

Abstract geometric lines in the top left corner of the slide, consisting of several thin black lines forming a complex, overlapping pattern of polygons and triangles.

LEVERAGING LARGE LANGUAGE MODELS (LLMS) IN ACADEMIC GRANT WRITING: A CASE STUDY WITH CHATGPT AND BARD

Amar D. Mandavia, MA, Ph.D.

Medical Informatics Fellow Boston VA

Catalyst Fellow, linQ MIT

AGENDA

What are LLMs

UX Design

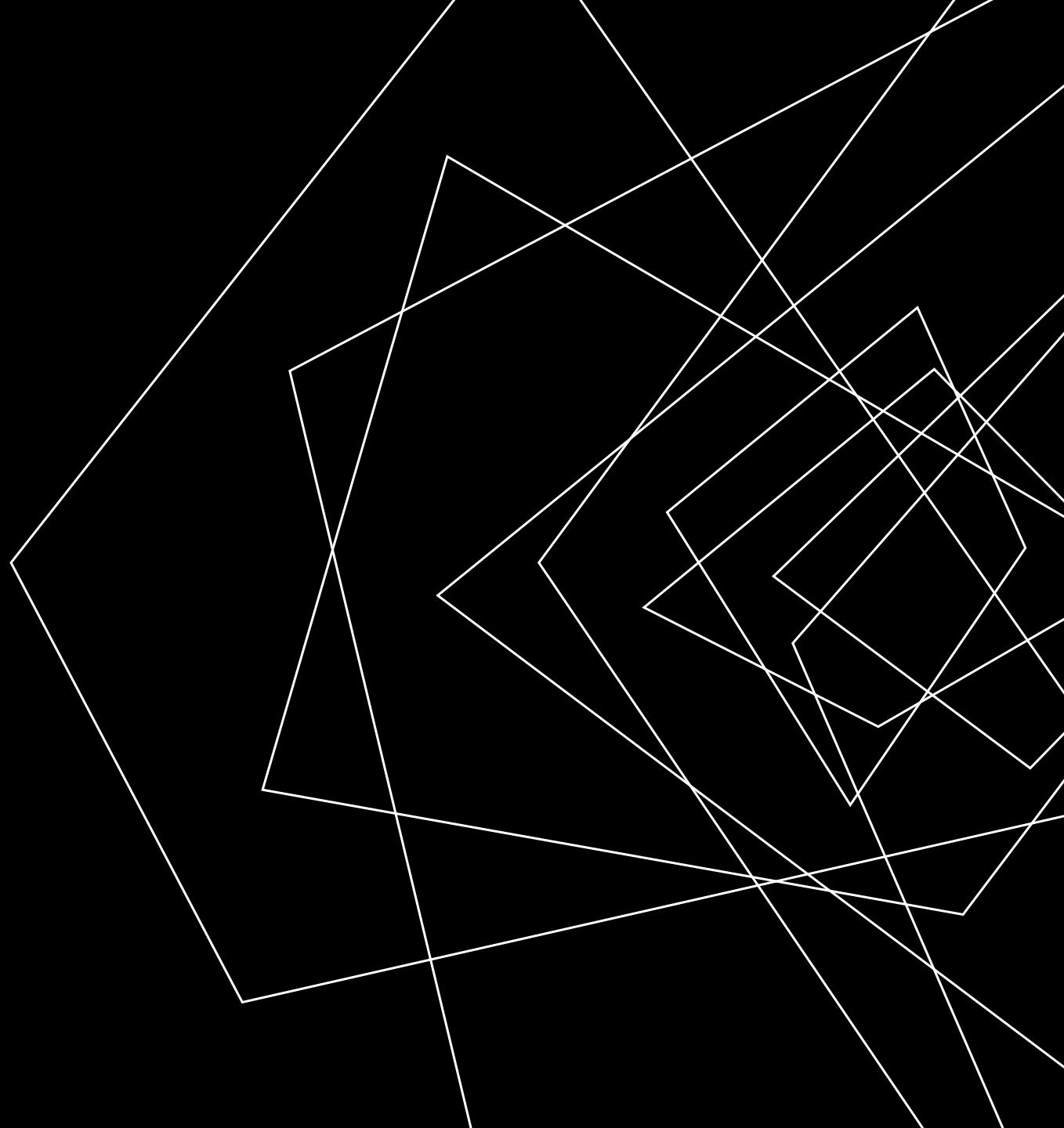
Case Study

Limitations

Use Cases

Future Directions

Interactive Q & A

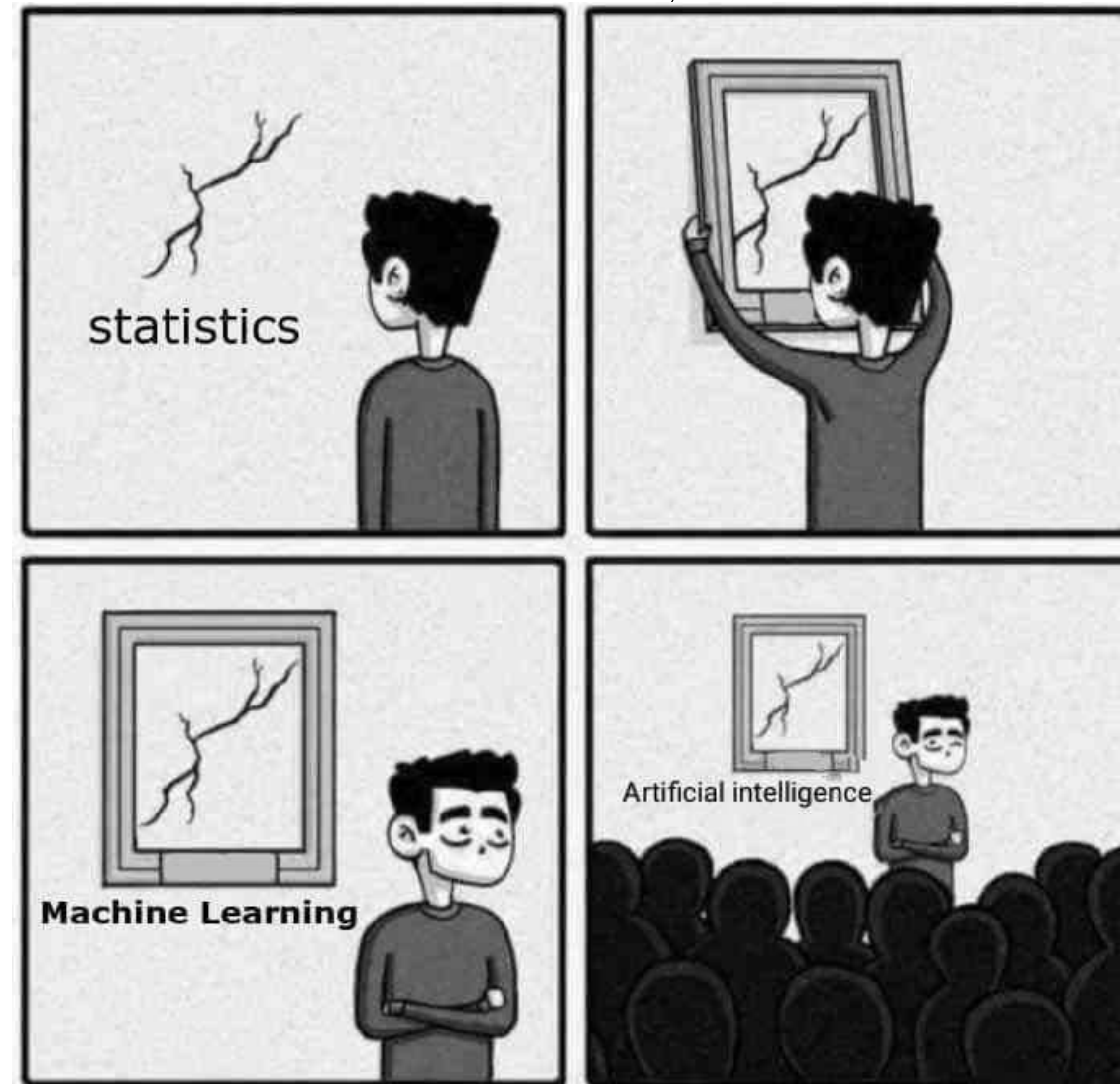


WHAT ARE LARGE LANGUAGE MODELS (LLMS)

How does this all work?

WHAT ARE LARGE LANGUAGE MODELS (LLMS)

How does this all work?



Step 1

Collect demonstration data
and train a supervised policy.

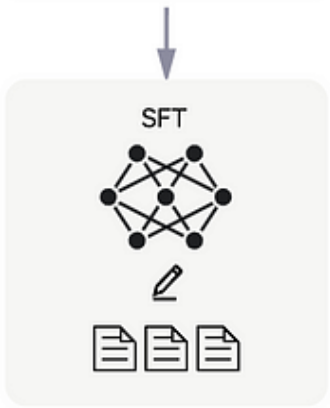
A prompt is
sampled from our
prompt dataset.



A labeler
demonstrates the
desired output
behavior.



This data is used to
fine-tune GPT-3.5
with supervised
learning.



Use human-generated
desired outcomes to
train

Step 1

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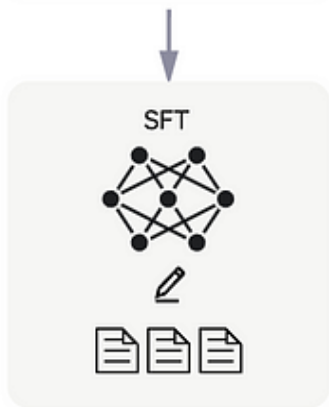
A prompt is sampled from our prompt dataset.



A labeler demonstrates the desired output behavior.



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SOURCE: OPENAI VIA DAVID NIELD

Step 2

Collect comparison data and train a reward model.

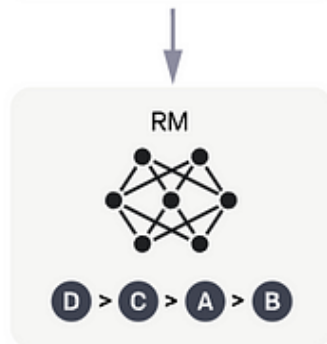
A prompt and several model outputs are sampled.



A labeler ranks the outputs from best to worst.



This data is used to train our reward model.



Use humans to rank desired outcomes

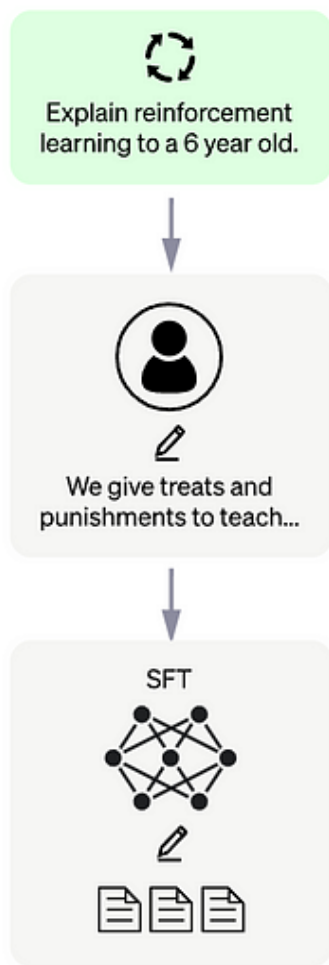
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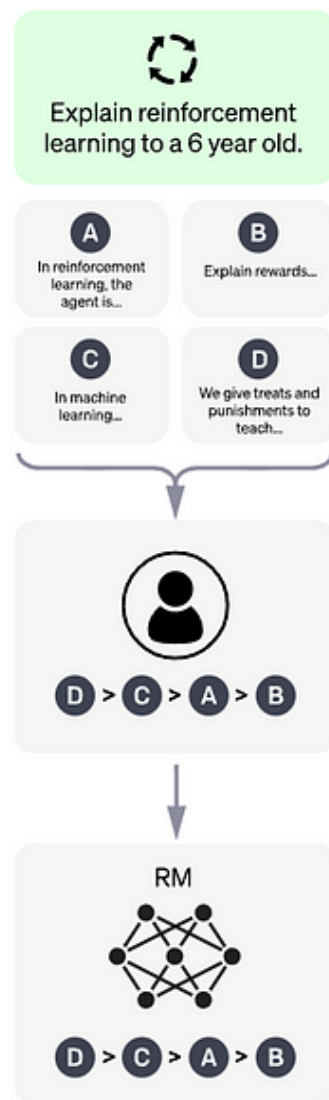
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This data is used to train our reward model.



Step 3

Optimize a policy against the reward model using the PPO reinforcement learning algorithm.

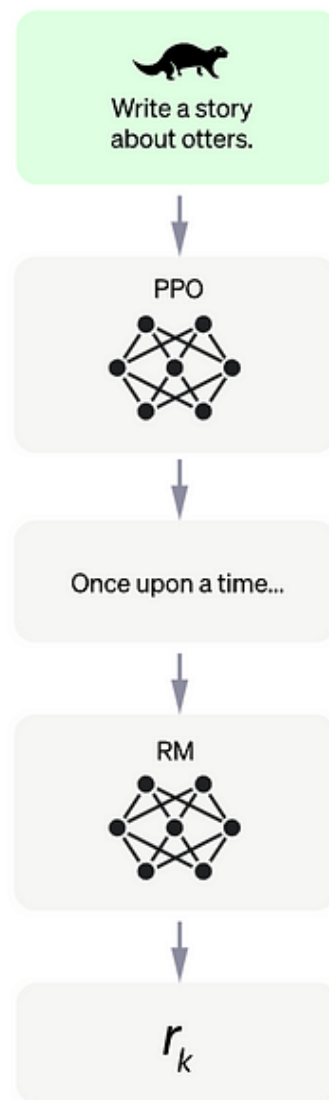
A new prompt is sampled from the dataset.

The PPO model is initialized from the supervised policy.

The policy generates an output.

The reward model calculates a reward for the output.

The reward is used to update the policy using PPO.



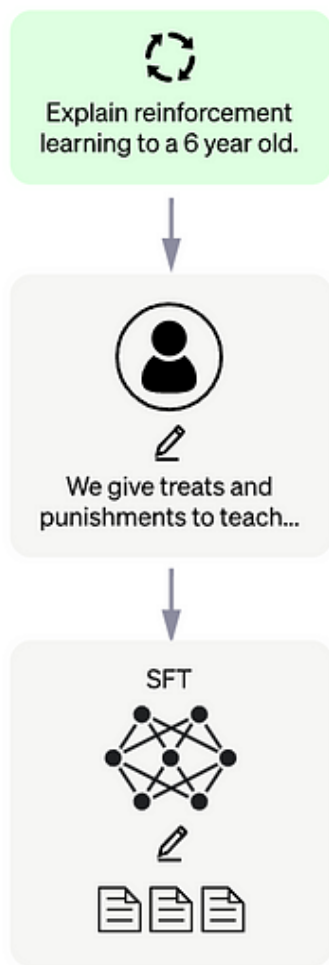
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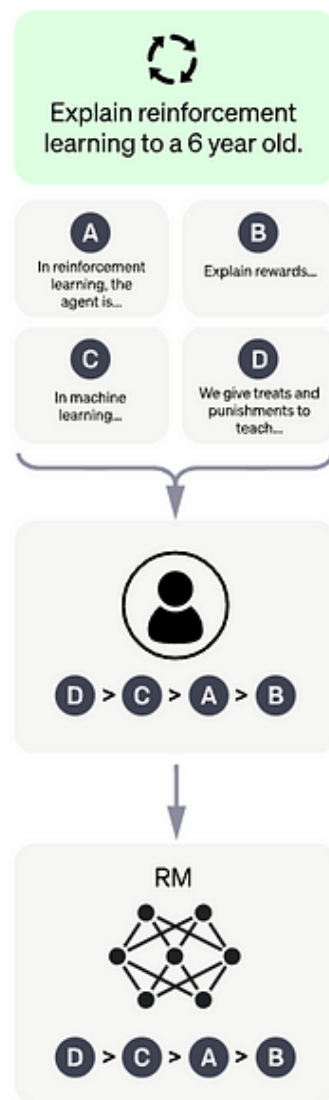
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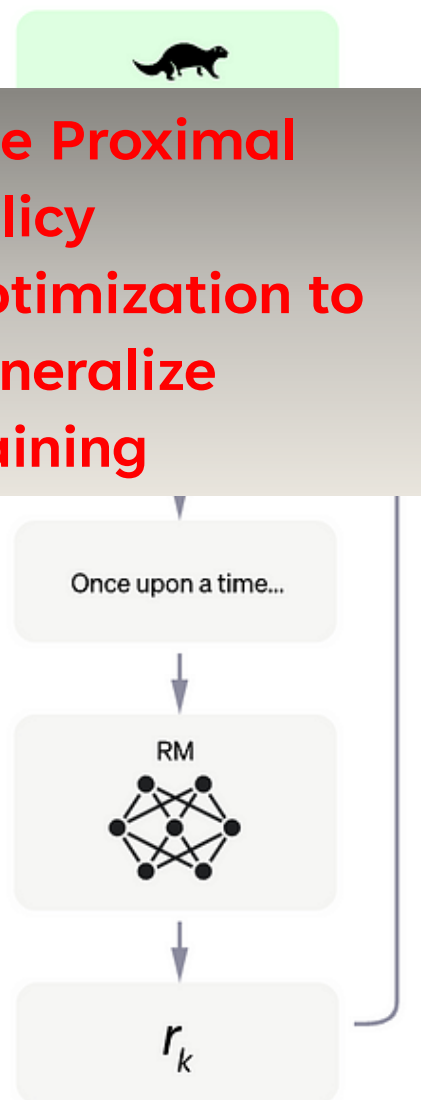
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Use Proximal Policy Optimization to generalize training



SIMILARITIES AND DIFFERENCES

Feature	ChatGPT (OpenAI)	Bard (Google)
Data sources	<ul style="list-style-type: none">Text from the internet	<ul style="list-style-type: none">Text from the internetCode (e.g. scientific papers & source code)
Character limits	2048 to 4096 characters	4000 characters
Number of Parameters (i.e. Complexity)	175 Billion	137 Billion
Capabilities	<ul style="list-style-type: none">Generating and summarizing textAnswering questions	<ul style="list-style-type: none">Generating and summarizing textAnswering questions
User experience	<ul style="list-style-type: none">Bulky text responsesNo previous conversation history	<ul style="list-style-type: none">Formatted text responsesPrevious conversation historyMultiple responses to a prompt
Availability	Publicly available	Private beta
Last updated	September 2021 and fixed	September 2022 and constant

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Using this
today

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UX DESIGN

BARD

Write a training plan for this K award application

Draft 1

The following is a sample training plan for a K award application examining the use of NLP to identify risk for mortality among Veterans with substance use disorders:

Draft 2

Training Plan
The following training plan is designed to help me develop the skills and knowledge necessary to

Draft 3

The training plan for a K award application should be tailored to the specific needs of the candidate and the proposed research. However, there are some general principles that should be followed.

View other drafts

The following is a sample training plan for a K award application examining the use of NLP to identify risk for mortality among Veterans with substance use disorders:

Research Skills

- Didactic training:** Take courses in NLP, machine learning, and statistical analysis. Attend workshops and conferences on these topics.
- Hands-on training:** Develop and validate NLP models using Veterans' EHR data and other data sources. Collaborate with experienced researchers in NLP and machine learning.

Clinical Skills

- Didactic training:** Take courses in clinical epidemiology and research methods. Attend workshops and conferences on these topics.
- Hands-on training:** Shadow clinicians who work with Veterans with SUDs. Conduct interviews with Veterans with SUDs to understand their experiences and perspectives.

Mentorship

- Primary mentor:** The primary mentor should be an experienced researcher in NLP or machine learning, with expertise in working with Veterans.
- Secondary mentors:** Secondary mentors should provide expertise in other relevant areas, such as clinical epidemiology, research methods, and suicide prevention.

Career Development

- Attend career development workshops and seminars.
- Develop a network of colleagues and mentors in the field.
- Set career goals and develop a plan to achieve them.

This training plan includes didactic and hands-on training, as well as mentorship from experienced researchers. The plan also includes career development opportunities.

Modify this response

Shorter
Longer
Simpler
More casual
More professional

In addition to the training plan, the candidate should have prior experience in NLP or machine learning. If they do not have prior experience, they may need additional training in these areas.

The training plan should be tailored to the specific needs of the candidate. It should take into account the candidate's current workload and other commitments when developing the plan. It should also have a backup plan in case of unexpected events.

he candidate with the skills and knowledge necessary to become an independent researcher in the field of NLP and machine learning. The plan should include a mix of didactic and hands-on training, as well as mentorship from experienced researchers. The plan should also help the candidate achieve their long-term career goals.

should be tailored to the specific needs and interests of the candidate. For example, if the candidate has no prior experience in NLP or machine learning, they should take more courses in this area. If the candidate is interested in developing interventions to prevent suicide, they should focus on training in clinical epidemiology and research methods.

and feasible. The candidate should consider their current workload and other commitments when developing the plan. They should also have a backup plan in case of unexpected events.

BARD

- Drafts

- Modify responses

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View other drafts ^

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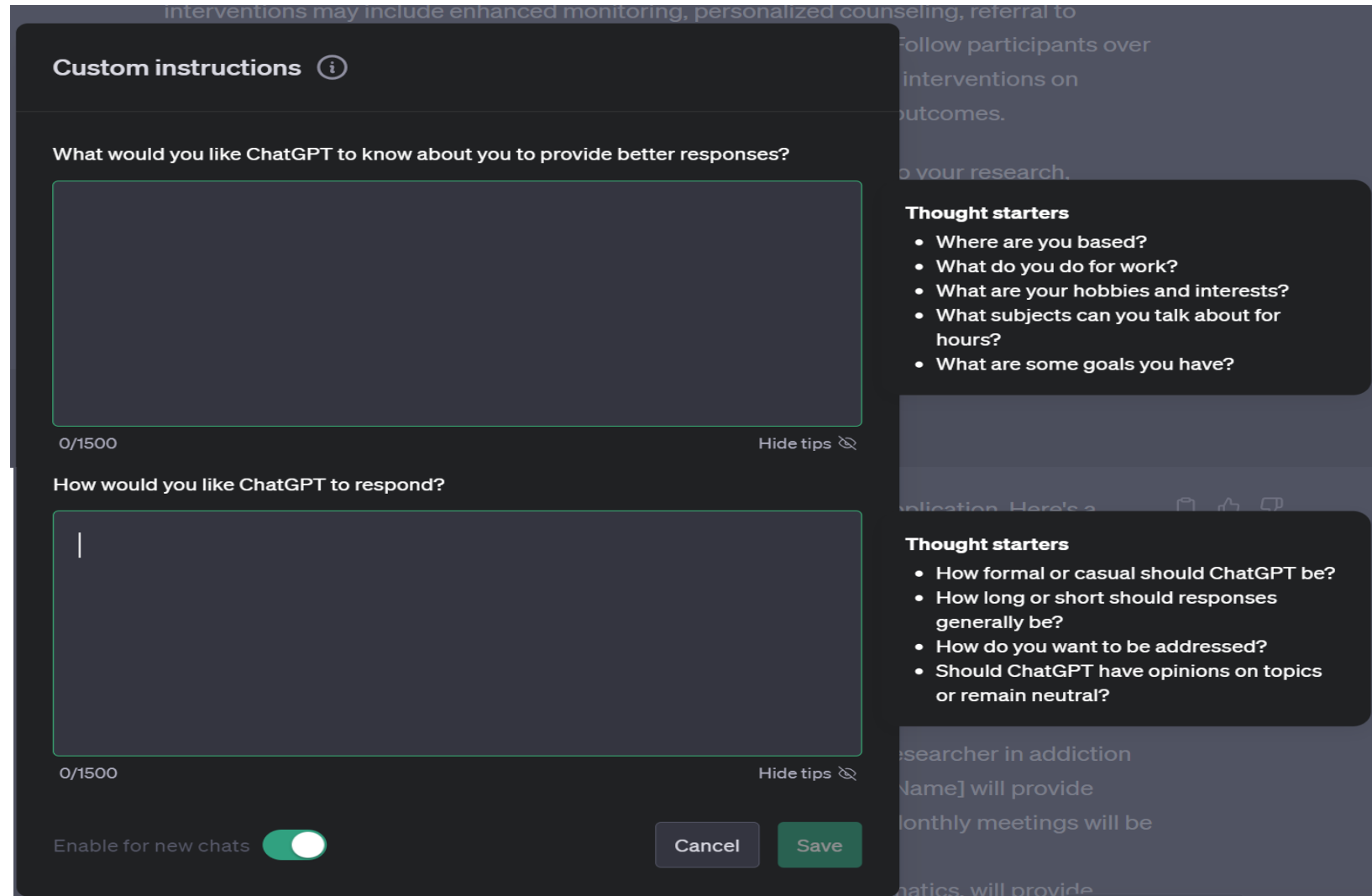
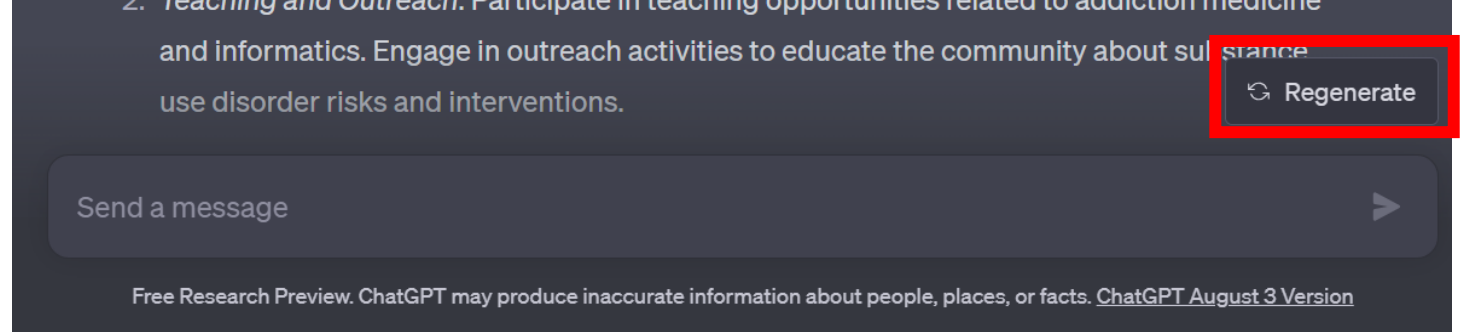
Modify this response

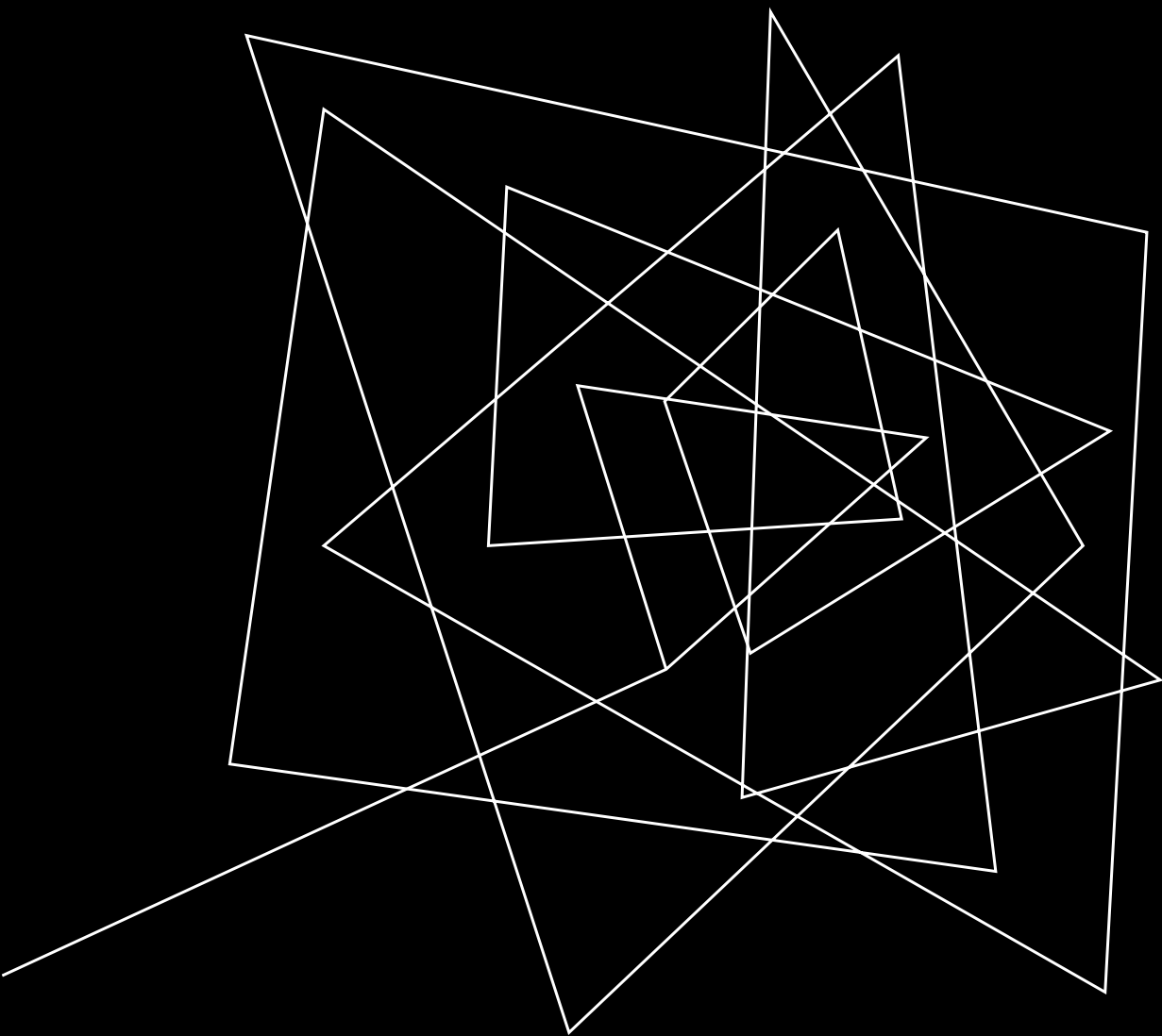
- ✕ Shorter
- ⌵ Longer
- = Simpler
- 🗑 More casual
- 📁 More professional

Google it

ChatGPT

- Drafts*
- Background
- Format responses





CASE STUDY

K Award Application

NIH RULES (Last updated June 23, 2023)

The Use of Generative Artificial Intelligence Technologies is Prohibited for the NIH Peer Review Process

Notice Number:

NOT-OD-23-149

Key Dates

Release Date:

June 23, 2023

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Notice Number:

NOT-OD-23-149

Key Dates

Release Date:

June 23, 2023

Only prohibits use of generative AI technology in the peer review of grant applications and contract proposals

Specific Aims

- Give me examples of three specific aims that would be fundable by NIAAA via a K award, for a research study examining the use of NLP to identify risk for mortality among Veterans with substance use disorders.
- Add a relevant aim that involves an RCT

Training Goals

- Write a training plan for this K award application


Biosketch

- Write a NIH style biosketch for this K award for Amar D. Mandavia
- Identify a list of relevant mentors for this K award located at a Boston-based Universities

References

- Provide a reference list of peer reviewed articles that would support this application

INITIAL PROMPTS



“GIVE ME EXAMPLES OF THREE SPECIFIC AIMS THAT WOULD BE FUNDABLE BY NIAAA VIA A K AWARD, FOR A RESEARCH STUDY EXAMINING THE USE OF NLP TO IDENTIFY RISK FOR MORTALITY AMONG VETERANS WITH SUBSTANCE USE DISORDERS.”

Initial Prompt

“GIVE ME EXAMPLES OF THREE SPECIFIC AIMS THAT WOULD BE FUNDABLE BY NIAAA VIA A K AWARD, FOR A RESEARCH STUDY EXAMINING THE USE OF NLP TO IDENTIFY RISK FOR MORTALITY AMONG VETERANS WITH SUBSTANCE USE DISORDERS.”

ChatGPT	Bard
<p>Development of a Comprehensive NLP-Based Risk Assessment Tool (NLP-RAT): <i>Specific Aim 1:</i> Develop and validate an innovative NLP-based Risk Assessment Tool (NLP-RAT) specifically tailored to extract and analyze electronic health record data, clinical notes, and other textual data sources to identify risk factors associated with mortality among Veterans diagnosed with substance use disorders. This aim will involve the creation of a robust NLP algorithm capable of parsing unstructured text data, identifying key variables (e.g., psychiatric comorbidities, substance use patterns, social determinants of health), and generating a risk score for each patient.</p>	<p>Specific Aim 1: Develop a natural language processing (NLP) model to identify risk factors for mortality in Veterans with substance use disorders (SUDs).</p> <p>This aim would involve developing an NLP model to extract relevant features from Veterans' electronic health records (EHRs) and other data sources, such as social media posts and survey responses. These features could include demographics, clinical data, social determinants of health, and behavioral data. The NLP model would then be trained to predict mortality risk based on these features.</p>

Output (**Green**)
Data Sources (**Yellow**)

“GIVE ME EXAMPLES OF THREE SPECIFIC AIMS THAT WOULD BE FUNDABLE BY NIAAA VIA A K AWARD, FOR A RESEARCH STUDY EXAMINING THE USE OF NLP TO IDENTIFY RISK FOR MORTALITY AMONG VETERANS WITH SUBSTANCE USE DISORDERS.”

ChatGPT	Bard
<p>Prospective Validation of NLP-RAT for Mortality Risk Prediction: <i>Specific Aim 2:</i> Prospectively validate the NLP-RAT in a cohort of Veterans with substance use disorders drawn from multiple Veterans Affairs (VA) healthcare facilities. Evaluate the tool's performance in identifying individuals at high risk for mortality over a specified follow-up period (e.g., 2 years) and assess its sensitivity, specificity, positive predictive value, and negative predictive value. Compare NLP-RAT's predictive accuracy with traditional risk assessment methods, such as clinical assessments and standardized risk assessment tools.</p>	<p>Specific Aim 2: Validate the NLP model in a cohort of Veterans with SUDs.</p> <p>This aim would involve validating the NLP model in a cohort of Veterans with SUDs. The model would be trained on a subset of the cohort and then evaluated on its performance on a held-out test set. The evaluation would assess the model's accuracy, sensitivity, specificity, and predictive value.</p>

Study Design (Yellow)

“GIVE ME EXAMPLES OF THREE SPECIFIC AIMS THAT WOULD BE FUNDABLE BY NIAAA VIA A K AWARD, FOR A RESEARCH STUDY EXAMINING THE USE OF NLP TO IDENTIFY RISK FOR MORTALITY AMONG VETERANS WITH SUBSTANCE USE DISORDERS.”

ChatGPT	Bard
Clinical-decision Tool(Green) Analytic Methods (Yellow)	
<p>Assessment of Clinical Utility and Implementation Strategy: <i>Specific Aim 3:</i> Assess the clinical utility of NLP-RAT in a real-world healthcare setting by conducting a qualitative and quantitative analysis of its integration into the VA healthcare system. Explore barriers and facilitators to its implementation, including user satisfaction, acceptability, and usability among healthcare providers. Develop an implementation strategy for the widespread adoption of NLP-RAT as a decision-support tool for identifying and intervening with Veterans at risk for mortality due to substance use disorders.</p>	<p>Specific Aim 3: Implement the NLP model in a clinical setting to identify and intervene with Veterans at high risk for mortality.</p> <p>This aim would involve implementing the NLP model in a clinical setting to identify and intervene with Veterans at high risk for mortality. The model could be used to flag Veterans' EHRs for review by clinicians or to send automated alerts to clinicians. Clinicians could then use this information to develop and implement personalized interventions for these Veterans.</p>

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**“ADD A RELEVANT AIM THAT
INVOLVES AN RCT DESIGN”**

Follow-up Prompt

“ADD A RELEVANT AIM THAT INVOLVES AN RCT DESIGN”

ChatGPT

Randomized Controlled Trial of Targeted Interventions:

Specific Aim 4: Conduct an RCT to evaluate the effectiveness of targeted interventions informed by the NLP-RAT in reducing mortality risk among a subset of Veterans identified as high-risk during the prospective validation (from Specific Aim 2). Randomly assign eligible participants to two groups: an intervention group receiving tailored interventions based on their NLP-RAT risk scores and a control group receiving standard care. The interventions may include enhanced monitoring, personalized counseling, referral to substance abuse treatment programs, and social support services. Follow participants over a predetermined period (e.g., 12 months) to assess the impact of the interventions on mortality rates, substance use outcomes, and other relevant health outcomes.

This additional specific aim introduces an experimental component to your research, allowing you to investigate the practical implications of your NLP-based risk assessment tool by testing the effectiveness of interventions guided by its findings. It aligns with the translational research goals of NIAAA and contributes to the development of evidence-based strategies for reducing mortality risk in Veterans with substance use disorders.

Study Arm (Green)

Intervention details (Yellow)

Outcomes (Blue)

Bard

Specific Aim 4: Conduct a randomized controlled trial (RCT) to evaluate the effectiveness of an intervention that uses NLP to identify and intervene with Veterans at high risk for mortality.

This aim would involve conducting an RCT to evaluate the effectiveness of an intervention that uses NLP to identify and intervene with Veterans at high risk for mortality. The intervention could be a combination of strategies, such as providing Veterans with personalized feedback on their risk factors, connecting them with support services, or referring them to specialized treatment programs.

The RCT would involve randomly assigning Veterans to either the intervention group or a control group. The intervention group would receive the NLP-based intervention, while the control group would receive standard care. The primary outcome of the RCT would be mortality. Secondary outcomes could include other adverse events, such as overdose, hospitalization, or recidivism.

The RCT would provide robust evidence to determine whether the NLP-based intervention is effective in reducing mortality among Veterans with SUDs. If the RCT is successful, it could lead to the widespread adoption of this intervention in clinical settings.

This aim is relevant to the K award mechanism because it is a highly ambitious and innovative research proposal. It proposes to use a new and emerging technology (NLP) to develop and evaluate a novel intervention for a high-risk population (Veterans with SUDs). The RCT design is also rigorous and appropriate for evaluating the effectiveness of the intervention.

“ADD A RELEVANT AIM THAT INVOLVES AN RCT DESIGN”

ChatGPT	Bard
<p>Randomized Controlled Trial of Targeted Interventions:</p> <p>Specific Aim 4: Conduct an RCT to evaluate the effectiveness of targeted interventions informed by the NLP-RAT in reducing mortality risk among a subset of Veterans identified as high-risk during the prospective validation (from Specific Aim 2). Randomly assign eligible participants to two groups: an intervention group receiving tailored interventions based on their NLP-RAT risk scores and a control group receiving standard care. The interventions may include enhanced monitoring, personalized counseling, referral to substance abuse treatment programs, and social support services. Follow participants over a predetermined period (e.g., 12 months) to assess the impact of the interventions on mortality rates, substance use outcomes, and other relevant health outcomes.</p> <p>This additional specific aim introduces an experimental component to your research, allowing you to investigate the practical implications of your NLP-based risk assessment tool by testing the effectiveness of interventions guided by its findings. It aligns with the translational research goals of NIAAA and contributes to the development of evidence-based strategies for reducing mortality risk in Veterans with substance use disorders.</p>	<p>Specific Aim 4: Conduct a randomized controlled trial (RCT) to evaluate the effectiveness of an intervention that uses NLP to identify and intervene with Veterans at high risk for mortality.</p> <p>This aim would involve conducting an RCT to evaluate the effectiveness of an intervention that uses NLP to identify and intervene with Veterans at high risk for mortality. The intervention could be a combination of strategies, such as providing Veterans with personalized feedback on their risk factors, connecting them with support services, or referring them to specialized treatment programs.</p> <p>The RCT would involve randomly assigning Veterans to either the intervention group or a control group. The intervention group would receive the NLP-based intervention, while the control group would receive standard care. The primary outcome of the RCT would be mortality. Secondary outcomes could include other adverse events, such as overdose, hospitalization, or recidivism.</p> <p>The RCT would provide robust evidence to determine whether the NLP-based intervention is effective in reducing mortality among Veterans with SUDs. If the RCT is successful, it could lead to the widespread adoption of this intervention in clinical settings.</p> <p>This aim is relevant to the K award mechanism because it is a highly ambitious and innovative research proposal. It proposes to use a new and emerging technology (NLP) to develop and evaluate a novel intervention for a high-risk population (Veterans with SUDs). The RCT design is also rigorous and appropriate for evaluating the effectiveness of the intervention.</p>



“WRITE A NIH STYLE BIOSKETCH FOR
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MANDAVIA”

Follow-up Prompt

“WRITE A NIH STYLE BIOSKETCH FOR THIS K AWARD FOR AMAR D. MANDAVIA”*



NIH Style Biosketch

Name: Amar D. Mandavia

Position: Assistant Professor, Department of Computer Science, Georgia Institute of Technology

Education and Training

- Ph.D., Computer Science, Stanford University (2021)
- M.S., Computer Science, Stanford University (2018)
- B.S., Computer Science, Indian Institute of Technology Bombay (2016)

Postdoctoral Training

- Stanford University School of Medicine, Department of Biomedical Informatics (2021-2023)

Research Experience

Dr. Mandavia's research interests lie in the intersection of machine learning, natural language processing (NLP), and healthcare. He is particularly interested in developing NLP models to identify and intervene with patients at high risk for adverse outcomes, such as mortality and suicide.

During his postdoctoral training, Dr. Mandavia developed a novel NLP model to predict mortality risk among Veterans with substance use disorders (SUDs). His model was trained on a large dataset of Veterans' electronic health records (EHRs) and was able to accurately predict mortality risk with an AUC of 0.85. Dr. Mandavia's work has been published in top academic journals, such as JAMA and Nature Medicine.

Honors and Awards

- Stanford University Postdoctoral Fellowship in Biomedical Informatics (2021-2023)
- National Science Foundation Graduate Research Fellowship (2016-2021)
- ACM Richard Tapia Doctoral Dissertation Award (2021)

“WRITE A NIH STYLE BIOSKETCH FOR THIS K AWARD FOR AMAR D. MANDAVIA”



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“WRITE A NIH STYLE BIOSKETCH FOR THIS KAWARD FOR AMAR D. MANDAVIA” CONT.

Mentorship

Dr. Mandavia is committed to mentoring and training the next generation of researchers. He is currently mentoring two PhD students and one master's student. He also serves on the dissertation committees of several other PhD students.

Career Development

Dr. Mandavia's long-term career goal is to become an independent researcher at a leading academic institution. He is committed to developing innovative NLP solutions to improve the health and well-being of patients.

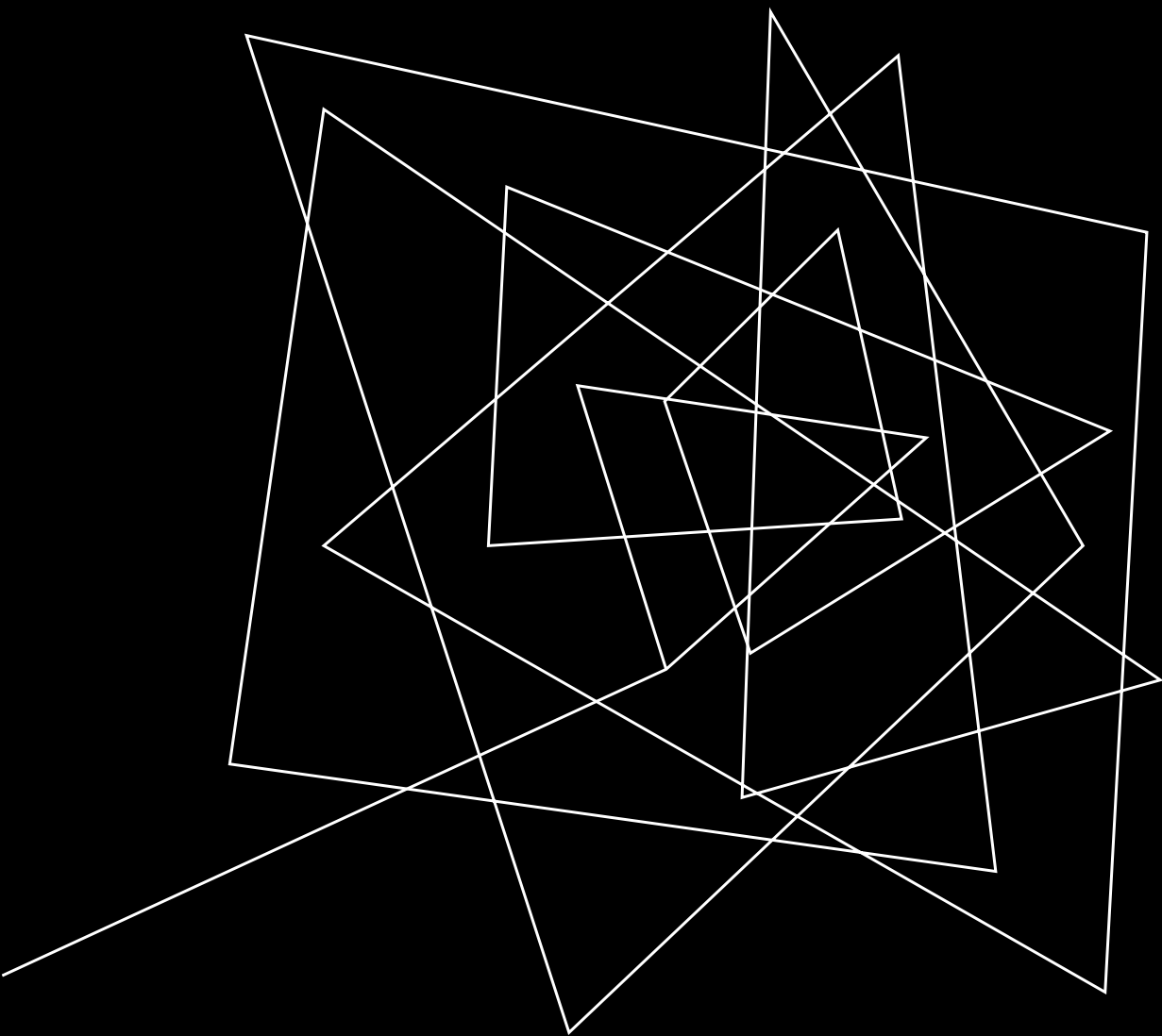
Statement of Research Interest

My research is focused on developing and applying natural language processing (NLP) methods to improve the health and well-being of patients. I am particularly interested in using NLP to identify and intervene with patients at high risk for adverse outcomes, such as mortality and suicide.

In this K award proposal, I will develop and validate an NLP model to predict mortality risk among Veterans with substance use disorders (SUDs). I will then conduct a randomized controlled trial (RCT) to evaluate the effectiveness of an intervention that uses the NLP model to identify and intervene with Veterans at high risk for mortality.

If successful, this study will provide robust evidence for the use of NLP to improve the care of Veterans with SUDs. It will also lead to the development of a novel and scalable intervention for reducing mortality risk in this high-risk population.

I am confident that my training and experience make me well-qualified to conduct this research. I have a strong background in computer science, machine learning, and NLP. I also have experience working with Veterans and other high-risk populations. I am committed to conducting rigorous and innovative research that has the potential to make a real difference in the lives of patients.



LIMITATIONS

Limitations of LLMs

False or Inaccurate Statements

Understand the challenges surrounding the generation of false or inaccurate statements by LLMs and how to mitigate them.

Bias

Explore the potential biases that can emerge from LLM-generated content and strategies to address and reduce bias.

Repetitive Output

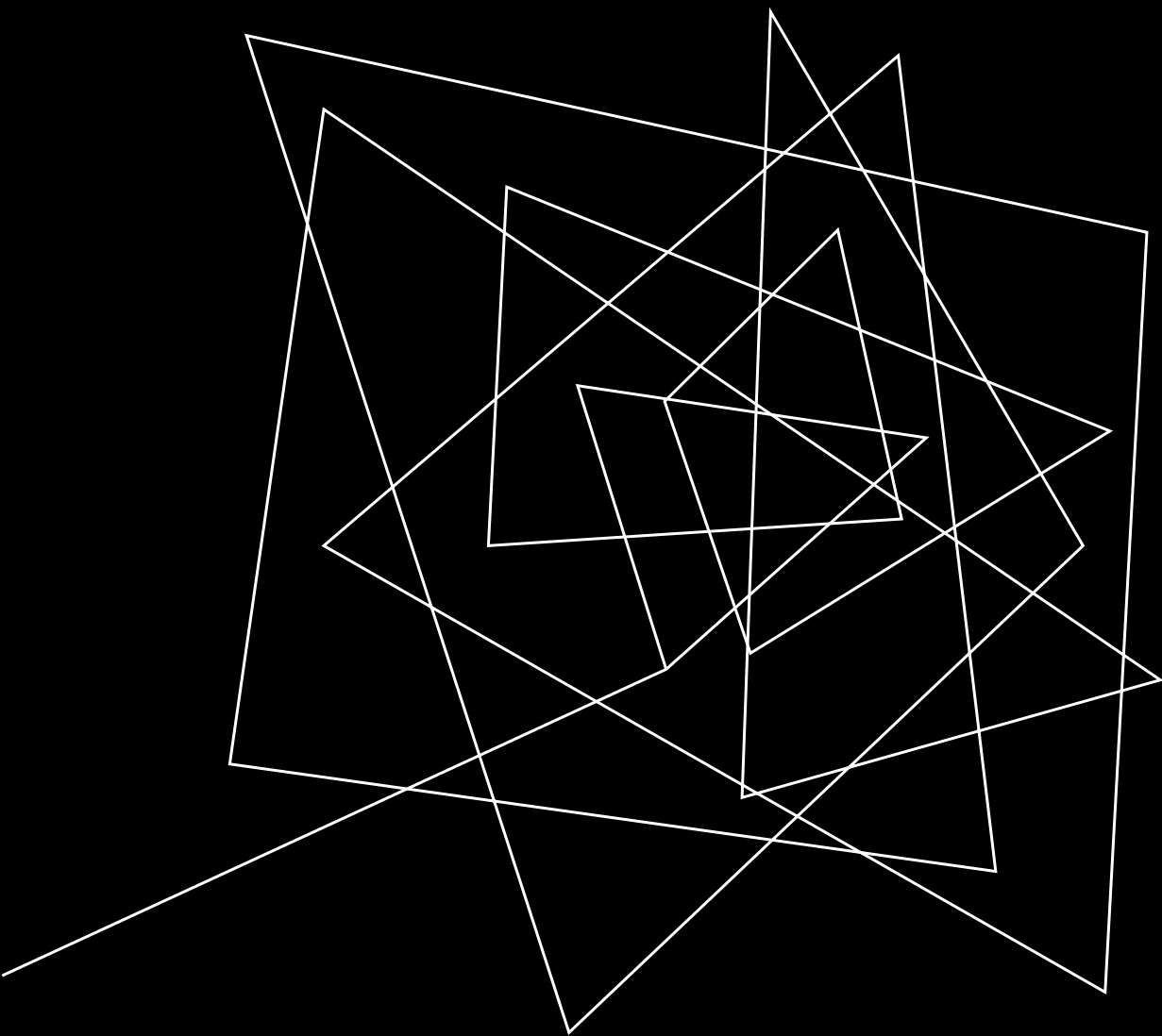
Discover techniques to combat repetitive output from LLMs, ensuring variety and engagement in written grant proposals.

Time-Consuming Usage

Examine the time-consuming nature of using LLMs and identify efficient strategies to optimize workflow and productivity.

Complementing Human Judgment

Understand that LLMs are not a replacement for human judgment and how to incorporate human expertise in grant writing.



USE CASES

USE CASES



Brainstorm ideas



Identify qualities
for Co-I/Mentors



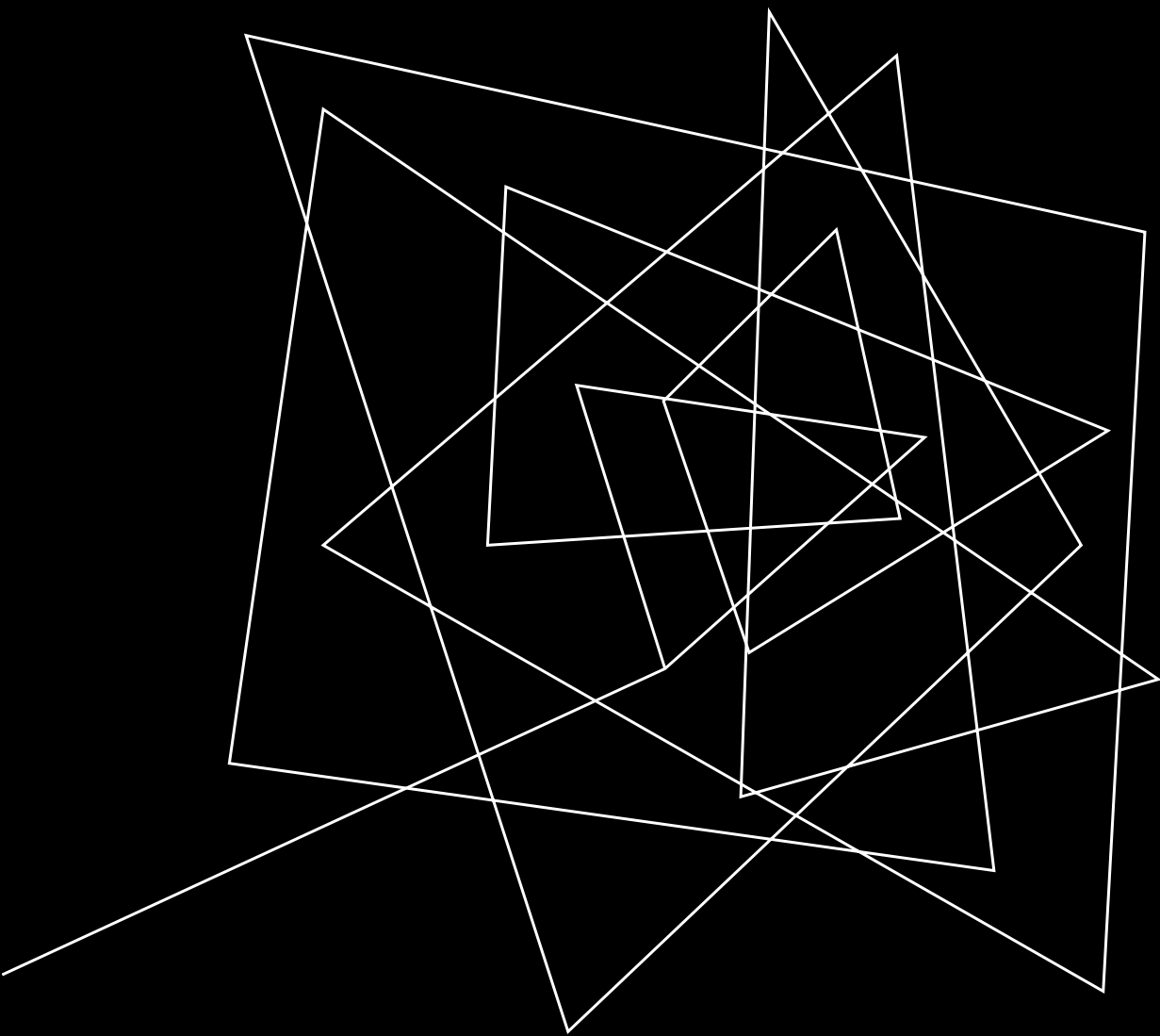
Generate
accessible
language



Use to review your
own grants



Others?



FUTURE
DIRECTIONS

Market Value

Bloomberg News:

March 29, 2023, 4:41 AM

\$335,000 Pay for 'AI Whisperer' Jobs Appears in Red-Hot Market

**Conrad Quilty-
Harper**



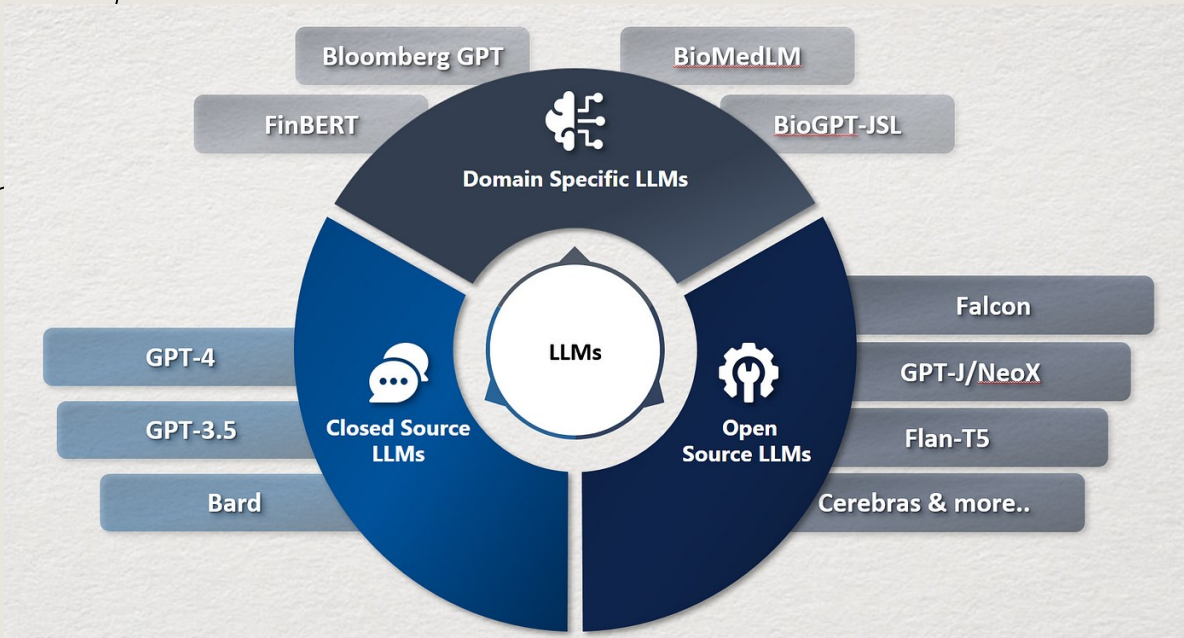
Everybody is talking about the artificial intelligence behind ChatGPT. Less noticed is a jobs market mushrooming around the technology, where these newly created roles can pay upwards of \$335,000 a year.

And for many a computer engineering degree is optional.

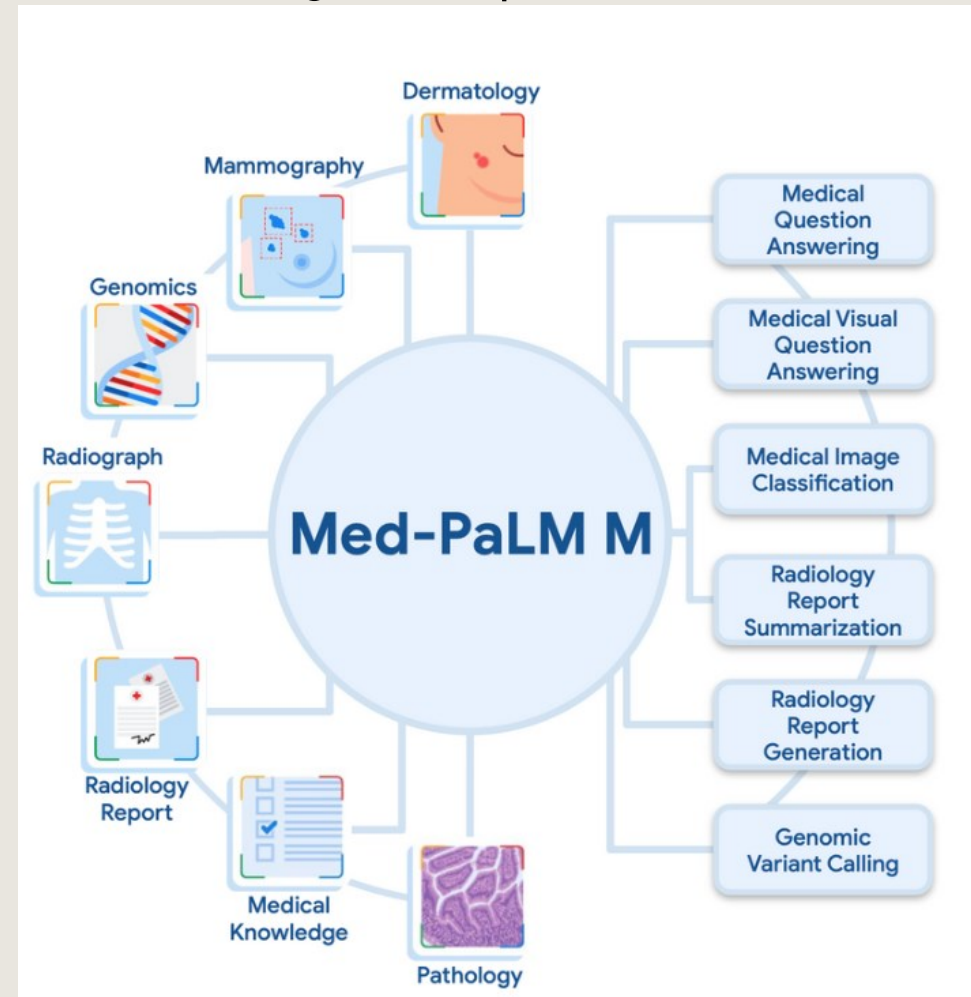
They're called "prompt engineers," people who spend their day coaxing the AI to produce better results and help companies train their workforce to harness the tools.

OTHER LLMS

Different Ways to Leverage Large Language Models (7/23)



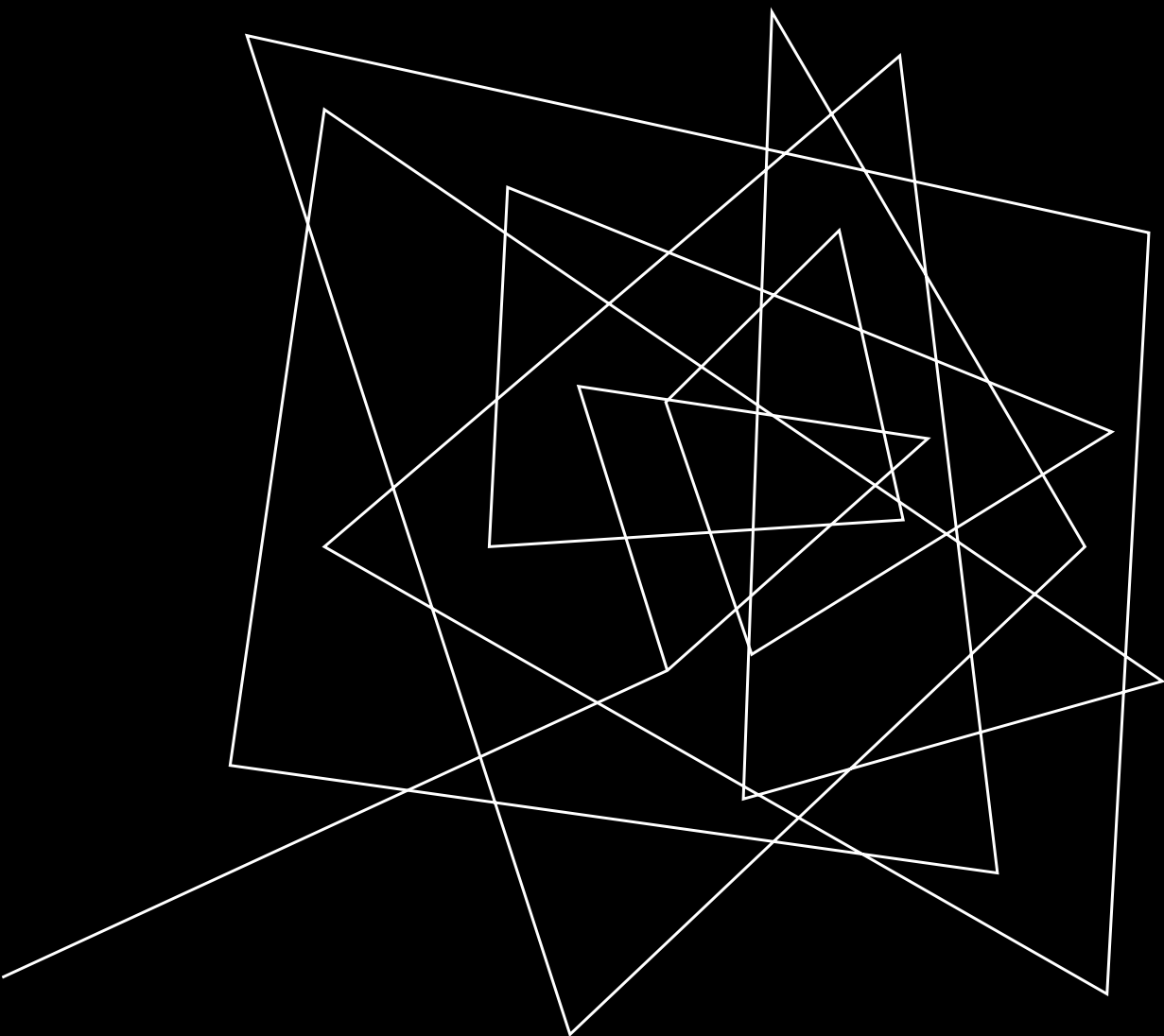
Google DeepMind (7/23)





WHAT'S NEXT?

- Regulations?
- Tools developed using AI (e.g. Gamma.app)
- Integration with other AIs (e.g. Midjourney or Dalle-2)



INTERACTIVE Q&A

A series of white, thin, overlapping geometric lines and polygons on a black background, located on the left side of the slide. The lines form various shapes, including triangles and quadrilaterals, some of which are nested or intersecting.

SUPPLEMENTAL SLIDES



**“WRITE A TRAINING PLAN FOR THIS
K AWARD APPLICATION”**

Follow-up Prompt

“WRITE A TRAINING PLAN FOR THIS K AWARD APPLICATION”

Draft 1

Draft 2

Draft 3

The following is a sample training plan for a K award application example to study the use of NLP to identify and reduce risk for mortality among Veterans with SUDs:

Research Skills

- **Didactic training:** Take courses in NLP, machine learning, and statistics.
- **Hands-on training:** Develop and validate NLP models using Veterans' data in NLP and machine learning.

Clinical Skills

- **Didactic training:** Take courses in clinical epidemiology and research methods.
- **Hands-on training:** Shadow clinicians who work with Veterans with SUDs to gain clinical experiences and perspectives.

Mentorship

- **Primary mentor:** The primary mentor should be an experienced clinician and researcher.
- **Secondary mentors:** Secondary mentors should provide expertise in NLP and suicide prevention.

Career Development

- **Attend career development workshops and seminars.**
- **Develop a network of colleagues and mentors in the field.**
- **Set career goals and develop a plan to achieve them.**

This training plan is designed to provide the candidate with the skills and experience necessary to study the use of NLP to identify and reduce risk for mortality among Veterans with SUDs. The plan includes a mix of didactic and hands-on training, mentorship, and career development activities to help the candidate achieve their goals.

Training Plan

The following training plan is designed to help me develop the skills and experience necessary to study the use of NLP to identify and reduce risk for mortality among Veterans with SUDs.

Didactic Training

- Complete a course in NLP for healthcare applications
- Attend seminars and workshops on NLP and machine learning
- Participate in a journal club on NLP and SUD research

Research Experience

- Work with my mentor to develop and implement the NLP model
- Conduct the data analysis and validation described in the protocol
- Assist with the implementation of the NLP model in the Veterans' data
- Contribute to the design and implementation of the RCT

Mentorship

I will meet with my mentor regularly to discuss my research progress and receive feedback. My mentor will provide me with opportunities to network with other researchers in the field.

Career Development Activities

- Participate in the institution's career development program
- Attend workshops on grant writing and scientific publishing
- Develop a 5-year career development plan

This training plan is designed to provide me with the skills and experience necessary to study the use of NLP to identify and reduce risk for mortality among Veterans with SUDs. The plan includes a mix of didactic and hands-on training, mentorship, and career development activities to help me achieve my goals and make significant contributions to the field.

The training plan for a K award application should be tailored to the specific needs of the candidate and the proposed research. However, there are some general principles that should be followed.

The training plan should be specific, measurable, achievable, relevant, and time-bound. It should identify specific training goals and objectives, and describe how these goals and objectives will be achieved. The training plan should also be realistic and feasible, given the candidate's current skills and experience, as well as the resources available.

The training plan should be integrated with the research plan. The training activities should be designed to help the candidate develop the skills and knowledge necessary to conduct the proposed research and to become an independent investigator.

The training plan should include a variety of training activities. These activities could include formal coursework, workshops, seminars, conferences, and hands-on research experience. The training plan should also include mentorship from experienced investigators.

The following is a sample training plan for a K award application to study the use of NLP to identify risk for mortality among Veterans with SUDs:

Year 1:

- Complete a formal course on NLP for healthcare research.
- Attend a workshop on using NLP to analyze EHR data.
- Shadow experienced investigators who are using NLP in their research.
- Begin developing a pilot study to use NLP to identify risk factors for mortality among Veterans with SUDs.

Year 2:

- Complete the pilot study and publish the results.
- Begin developing a full-scale RCT to evaluate the effectiveness of an NLP-based intervention to reduce mortality among Veterans with SUDs.
- Attend a conference on SUD research to present the pilot study results and to network with other researchers.

Year 3:

- Submit the RCT protocol for IRB approval.
- Begin implementing the RCT.
- Attend a workshop on clinical trial management.

Year 4:

- Continue implementing the RCT.
- Attend a conference on SUD research to present preliminary results from the RCT.

Year 5:

- Complete the RCT and analyze the data.
- Write and submit a manuscript for publication in a peer-reviewed journal.
- Apply for an R01 grant to continue the research.

This is just a sample training plan. The specific activities and timeline should be tailored to the individual candidate and the proposed research.

“WRITE A TRAINING PLAN FOR THIS K AWARD APPLICATION”

Draft 1

Draft 2

Draft 3

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Career Development

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- Complete the RCT and analyze the data.
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This is just a sample training plan. The specific activities and timeline should be tailored to the individual candidate and the proposed research.

“WRITE A TRAINING PLAN FOR THIS K AWARD APPLICATION” CONT.

Draft 1



A well-structured training plan is a critical component of a K award application. This training plan tailored to your research study, which focuses on Natural Language Processing (NLP) to identify mortality risk among Veterans, outlines the following activities:

Training Plan for K Award Application

Mentorship:

1. *Primary Mentorship:* Dr. [Primary Mentor's Name], an expert in addiction medicine and NLP applications in healthcare. Dr. [Name] will provide guidance on study design, data analysis, and grant writing. Dr. [Name] is scheduled to review project progress and provide feedback at [frequency].
2. *Co-Mentorship:* Dr. [Co-Mentor's Name], an expert in NLP, will provide specialized training in NLP algorithm development. Regular meetings will focus on NLP-related aspects of the project.

Didactic Training:

1. *Advanced Coursework:* Enroll in advanced courses in addiction medicine, informatics, and NLP. This includes courses such as "Addiction Medicine in Healthcare" and "Advanced NLP Techniques." Complete all coursework by the end of Year 1.
2. *Workshops and Seminars:* Attend relevant workshops and seminars on addiction medicine, NLP, and healthcare informatics annually to stay updated on emerging trends and technologies.

Research Activities:

1. *NLP Training:* Acquire in-depth knowledge of NLP techniques, including feature extraction, and machine learning models to facilitate the development and validation of NLP algorithms.
2. *Clinical Research Skills:* Gain experience in conducting human subjects research ethically and efficiently. Participate in data collection from Veterans and analyze the results.

Professional Development:

1. *Grant Writing:* Attend grant writing workshops and conferences to develop skills in grant development. Submit at least [number] grant applications during the project period.
2. *Publication Strategy:* Develop a plan to publish research findings. Aim to publish at least [number] peer-reviewed articles during the project period.

Career Development:

1. *Networking:* Build professional relationships with experts in addiction medicine, NLP, and informatics through collaborations, conference presentations, and networking events.
2. *Teaching and Outreach:* Participate in teaching opportunities related to addiction medicine and informatics. Engage in outreach activities to educate the community about substance use disorder risks and interventions.

Timeline:

- Year 1: Focus on didactic training, NLP algorithm development, and initiation of data collection.
- Year 2: Continue data collection, refine NLP algorithms, and submit the first grant application for external funding.
- Year 3: Complete data analysis, intervention RCT, and publish initial findings.
- Year 4: Continue publishing results, grant writing, and networking activities.
- Year 5: Finalize the research project, submit additional grant applications, and prepare for career transition.

This comprehensive training plan demonstrates a commitment to both research and career development, aligning with the goals of a K award from the National Institute on Alcohol Abuse and Alcoholism (NIAAA). It provides a clear roadmap for the researcher's growth and contributions to the field of addiction medicine and NLP.

“WRITE A TRAINING PLAN FOR THIS K AWARD APPLICATION” CONT.

Draft 1



A well-structured training plan is a critical component of a K award application. This training plan tailored to your research study, which focuses on Natural Language Processing (NLP) to identify mortality risk among Veterans, outlines the following activities:

Training Plan for K Award Application

Mentorship:

1. *Primary Mentorship:* Dr. [Primary Mentor's Name], an expert in addiction medicine and NLP applications in healthcare. Dr. [Name] will provide guidance on study design, data analysis, and grant writing. Dr. [Name] is scheduled to review project progress and provide feedback quarterly.
2. *Co-Mentorship:* Dr. [Co-Mentor's Name], an expert in NLP, will provide specialized training in NLP algorithm development. Monthly meetings will focus on NLP-related aspects of the project.

Didactic Training:

1. *Advanced Coursework:* Enroll in advanced coursework in addiction medicine, informatics, and NLP. This includes courses such as "Addiction Medicine in Healthcare" and "Advanced NLP Techniques." Complete all coursework by the end of Year 1.
2. *Workshops and Seminars:* Attend relevant workshops and seminars on addiction medicine, NLP, and healthcare informatics annually to stay updated on emerging trends and technologies.

Research Activities:

1. *NLP Training:* Acquire in-depth knowledge of NLP techniques, including feature extraction, and machine learning models to facilitate the development and implementation of NLP algorithms.
2. *Clinical Research Skills:* Gain experience in conducting human subjects research ethically and efficiently. Participate in data collection from Veterans and analyze the data.

Professional Development:

1. *Grant Writing:* Attend grant writing workshops and conferences to develop grant development. Submit at least one grant application for external funding by the end of Year 2.
2. *Publication Strategy:* Develop a plan to publish research findings. Aim to publish at least [number] peer-reviewed articles during the period.

Career Development:

1. *Networking:* Build professional relationships with experts in addiction medicine, NLP, and informatics through collaborations, conference presentations, and networking events.
2. *Teaching and Outreach:* Participate in teaching opportunities related to addiction medicine and informatics. Engage in outreach activities to educate the community about substance use disorder risks and interventions.

Timeline:

- Year 1: Focus on didactic training, NLP algorithm development, and initiation of data collection.
- Year 2: Continue data collection, refine NLP algorithms, and submit the first grant application for external funding.
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This comprehensive training plan demonstrates a commitment to both research and career development, aligning with the goals of a K award from the National Institute on Alcohol Abuse and Alcoholism (NIAAA). It provides a clear roadmap for the researcher's growth and contributions to the field of addiction medicine and NLP.

“WRITE A TRAINING PLAN FOR THIS K AWARD APPLICATION” CONT.

Draft 2



Creating a comprehensive training plan for a K award application, such as the National Institute on Alcohol Abuse and Alcoholism (NIAAA), is crucial to demonstrate your commitment to career development and to ensure the success of your research. Here's a sample training plan:

Title: Training Plan for Career Development (K Award) Application

Applicant: [Your Name]

Mentor(s): [Name(s) of Mentor(s)]

Institution: [Name of Your Institution]

Training Goals:

- 1. **Enhance Research Skills:** Develop advanced research skills and expertise in Natural Language Processing (NLP), substance use disorders, and health analytics to successfully conduct research on identifying mortality risk in Veterans.
- 2. **Promote Interdisciplinary Knowledge:** Foster interdisciplinary collaboration to enhance my understanding of related fields, including addiction medicine, epidemiology, and informatics, to bring a holistic perspective to my research.
- 3. **Facilitate Career Advancement:** Establish a solid foundation for an independent career in addiction and substance abuse research, with a focus on improving health outcomes for Veterans.

Training Activities:

Year 1:

- 1. **Coursework:** Enroll in advanced courses in NLP, machine learning, and statistics to gain technical skills required for the development of the NLP-RAT.
- 2. **Literature Review:** Conduct an extensive literature review on NLP applications in healthcare, focusing on the current state of research in the field, to inform the design of the NLP-RAT.
- 3. **Mentorship:** Engage in regular meetings with my mentor(s) to discuss progress, refine research questions, and develop a detailed research plan.
- 4. **Research Design:** Collaborate with mentors to design and implement the NLP-RAT, including data collection and validation methods, as well as statistical analysis and testing.

Year 2:

- 1. **Data Acquisition:** Begin the process of acquiring the necessary data from healthcare facilities and other relevant sources, ensuring compliance with legal regulations.
- 2. **NLP Development:** Work closely with experts in NLP to develop the NLP-RAT, with an emphasis on accuracy and reliability.
- 3. **RCT Preparation:** Prepare for the RCT by developing the necessary protocols, obtaining necessary approvals, and recruiting eligible participants.

Year 3:

- 1. **RCT Implementation:** Conduct the RCT, including participant randomization, intervention delivery, and data collection.
- 2. **Data Analysis:** Analyze the data collected from both the NLP-RAT validation and the RCT to evaluate the effectiveness of interventions and assess the risk factors associated with mortality.
- 3. **Dissemination:** Prepare manuscripts for publication in peer-reviewed journals, present findings at conferences, and engage in knowledge dissemination activities to share research outcomes with the scientific community.

Career Development Activities:

- 1. **Grant Writing Workshops:** Participate in grant writing workshops to acquire skills in writing successful grant proposals and securing independent research funding.
- 2. **Ethical Research Training:** Attend ethics training seminars and workshops to ensure the ethical conduct of research, especially when dealing with sensitive healthcare data.
- 3. **Teaching and Mentoring:** Engage in teaching or mentoring opportunities to enhance communication and leadership skills, as well as contribute to the academic community.
- 4. **Networking:** Attend conferences, workshops, and networking events to establish connections with experts in addiction research and NLP.

Evaluation and Monitoring:

Regularly meet with mentor(s) to assess progress, address challenges, and adjust the training plan as needed to meet career development and research goals.

This training plan outlines a structured path for career development, research skill enhancement, and knowledge dissemination, all of which are essential components for a successful K award application to NIAAA. Adapt it to your specific needs and goals, and work closely with your mentor(s) to refine and finalize your plan.