in research. It is important that this community of practice be supported for a meaningful period of time and include stakeholders who have a range of experiences with and perspectives on AI. The standing AI committee proposed by the Internal Innovations subcommittee could help advise U-M/OVPR in this area.

3. **OVPR and other relevant entities at U-M should ensure that guidelines on the use of AI across the institution - from academics to research to administration - are aligned and congruent.**

Appendix A: Committee Charge

2023 U-M Artificial Intelligence (AI) Research Committee
Charge Document

Statement of Purpose	To advise the Vice President for Research on how best to support U-M's opportunities, performance, and policies regarding AI-related research and research that uses these technologies.
Sponsorship	Rebecca Cunningham, Vice President for Research
Objectives	● Facilitate communication, coordination, and collaboration among committee members regarding AI-related research opportunities. ● Identify current and potential: ○ AI-related and AI-interested researchers and resources at U-M. ○ External funding awards and opportunities in areas that use, or are affected by, new and emerging AI technologies. ○ Partnerships with industry, other universities, and other organizations that can accelerate U-M's pursuit of its AI-related research goals. ○ Guidance on ethical implications and compliance policies. ● Develop recommendations on ways to: (1) increase U-M's competitiveness in AI-related research and research that uses these technologies, (2) expand opportunities for participation in AI-related research at U-M, and (3) develop policies and practices to ensure that U-M research complies with all applicable laws and high ethical standards.
Scope	The committee is expected to conduct information-gathering activities and develop, but not implement, recommendations.
Operations	Three subcommittees on *Resources*, *Competitiveness* and *Ethics* will inform the committee's activities. **The Resources Subcommittee** will compile information regarding current AI-related researchers and research resources at U-M; identify additional AI-interested researchers; and recommend opportunities to develop resources that will help U-M faculty work together more effectively towards higher level goals in this domain. **The Competitiveness Subcommittee** will gather information on the existing AI-related funding awards at U-M; identify current and future external funding opportunities in areas that use, or are affected by, new and emerging AI technologies; and examine existing and potential partnerships with industry, other universities, and other organizations that can accelerate U-M's pursuit of its goals. **The Ethics Subcommittee** will collect information on the ethical implications and compliance policies of AI-related research as well as existing peer (university and industry) policies, and suggest ways to ensure that AI-related research activities at U-M will comply with all applicable laws and ethical standards by offering recommendations on rules and policies related to security, privacy, plagiarism, authenticity, unintended disclosure of confidential information, and other impacts of AI-related research activities.
Timeline	Start date September 1, 2023; ends June 30, 2024. 2023 Current State Report on current state due on December 15, 2023. Recommendations Report due on April 15.

Chair(s)	Arthur Lupia, Chair HV Jagadish (vice chair-competitiveness) Bhramar Mukherjee (vice chair-resources) Jess Peirson (vice chair-ethics)
Committee Members	Jack Bernard, OGC Karthik Duraisamy, COE Gus Evrard, LSA David Hanauer, MICHR H.V. Jagadish, COE Jacqueline Jeruss, OVPR/Med Robert Jones, ITS Bohyun Kim, Library Maggie Levenstein, ISR/SI Arthur Lupia, OVPR/LSA Rada Mihalcea, COE Bhramar Mukherjee, SPH Brad Orr, OVPR/LSA Jess Peirson, OVPR Patricia Petrowski, OGC Lori Pierce, Provost Karandeep Singh, SI/Med Eric Swanson, LSA Akbar Waljee, Med Michael Wellman, COE Ying Xu, SOE
Support	Lindsey Mitchell, OVPR
Data support from participating units to gather and analyze data	MIDAS, MICDE and others as emerge
Stakeholders to engage	U-M AI community. RADS APG Researchers not engaged in AI research but who will need AI tools