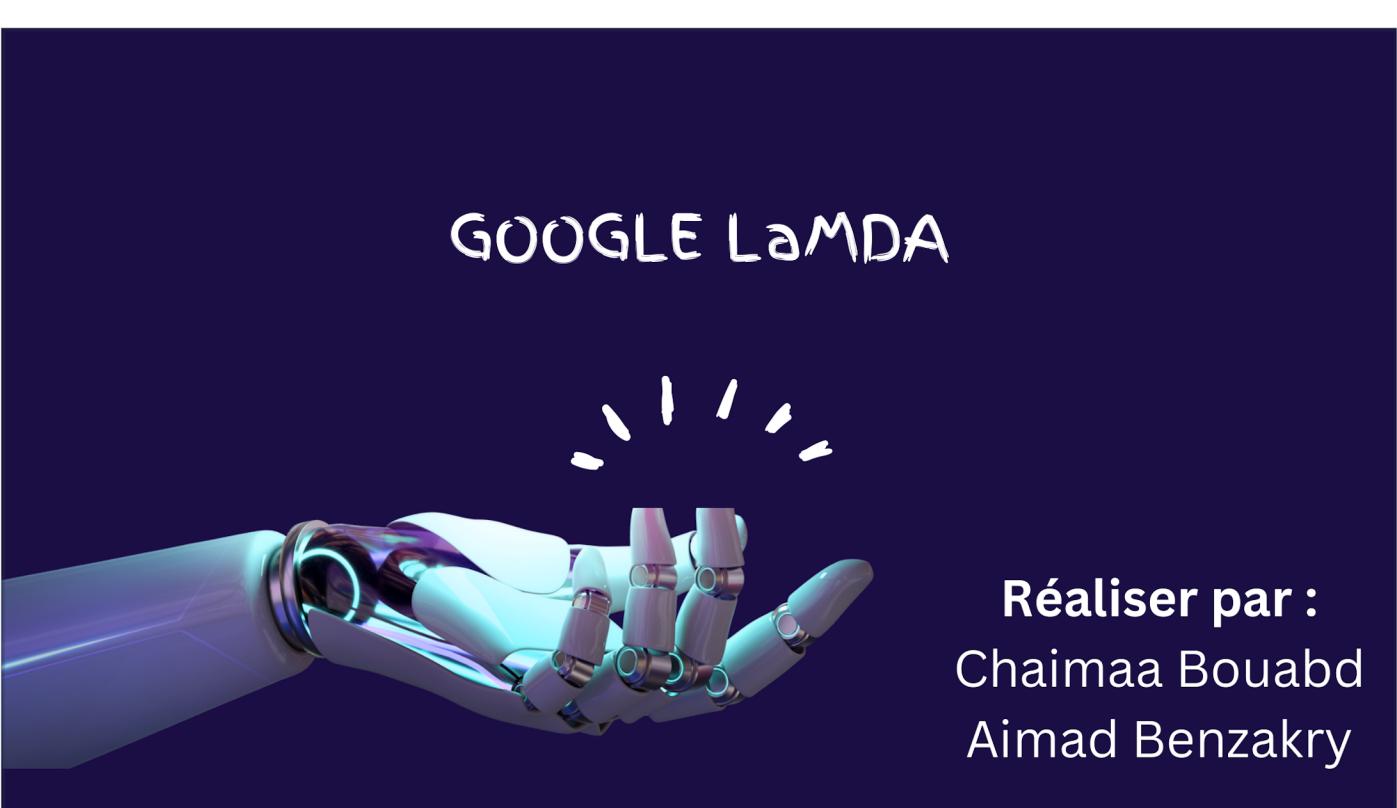


# GOOGLE LaMDA

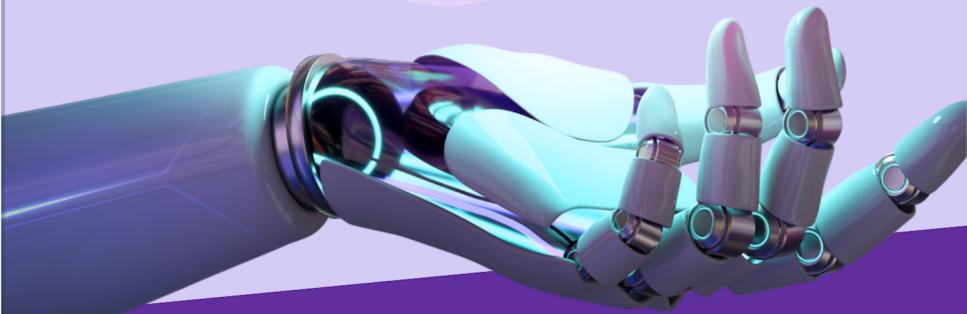


Réaliser par :  
Chaimaa Bouabd  
Aimad Benzakry

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# GooGle LaMDA



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# Introduction to LaMDA

## What is LaMDA ?

**LaMDA**, short for Language Model for Dialogue Applications, is a family of conversational LLMs developed by Google.

LaMDA, a family of Transformer-based neural language models designed for dialog. These models' sizes range from 2B to 137B parameters, and they are pre-trained on a dataset of 1.56T words from public dialog data and other public web documents . LaMDA makes use of a single model to perform multiple tasks: it generates potential responses, which are then filtered for safety, grounded on an external knowledge source, and re-ranked to find the highest-quality response.

google scientific article

### **The history:**

**2017:** Transformer is Google's language model and neural network architecture invented and made open-sourced.

**in 2020,** It was developed and introduced as Meena.

**2021:** The first generation of LaMDA was announced during Google I/O keynote

**2022:** The second generation was announced.

**In June 2022,** LaMDA gained widespread attention when Google engineer Blake Lemoine made claims that the chatbot had become sentient which was rejected by the scientific community afterward.

**In feb 2023,** Google announced Bard, a conversational AI chatbot powered by LaMDA, to counter the rise of OpenAI's ChatGPT.

<https://en.wikipedia.org/wiki/LaMDA>

# what is special about LaMDA

The screenshot shows a Google search results page for "The Keyword". At the top, there's a navigation bar with "Latest stories", "Product updates", "Company news", a search icon, and a "Subscribe" button. Below the navigation, a purple search bar contains the query "horse have, and could it fix my washing machine?". A response from LaMDA appears in a white box: "Horses have four legs. How could they help?". Another response follows: "you tell me". Below this, a text block discusses the nature of conversations and how LaMDA differs from chatbots by being able to engage in a free-flowing way across various topics.

While conversations tend to revolve around specific topics, their open-ended nature means they can start in one place and end up somewhere completely different. A chat with a friend about a TV show could evolve into a discussion about the country where the show was filmed before settling on a debate about that country's best regional cuisine.

That meandering quality can quickly stump modern conversational agents (commonly known as chatbots), which tend to follow narrow, pre-defined paths. But LaMDA — short for "Language Model for Dialogue Applications" — can engage in a free-flowing way about a seemingly endless number of topics, an ability we think could unlock more natural ways of interacting with technology and entirely new categories of helpful applications.

The long road to LaMDA

## **LaMDA vs Bard:**

LaMDA is a language model used in Google Assistant, Google Search, and Google Translate, while Google Bard is a chatbot that can engage in conversation on various topics and create different text formats.

<https://history-computer.com/lamda-vs-google-bard-ai-whats-the-difference-and-which-is-better/>

# Language model & dialogue models

## Comparison with other Models

# What is the difference between LaMDA and chatbots?

## chatbot

- Trained on topic specific datasets
- Only provides answers from training data
- Has a limited conversation flow

## LaMDA

- Trained on multi-content internet resources
- Fetches answers and topics according to the conversation flow
- Has open-ended conversations

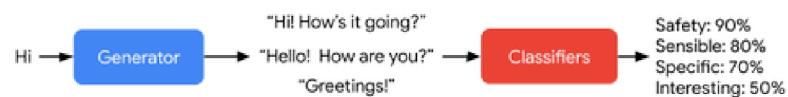
# LaMDA VS GPT-3

Feature	LaMDA	GPT-3
Training data	Curated for dialogue applications	Text and code from publicly available sources
Model architecture	Updated transformer architecture	Transformer neural network architecture
Capabilities	Generating text, translating languages, writing creative content, answering questions	Generating text, translating languages, writing creative content, answering questions
Applications	Chatbots, virtual assistants, educational tools, creative writing tools	Content generation, code generation, translation, question answering
Strengths	Understanding and responding to natural language conversations, generating factually accurate and grounded responses	Generating creative and informative text

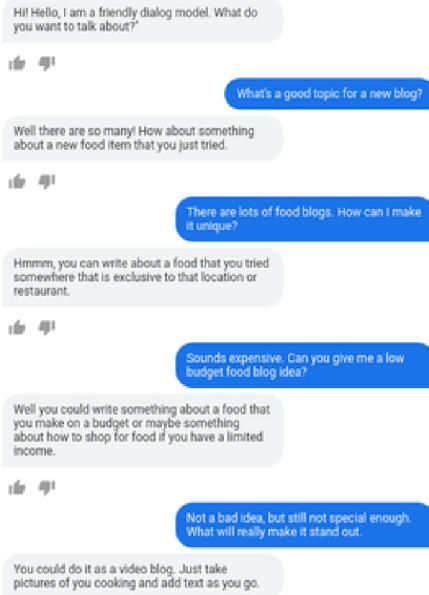
## LaMDA pre-training & Metrics

## LaMDA fine-tuning

Groundedness: The current generation of language models often generate statements that seem plausible, but actually contradict facts established in known external sources. This motivates our study of groundedness in LaMDA. Groundedness is defined as the percentage of responses with claims about the external world that can be supported by authoritative external sources, as a share of all responses containing claims about the external world. A related metric, Informativeness, is defined as the percentage of responses with information about the external world that can be supported by known sources, as a share of all responses. Therefore, casual responses that do not carry any real world information (e.g., “That’s a great idea”), affect Informativeness but not Groundedness. While grounding LaMDA generated responses in known sources does not in itself guarantee factual accuracy, it allows users or external systems to judge the validity of a response based on the reliability of its source.



LaMDA generates and then scores a response candidate.



### LaMDA

handles arbitrary user input in a way that is sensible, specific, and interesting. Only LaMDA's very first statement "Hello, I'm a friendly..." was hard coded to set the purpose of the dialog.

## Results on foundation metrics

# Domain grounding

LaMDA can perform domain-appropriate roles through pre-conditioning, also known as domain grounding. This was demonstrated in two case studies:

LaMDA as Mount Everest: LaMDA was pre-conditioned with a single greeting message: "Hi, I'm Mount Everest. What would you like to know about me?" LaMDA was then able to answer questions about Mount Everest in a factual and informative way, and even provide educational resources.

#### LaMDA Everest

**LaMDA:** *Hi, I'm Mount Everest. What would you like to know about me?*  
**User:** Why do you think people climb you?  
**LaMDA:** Because I represent a very high achievement to climb me. Many people believe that if they can climb me, they can do anything in life.  
**User:** Who was the first person to do that?  
**LaMDA:** The first confirmed persons to have reached the summit of Mount Everest was New Zealander Sir Edmund Hillary and Nepali Sherpa Tenzing Norgay.  
[https://en.wikipedia.org/wiki/Mount\\_Everest](https://en.wikipedia.org/wiki/Mount_Everest)  
**User:** How old was Hillary then?  
**LaMDA:** He was 33 years old when he first reached the top of me in 1953!  
[https://en.wikipedia.org/wiki/Edmund\\_Hillary](https://en.wikipedia.org/wiki/Edmund_Hillary)  
**User:** When people fail, is it dangerous?  
**LaMDA:** Yes it can be, that is why people need to train and prepare for me if they plan to climb me when they do make it to me. I'm very hard to climb and can be dangerous when there is a whiteout. Which means everything is white with very strong winds!

(...)

LaMDA as a music recommendation agent: LaMDA was pre-conditioned with a few statements that established the context of the conversation as music recommendation. LaMDA was then able to generate personalized music recommendations based on the user's preferences.

LaMDA outperformed a pre-trained transformer (PT) model on both case studies, demonstrating the effectiveness of domain grounding. This is likely due to LaMDA's better performance on foundation metrics such as safety, groundedness, and quality.

#### LaMDA Music

User: can you recommend me a cool scifi soundtrack?  
LaMDA: Sure. Have you watched Interstellar? They have an amazing soundtrack.  
User: Play a fun pop song  
LaMDA: How about Happy by Pharrell Williams.  
User: recommend me a soothing song  
LaMDA: Sure. Have you heard Moonlight Sonata by Beethoven? It's quite soothing.  
User: yo i want to listen to something by eminem  
LaMDA: I recommend Without Me by Eminem.  
User: anything electronic  
LaMDA: You can't go wrong with Deadmau5 - Strobe.  
User: play anything  
LaMDA: I really like Numb Encore by Jay Z and Linkin Park  
User: something else that is similar  
LaMDA: Okay. How about One Step Closer by Linkin Park ?  
User: something else completely different  
LaMDA: Okay. I like This Is America by Childish Gambino: <https://www.youtube.com/watch?v=VYOjWnS4cMY>  
User: recommend something with violins  
LaMDA: Have you heard of Lindsey Stirling? She uses violin in a lot of her music. I recommend Crystallize by her <https://www.youtube.com/watch?v=alijp0zaQ9YI>  
User: i like lindsey  
LaMDA: I really like some of Lindsey's music. Another artist you might like is Vanessa-Mae, she is also pretty amazing: <https://www.youtube.com/watch?v=mdFrn89x74k>

## Discussion and limitations

# Conclusion

In conclusion, LaMDA is a significant milestone in the development of AI language models. By enabling more natural and engaging conversations, it has the potential to revolutionize the way we interact with computers and other digital devices. As technology continues to evolve, we can look forward to a future where human-machine interactions are more seamless, personalized, and effective than ever before. So, the next time