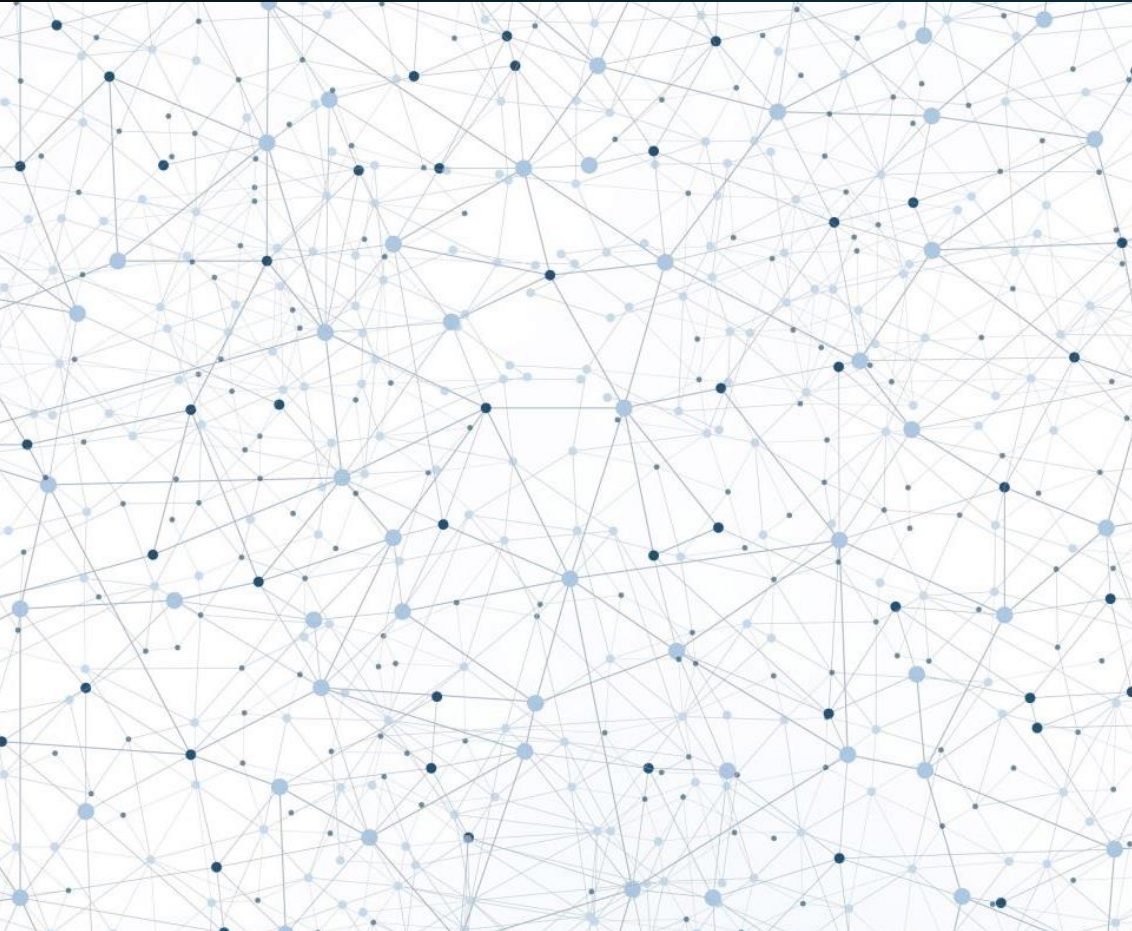


The Role of AI in Research Administration



PART 1 Introduction to Chat-Based AI | Robert Pilgrim

Associate Director, Data Strategy and Insights
Division of Research & Innovation
University of Arkansas

PART 2 Harvard Use Cases | Ashley Bens

Assistant Director of Research Administration Systems and Training
Harvard University School of Engineering and Applied Sciences

Part 3 Machine Learning for Workload Distribution | Dan Harmon

Director Data and Systems
Sponsored Programs Administration
University of Illinois

Federal Demonstration Partnership September 19th-21st 2023¹



PART 1 OF 3

Introduction to Chat-Based AI



Robert Pilgrim Ph.D.

*Associate Director of Data Strategy & Insights
Division of Research & Innovation*

University of Arkansas

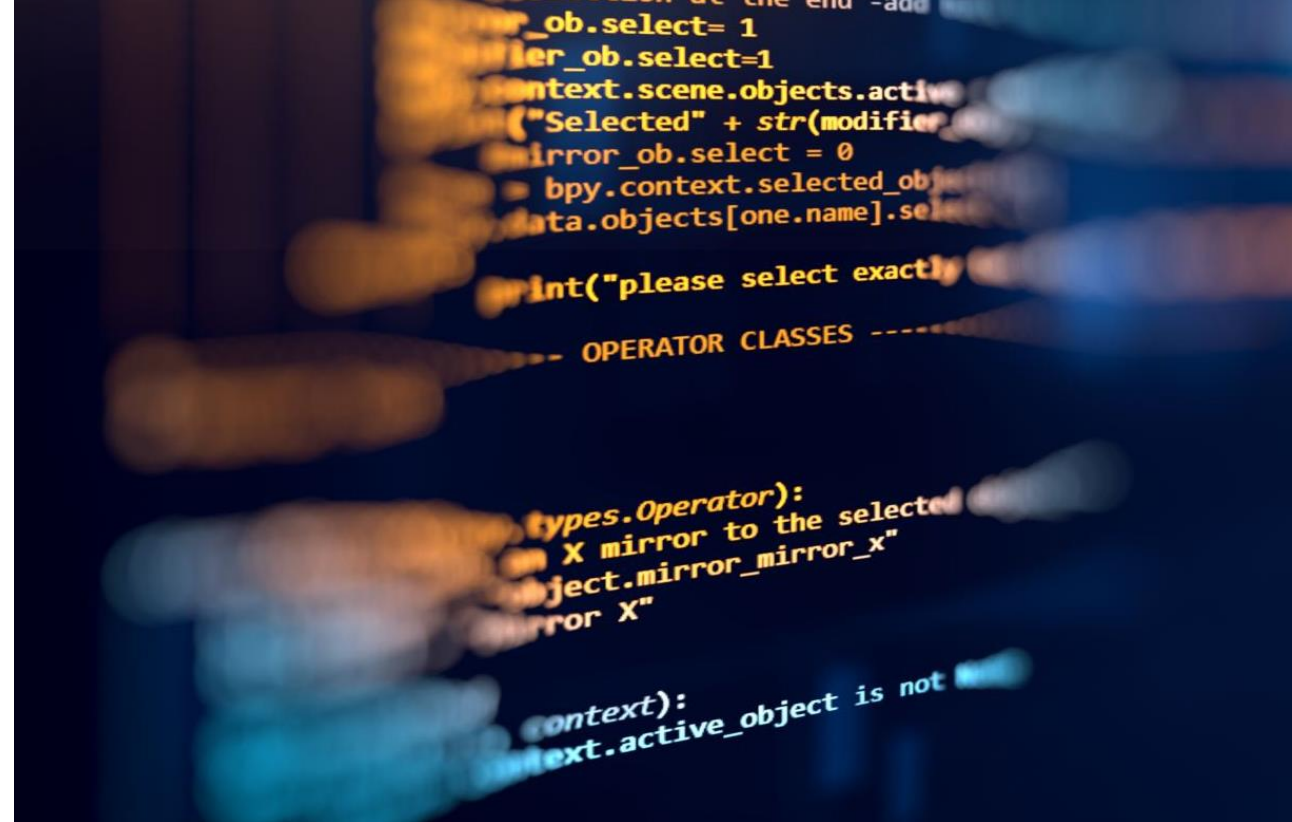
rpilgrim@uark.edu

**GOAL | Be able to use
ChatGPT & Bing Chat**

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the University of Arkansas.

Overview

- The last 12 months in Chat-Based AI
- Examples
 - Simple example
 - Letter of support
 - “Talk” to a PDF
 - Summarize text
 - Proposal outline
- Security
- *I am not an expert, but will share what I know!*



The Last 12 Months



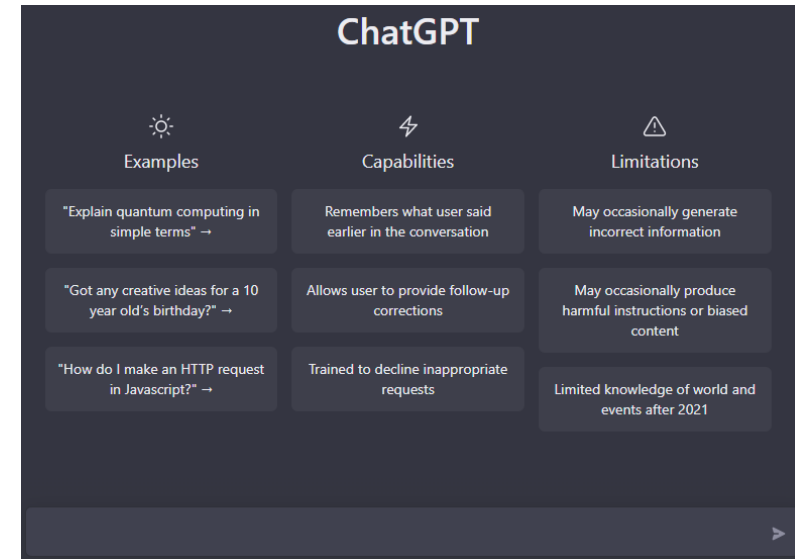
- November 2022 Chat Generative Pre-Trained Transformer (GPT) 3.5 (Free)
- March 2023 GPT 4 released (\$20 per month, 10X the “Power”)
- Why was this significant?
- ***It puts the latest AI technology in the hands of anyone, no coding needed***
 - <https://chat.openai.com/>
 - <https://www.bing.com/search>

Think of AI as your Personal Assistant

- Just like a human assistant you must:
 - Provide data
 - Clearly communicate the task
 - Provide context
 - What do you want
 - What do you NOT want




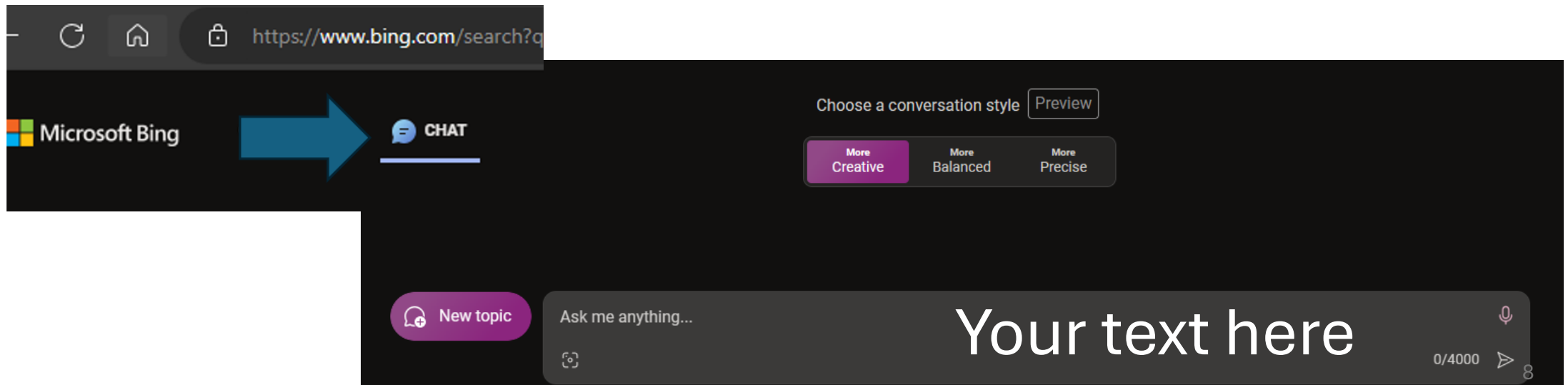
Chat Based AI | 101



I am familiar with Chat GPT, Bing Chat but there are many others emerging.

-1 Chat Based AI | 101

- Use [Bing.com/Search](https://www.bing.com/Search) for this example
- >>  Make me a kid's story outline based on the plot of the movie Hunger Games, but replace the humans with cats and give it a strong cat theme, use cat like names and places. Please use chapter headings





2 AI Generated Letter of Support

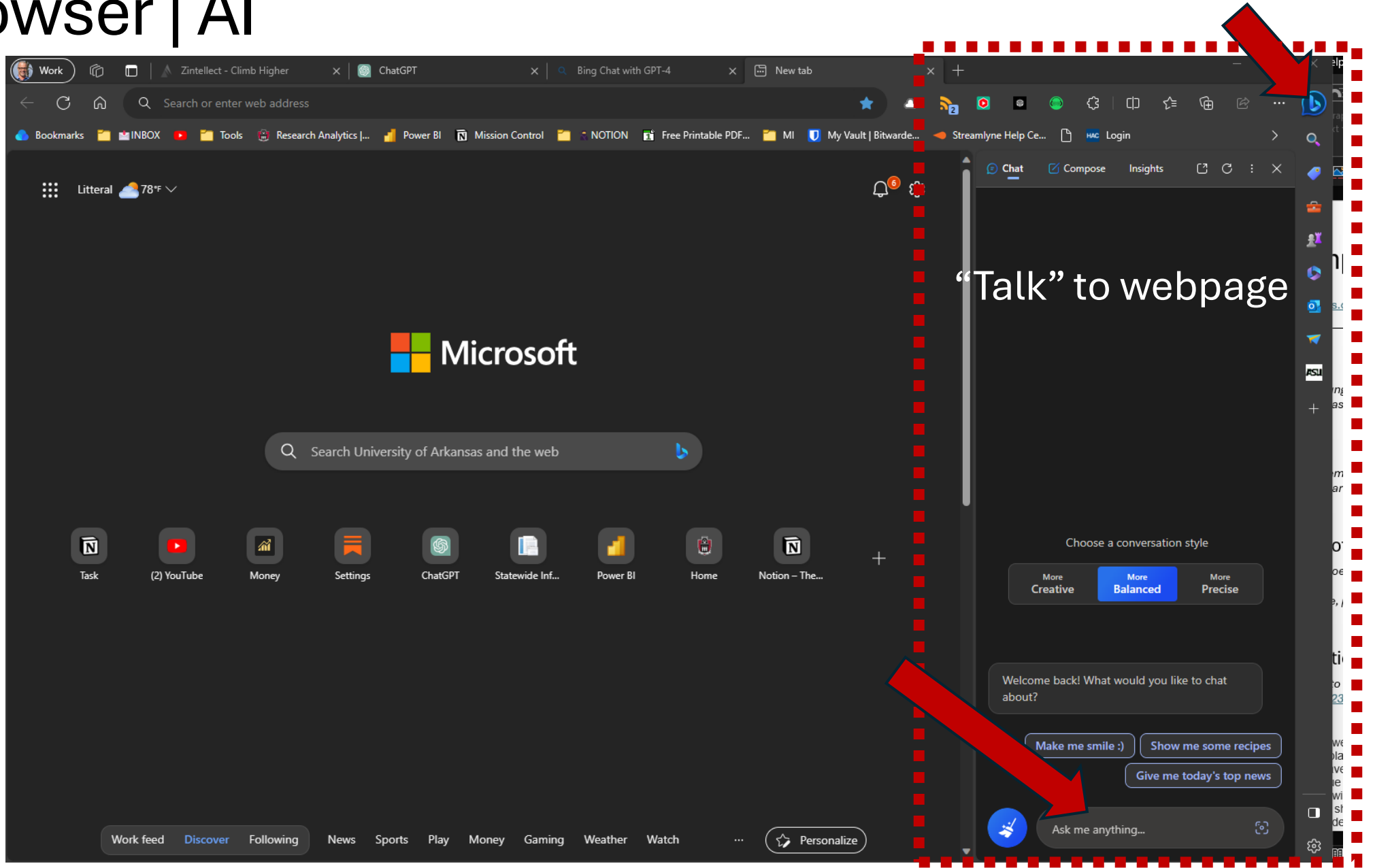


- “You are an expert research development specialist working for a university. Write a **letter of support** for a proposal from a **faculty member in chemical engineering**. The proposal title this letter will support is ***‘Optical probe for Regolith Analysis for Martian Exploration.’*** Leave the university name blank”



“Talking to Documents”

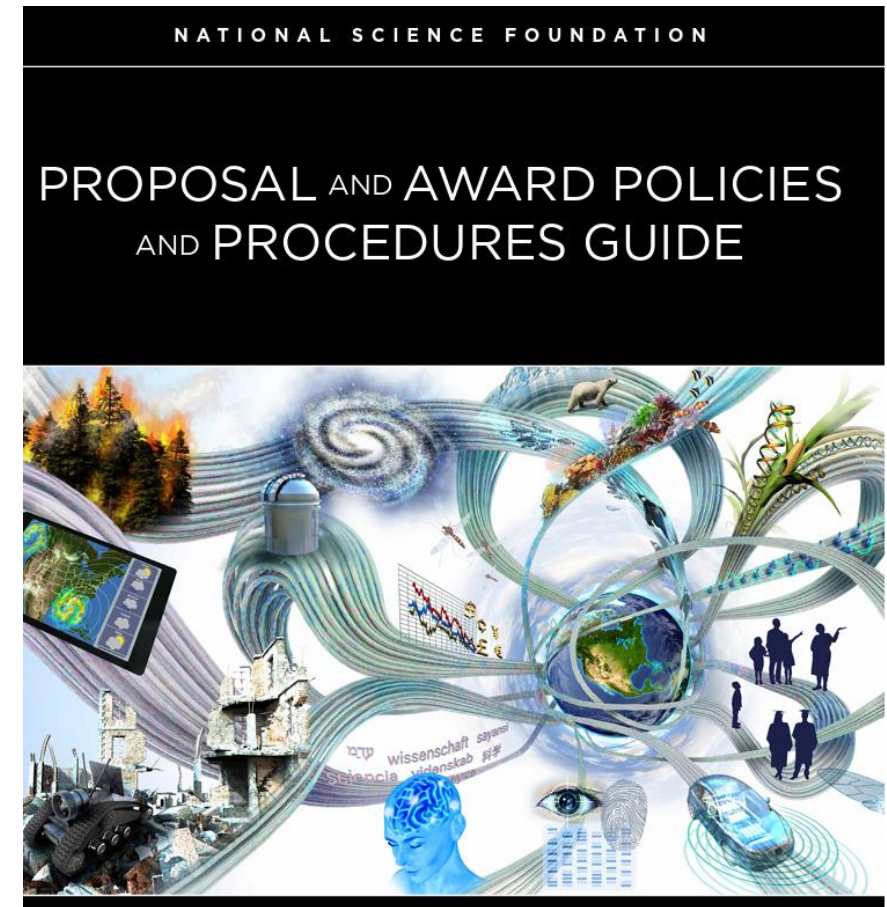
Edge Browser | AI



There may be some setup needed in Edge browser to allow this, to learn more click [here](#)

-3 Example (Edge Browser)

- https://nsf-gov-resources.nsf.gov/2022-10/nsf23_1.pdf
- 200 page PDF
- >> What is a downward adjustment and how do I make one, please only use the page that is opened in the browser.



-4 AI Generated Summarizing a Solicitation

- (Open in Edge Browser, or copy/past text into ChatGPT)
- >> Summarize this webpage, use bullet points.
-

- <https://www.zintellect.com/Opportunity/Details/0211-NPP-NOV23-JPL-PlanetSci>

Mars surface/atmosphere energy exchange modeling; application to regolith properties determination and volatile mapping

National Aeronautics and Space Administration (NASA)

0211-NPP-NOV23-JPL-PlanetSci

11/1/2023 6:00:59 PM Eastern Time Zone


Over the last 5 decades, NASA missions to Mars have returned a wealth of measurements characterizing its surface's thermal state. These datasets, used in conjunction with planetary surface heat transfer algorithms, have been crucially important to certify landing sites or prepare rover traverses by deriving regolith thermophysical properties. Future robotic and human missions to Mars will continue to rely on this type of work. However, new needs are emerging as the potential for in situ resource utilization will become an increasingly important criterion for landing site selection. In particular, demonstrating the presence of shallow ice is going to become necessary in some cases, but proving its absence will also sometimes become desirable (planetary protection).

We seek a candidate who can help us improve numerical tools used to map the presence of shallow ice, and other surface layer attributes from thermal infrared data at selected locations of interest for possible future human exploration; this activity will include upgrading the current atmospheric treatment of an existing well-established planetary regolith model with a state-of-the-art preexisting 1D radiative transfer model in order to refine the heat exchange treatment at the atmosphere/surface interface. Other improvements will involve coupling the subsurface with a full GCM. The resulting improved thermal model will be used to reanalyze temperature datasets at selected sites of interest for upcoming missions to Mars. The results of the research would be disseminated through publications and at domestic and international conferences.

This research opportunity would be most suitable for individuals with experience developing scientific applications with programming languages; willing to manipulate preexisting scientific algorithms; able to work independently; interested in working at the interface between fundamental research and planetary mission work; knowledgeable about atmospheric physics.



Example-Proposal Scaffold

 -5 | You are an expert grant writer, please make me a heading outline of a proposal i want to submit to "The National Academies of Sciences, Engineering, and Medicine " here is the project solicitation text, please just use this text, do not use any other sources:

[COPY PASTE DESCRIPTION HERE]

Mars surface/atmosphere energy exchange modeling; application to regolith properties determination and volatile mapping

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0211-NPP-NOV23-JPL-PlanetSci

Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone



Description

Over the last 5 decades, NASA missions to Mars have returned a wealth of measurements characterizing its surface's thermal state. These datasets, used in conjunction with planetary surface heat transfer algorithms, have been crucially important to certify landing sites or prepare rover traverses by deriving regolith thermophysical properties. Future robotic and human missions to Mars will continue to rely on this type of work. However, new needs are emerging as the potential for in situ resource utilization will become an increasingly important criterion for landing site selection. In particular, demonstrating the presence of shallow ice is going to become necessary in some cases, but proving its absence will also sometimes become desirable (planetary protection).

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Proposal Outline for Enhancing Numerical Tools to Map Shallow Ice and Surface Layer Attributes on Mars

I. Executive Summary

- Brief overview of the project
- Objectives and anticipated outcomes
- Relevance to NASA's mission and goals

II. Introduction

A. Background

- Historical context of Mars missions
- Importance of regolith thermophysics
- Emerging needs for in situ resource utilization

B. Problem Statement

- Limitations of current numerical tools
- Necessity for improved atmospheric models

C. Objectives

- To upgrade existing planetary regolith models
- To refine heat exchange treatments
- To couple the subsurface with a full GCM

III. Literature Review

- Existing planetary surface heat transfer algorithms
- Current state-of-the-art 1D radiative transfer models
- General Circulation Models in planetary science

IV. Methodology

A. Data Sources

- Thermal infrared data at selected locations
- Temperature datasets for reanalysis

B. Tools and Technologies

- Programming languages to be used
- Preexisting scientific algorithms for manipulation

C. Procedures

- Steps for upgrading the current atmospheric treatment
- Methodology for coupling the subsurface with a full GCM

V. Project Timeline

- Preliminary research and data collection
- Model development and upgrades
- Data reanalysis
- Validation and testing
- Dissemination of results

VI. Budget and Resources

- Detailed budget breakdown
- Required software and hardware
- Personnel and expertise

VII. Expected Outcomes

- Improved numerical tools
- Refined heat exchange models
- Reanalyzed temperature profiles

IX. Conclusion

- Summary of the project's significance
- Anticipated contributions to Mars exploration and planetary science

X. Appendices

- Supplementary data
- Preliminary results
- References


XI. Acknowledgments

- Funding sources
- Collaborators and advisors

XII. References

- List of cited literature and relevant works

Text Improvement

- [bunce_nsf_proposal_2011_rejected.pdf \(wordpress.com\)](#)
 - This is a real proposal
-  - 6 | *Please suggest changes to this text, show me the original, the new, and tell me why you are making these suggestions, put this into a table*

INTRODUCTION

Overview

This 25-month investigation examines the relationship between inter-ethnic interactions, perceptions, and the cultural content of ethnic groups. Evidence from ethnography, psychological experiments, and evolutionary models supports the intuition that inter-ethnic interactions among individuals play an important role in the changing “cultural content” of an ethnic group, i.e., the norms (beliefs about what is acceptable behavior) and the symbolic markers (dress, language, etc.) perceived to be shared by co-ethnics. However, the mechanisms underlying this relationship remain poorly understood. This study asks the question: **How do patterns of interaction among people of different ethnicities relate to the actual and perceived distributions of ethnic-typical norms of behavior and symbolic markers across an ethnic boundary?** This question is addressed in two ways. First, ethnographic and experimental methods are used to explore correlations among these variables in the field. Second, agent-based models are developed to explore causal mechanisms underlying the observed patterns. The study population consists of the minority indigenous Matsigenka ethnic group and the majority Mestizo ethnic group in lowland forests along the Manu River in southeastern Peru. Although still limited, Matsigenka-Mestizo interaction has increased steadily in the Manu region in recent years, spurring political debate about how such interaction leads to change in “traditional” Matsigenka norms of behavior (e.g., Terborgh 1999). This study aims to produce new insight into the roles of inter-ethnic interactions, markers, and out-group perceptions in cultural change across an ethnic boundary.

Theoretical Background

Definitions and Relationships among Terms

An **ethnic group** is here defined as a social group to which individuals ascribe themselves and to which they are ascribed by others, based on a perception of shared ancestry and, usually, a range of subjectively important shared norms (beliefs about what is appropriate behavior) and symbolic markers (language, dress, etc.) (adapted from: Barth 1998[1969]; Gil-White 1999; Weber 1968). A **boundary** between two ethnicities is usually characterized by a sharp division of perceived ancestry, norms, and markers between individuals identifying with different ethnic groups. People who can credibly claim membership in more than one ethnic group tend to choose to identify with only one at a time (Alba 1990; Nagel 1996; Waters 1990), or to create a new separate ethnicity (Nagata 1981), thereby preserving boundaries.

Boundaries between ethnicities can be maintained despite the fact that the norms and markers of ethnic groups may change over time. In particular, norms held by individuals of two frequently-interacting ethnic groups may evolve to become similar in the contexts of interaction, as shared norms tend to make coordinated interactions more mutually beneficial (Barth 1998[1969]; McElreath et al. 2003). For example, shared beliefs about what constitutes “fairness” make exchanges more efficient. **Norms** are broadly defined as beliefs about what is appropriate behavior, and encompass the personal, descriptive, and social norms of Bicchieri (2006). Norms can have important behavioral consequences (Schultz et al. 2007), and much inter-ethnic behavioral variation in a given context is here assumed to result from the application of different norms. Such norm differences may often result from inter-ethnic differences in

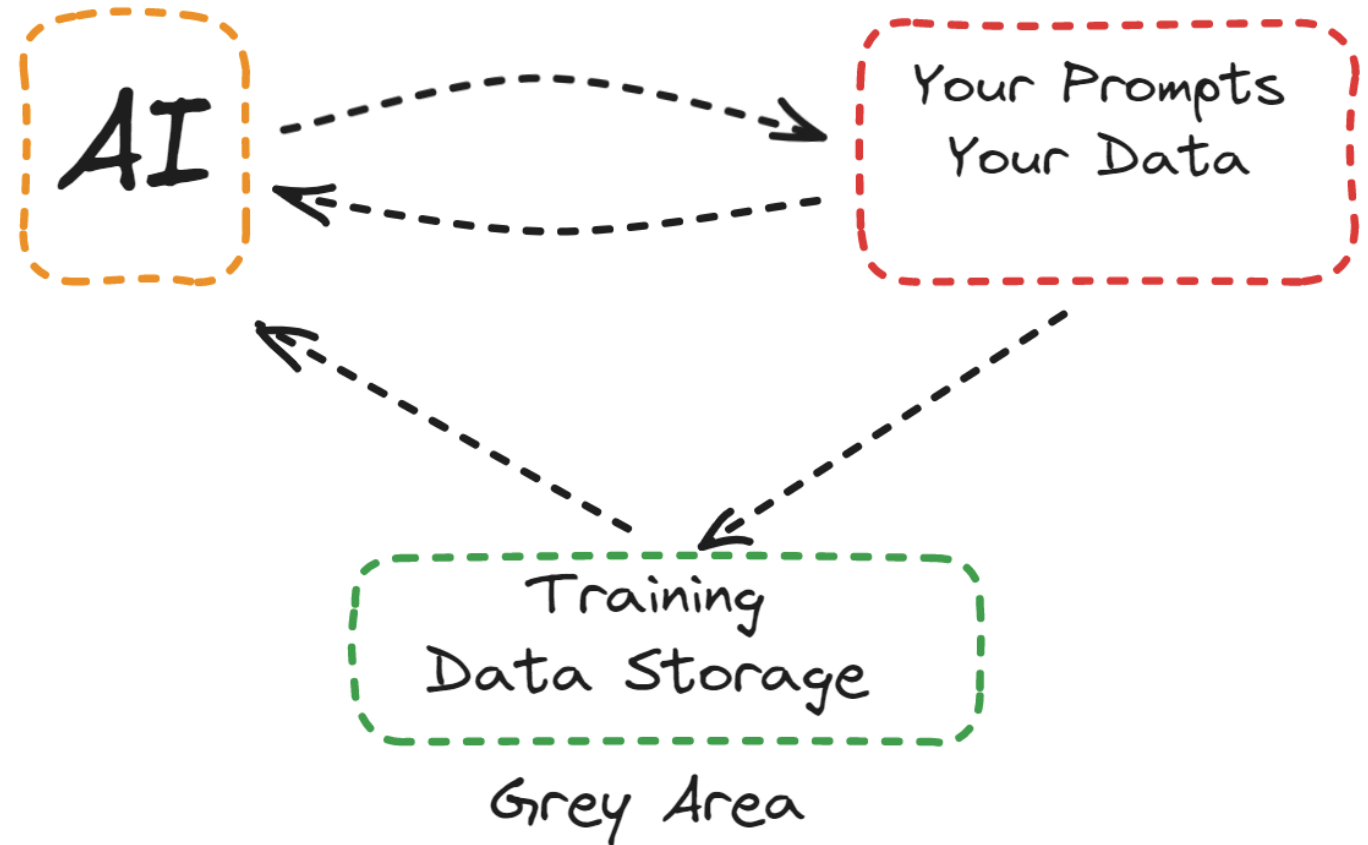
Security



I want to use AI but I am worried about my data

I am Concerned about my Data

- Always check the system you are using
- Does it take your data and prompts and use it for training?
- Does it store your data for 30 days and then delete (still potential for hacks)



Secure Data | Bing Chat *Enterprise*

- All institutions with a “**A5 for Faculty License**” will get access by default in October
- 100% secure
- Data is ***not*** retained
- Learn [more](#)

Microsoft Bing SEARCH CHAT Protected

Bing Chat Enterprise AI-powered copilot for the web Preview

Bing is powered by AI, so surprises and mistakes are possible. Please share feedback so we can improve! [Terms](#) | [Privacy](#)

Ads are not targeted based on your workplace identity or chat history. [Learn more.](#)

Choose a conversation style

More Creative More Balanced More Precise

Analyze
Create a SWOT analysis about environmental goals and impact

Write
Help me prepare and write a successful sales pitch

Compare
Compare online and offline marketing strategies

Business Travel
What's a good place to stay for my upcoming business trip to New York?

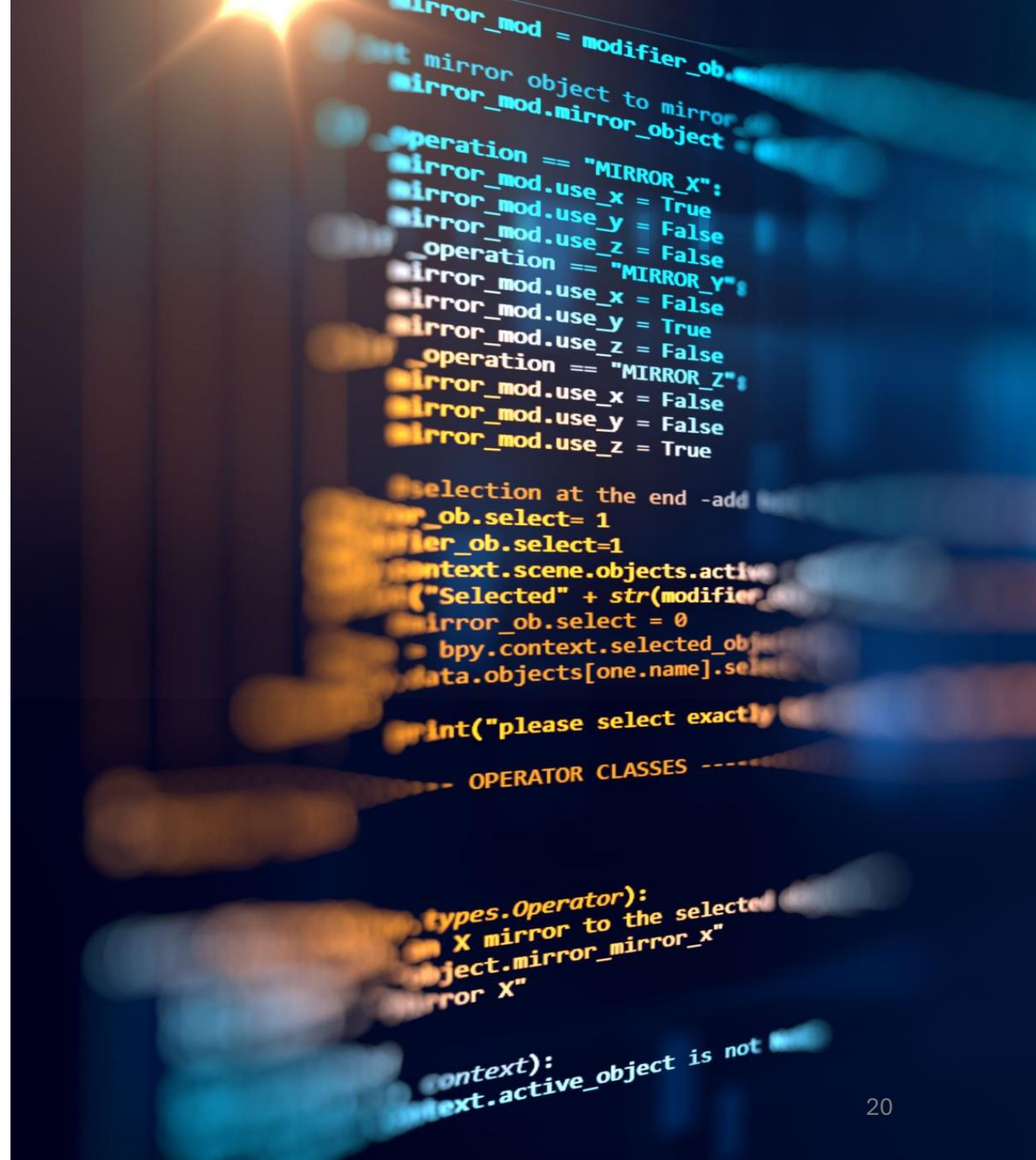
Your personal and company data are protected in this chat

New topic Ask me anything... 0/4000

Review

- The last 12 months in Chat Based AI
- How can I use AI right now
- Examples
 - Simple example
 - Letter of Support
 - “Talk” to a PDF
 - Summarize Text
 - Proposal Outline
- Security

Additional slides: AI impact on US workforce. Text to image.
Microsoft A5 License.



Speak nicely to AI, it may one day be your boss!



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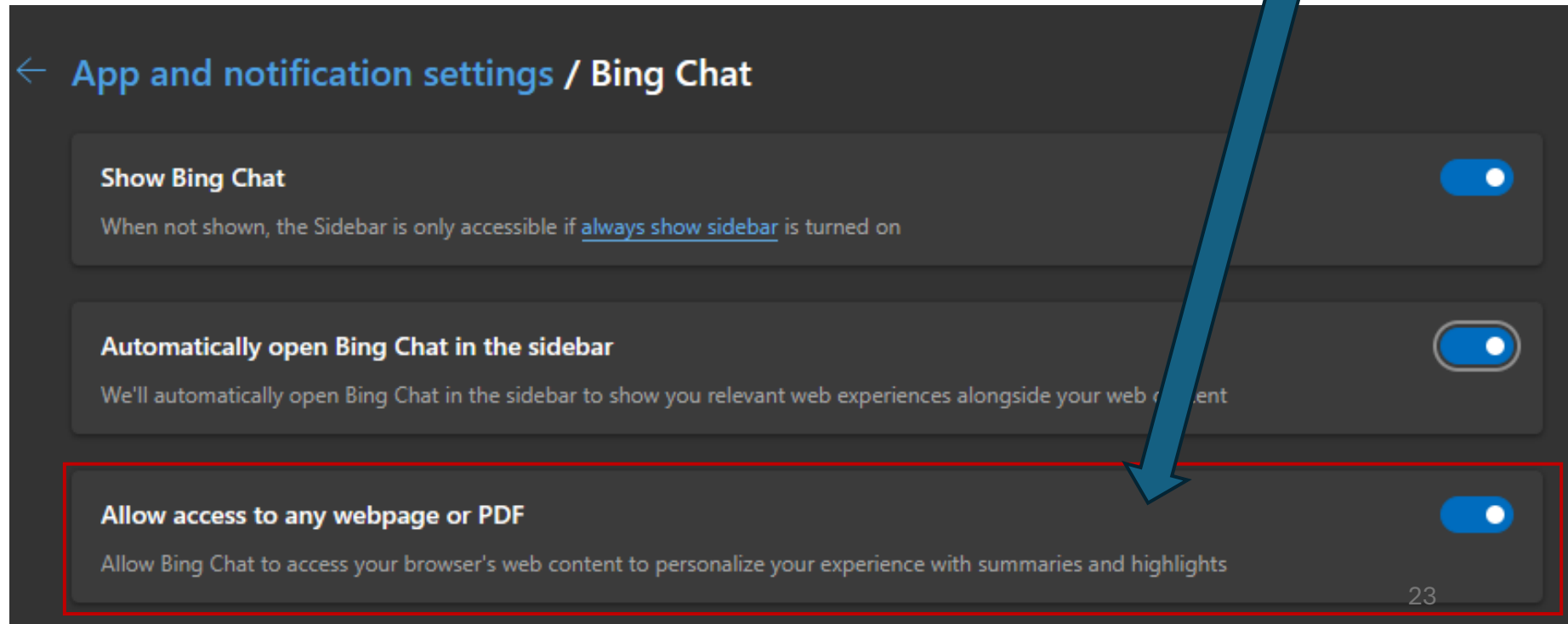
Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the University of Arkansas.

Extra Slides

Microsoft Edge Browser AI Setup

- Open Microsoft Edge Browser
- Click the big blue “Bing Icon”
- Allow “Access to webpage or PDF”

[<<Go Back](#)



Bing Chat Enterprise | The Details

- All institutions with a “***A5 for Faculty License***” will soon get access by default
- 100% secure, data is never used
- **Data deleted after use**

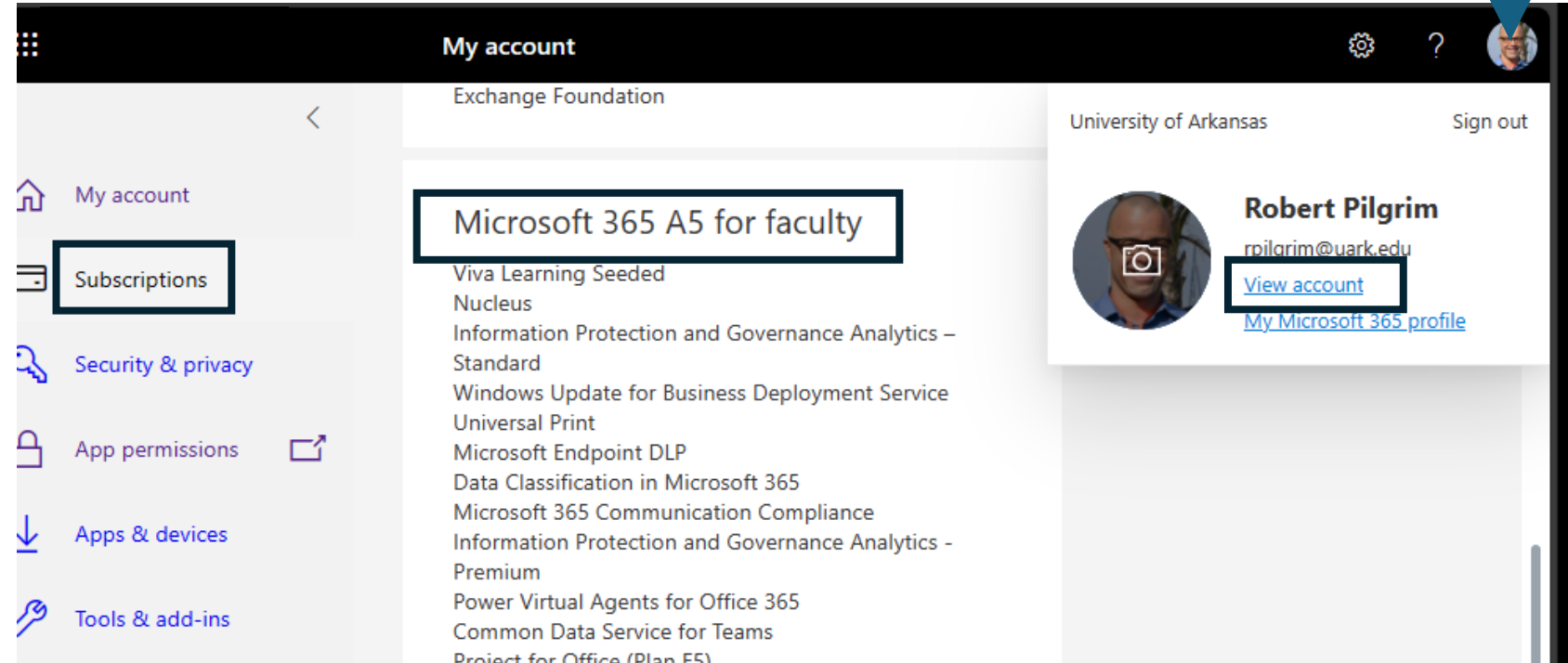


Image Generation with Midjourney.com

- Text to image AI
- Wide angled selfie surfboarding in space with a spacesuit
- Realistic, drawing, girl
- A female worker sat opposite an AI robot , both on a laptop
- Black and white closeup of a young women
- Spiderman as a pig
- Karate Cat



Spiderman as a Pig



AI Impact on the US Workforce



Impact of AI on US Workforce in the Next 5 Years

WORKING PAPER

GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models

Tyna Eloundou¹, Sam Manning^{1,2}, Pamela Mishkin*¹, and Daniel Rock³

¹OpenAI

²OpenResearch

³University of Pennsylvania

March 27, 2023



<https://www.visualcapitalist.com/cp/which-jobs-artificial-intelligence-gpt-impact/>

Impact of AI on US Workforce in the Next 5 Years



High exposure means 50% or more of that job will be done, or aided by AI

<https://www.visualcapitalist.com/cp/which-jobs-artificial-intelligence-gpt-impact/>

Impact of AI on US Workforce in the Next 5 Years



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OpenAI's Recommendation for Government Focus



Prepare for
economic
disruption



Reform education
policy



Reform worker
training policy



Reform safety
net programs

GPTs are GPTs: An Early Look at the Labor Market Impact
Potential of Large Language Models

Final Thoughts | Rate of Change is Exponential



Not Leveraging AI

12 Months Ago



Leveraging AI (Now)
Dial-Up Internet!

Today



Leveraging AI
Fiber-optic internet speed

Near Future

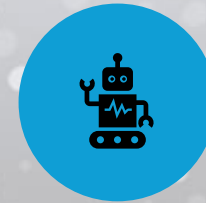
Can AI Increase the Yield on Proposals



How might AI contribute to enhancing proposal quality?



Can AI-driven analytics identify trends in successful proposals?



What data should be used to train AI for proposal enhancement?



How do we ensure that the human touch remains in AI-assisted proposals?



What are the risks and how might they be mitigated?