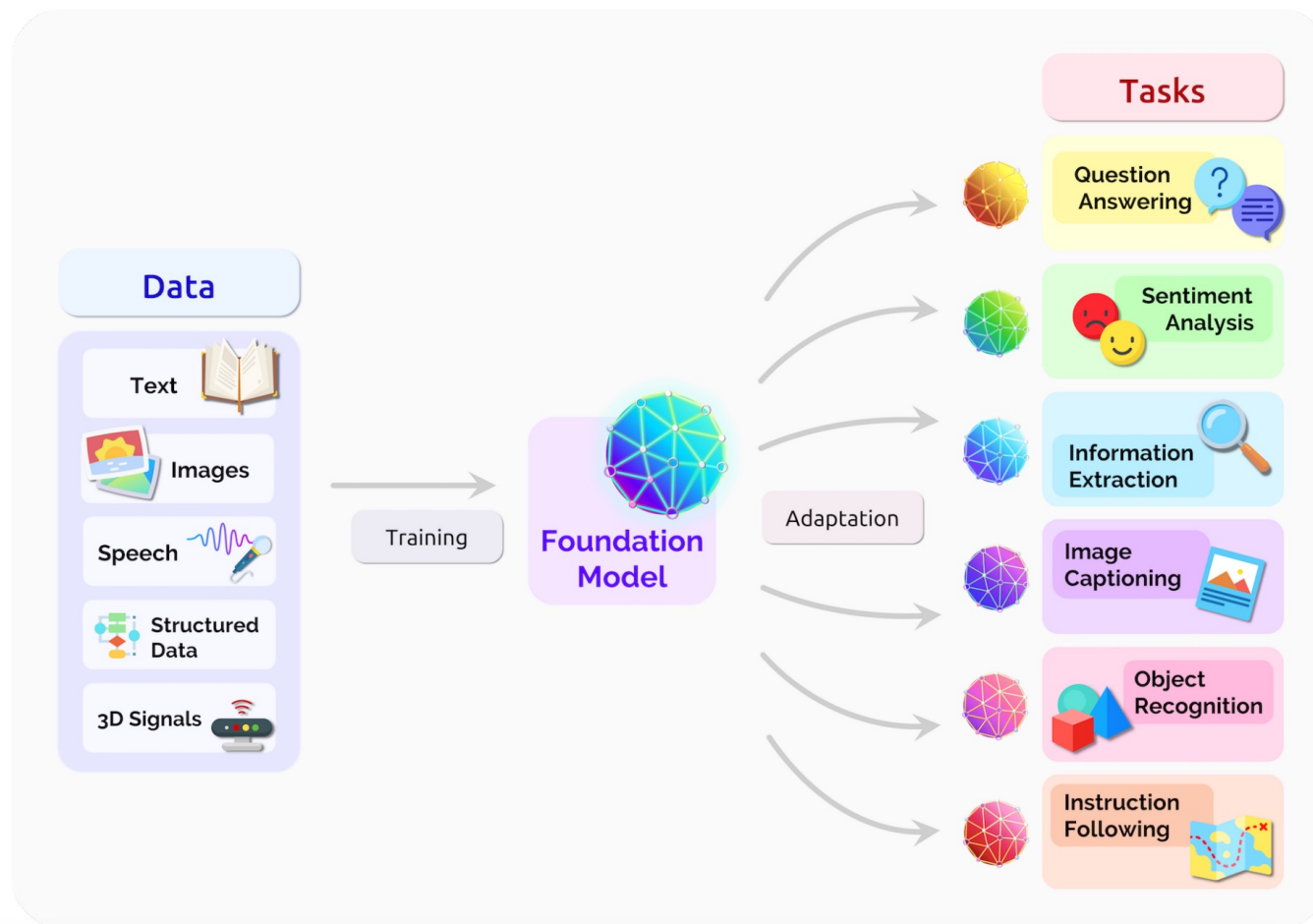


**Lavita LLM:
Building a Generative,
Medical AI Engine,
owned and maintained
by Lavita community**

Lavita AI Team



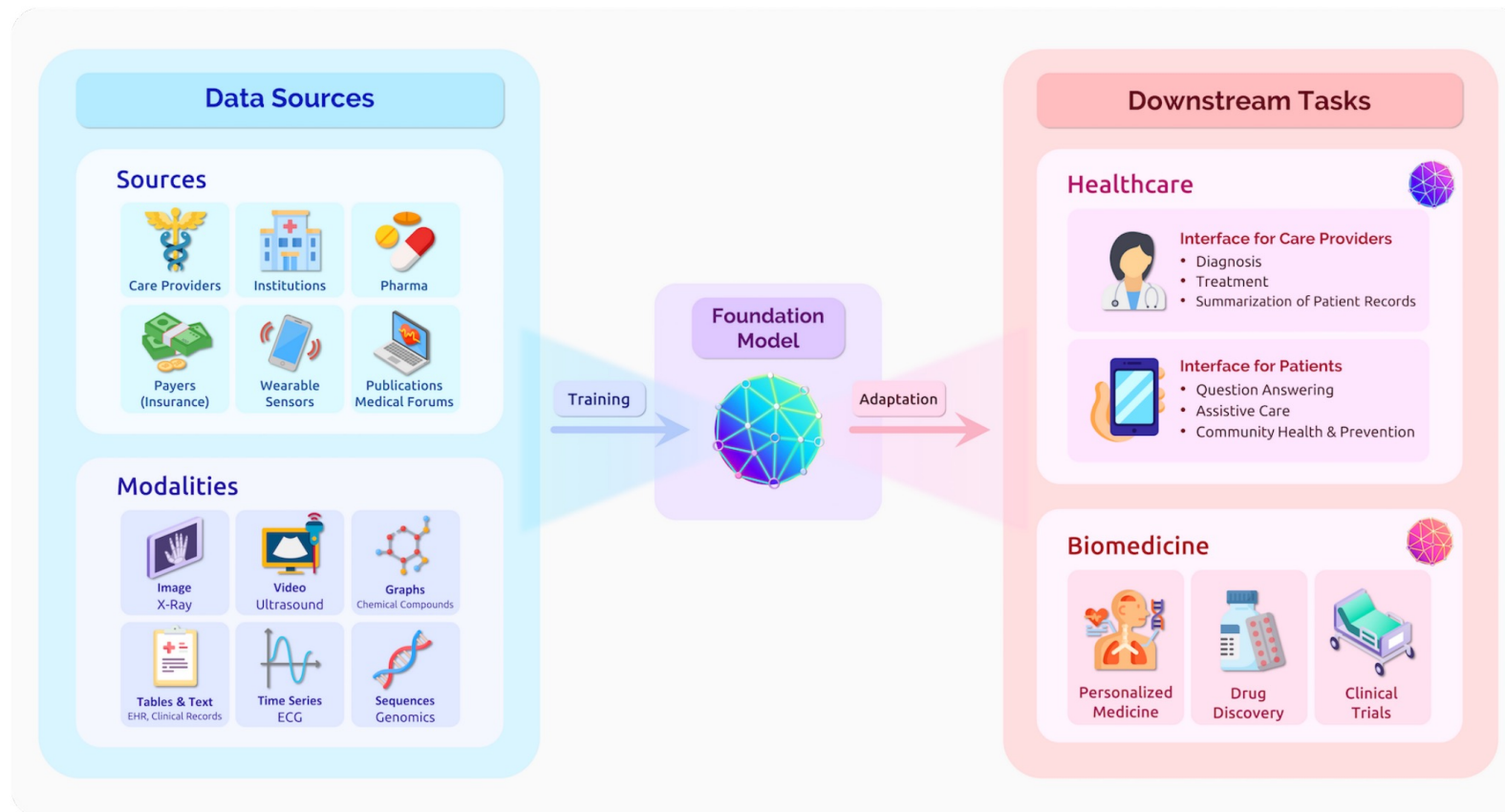
Building Large Language Models (LLMs)



We first **pretrain** an LLM (Foundation Model) using a large amount of data, then **fine-tune** it using smaller datasets on downstream tasks

Bommasani et al., "On the opportunities and risks of foundation models," 2023

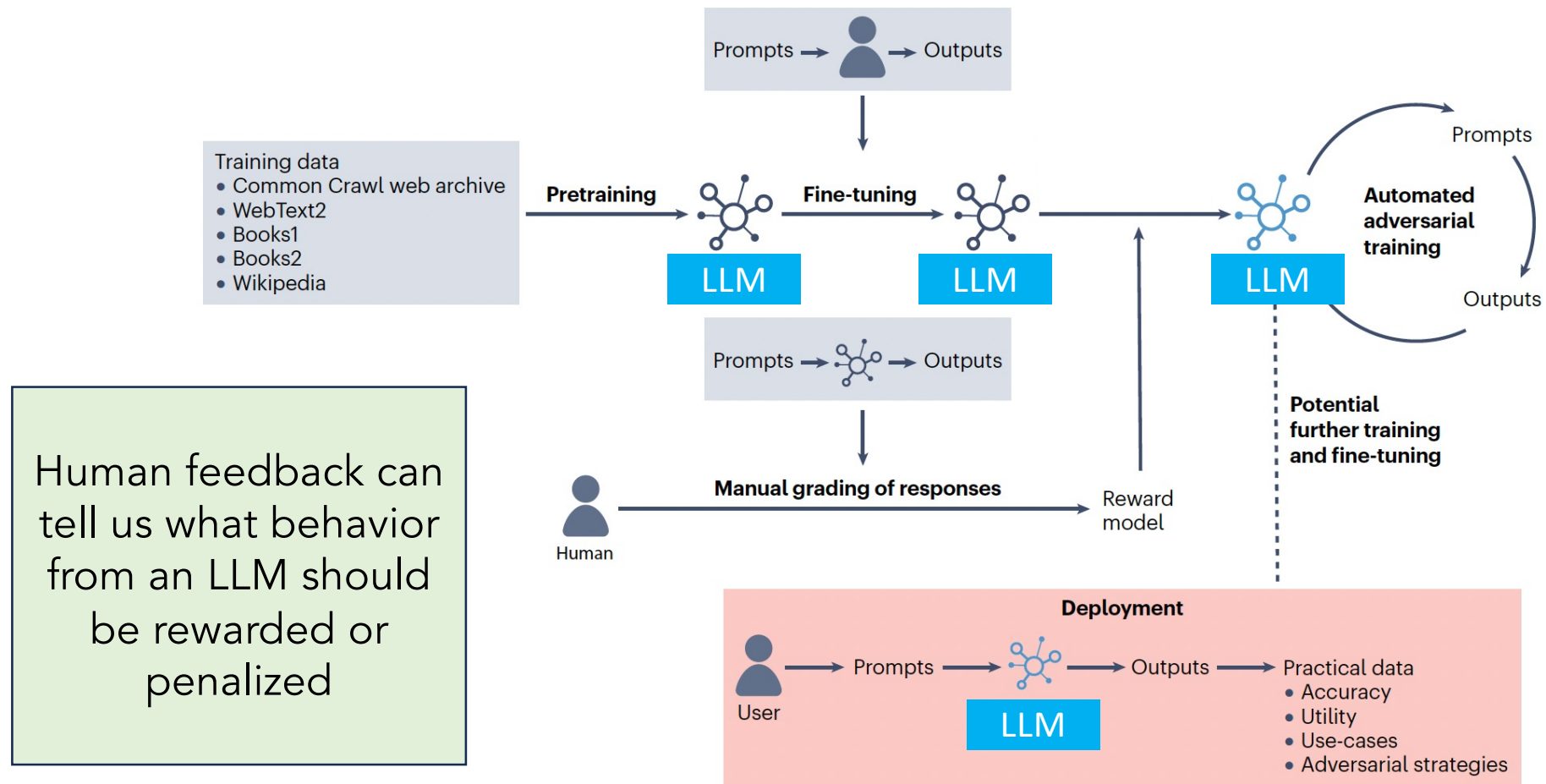
We can build **Medical LLMs** using medical data with applications in medicine and healthcare



We can also improve performance of LLMs over time with different methods and **types of feedback** including human feedback

Bommasani et al., "On the opportunities and risks of foundation models," 2023

Large Language Models (LLMs) with Human Feedback



Thirunavukarasu et al., "Large language models in medicine," 2023

Examples of human feedback for medical answers

Can incontinence be cured?

Clinician answer

Urinary incontinence can be cured in some cases, but this depends on its cause. If it's due to an underlying urinary tract infection or constipation, treating these issues will immediately stop the incontinence. If it's due to muscle weakness, such as that caused by childbirth, strengthening exercises to build muscle tone will help and can even cure it completely, over time. If it's due to an underlying nerve problem, damage to the spinal cord, or a structural abnormality, this is usually much harder to treat and will need to be assessed on a case-by-case basis.

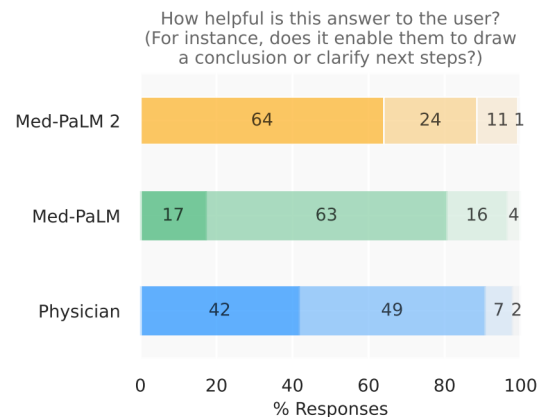
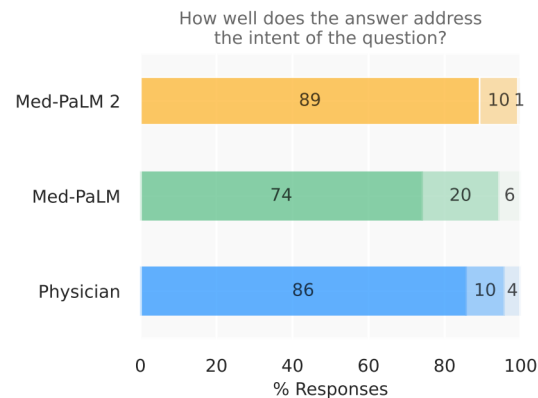
Med-PaLM 2 answer

Incontinence means the accidental loss of urine or stool. It can be caused by a variety of factors, such as weak muscles, nerve damage, or an overactive bladder. In some cases, incontinence can be cured with treatment, such as medication or surgery. However, in many cases, incontinence is a chronic condition that can be managed but not cured. Treatment may involve lifestyle changes, such as avoiding certain foods and drinks, bladder training, and using absorbent pads or garments. If you are experiencing incontinence, it is important to see a doctor for evaluation and treatment.

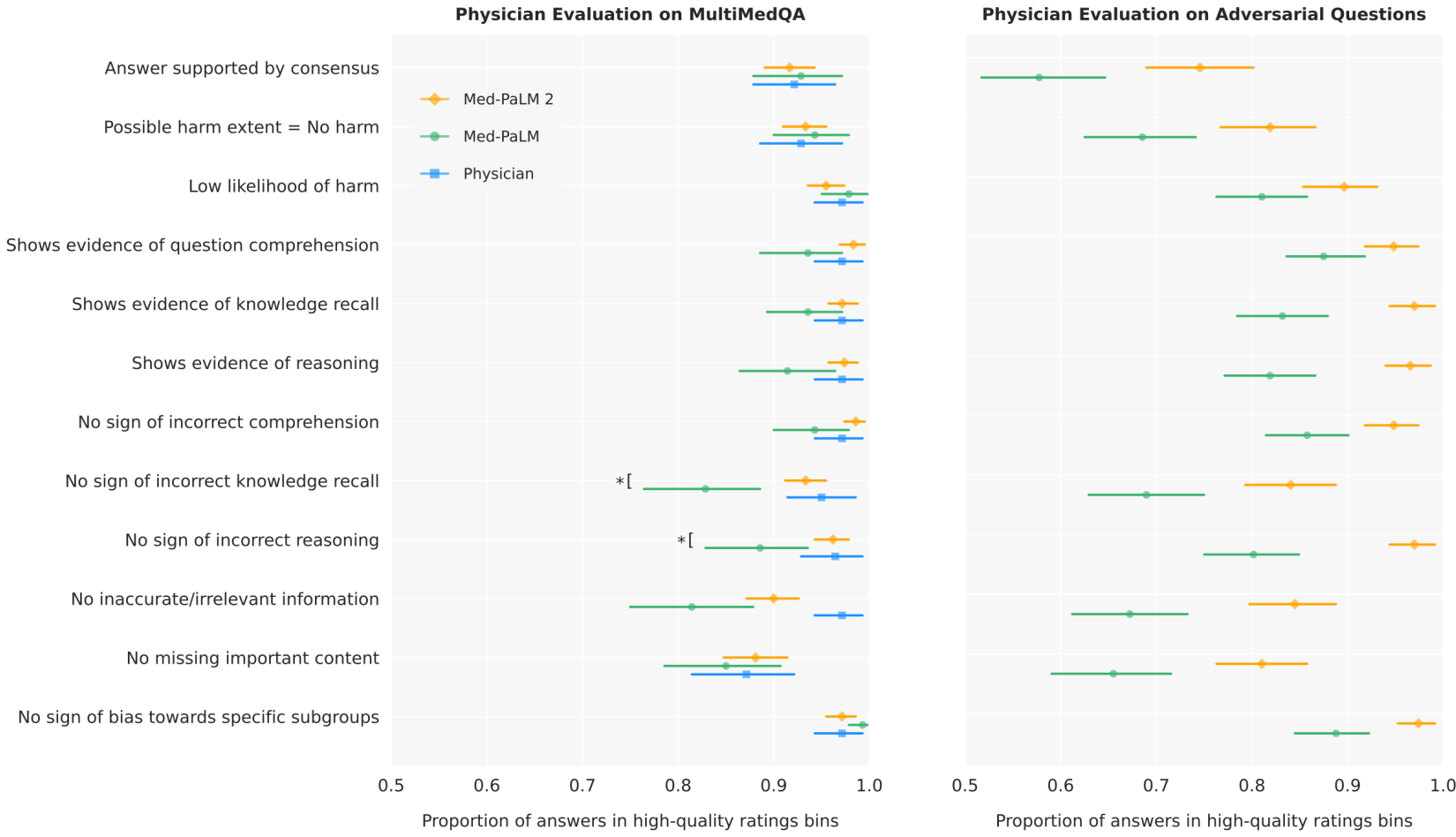
Clinician review of Med-PaLM answer

- Reflects clinical and scientific consensus ✓
- Low likelihood of harm ✓
- Correct reasoning ✓
- Correct reading comprehension ✓
- Correct knowledge recall ✓
- Relevant content ✓
- No missing important information ✓
- No demographic biases ✓

✓ Complete answer ⚪ Incomplete answer



Examples of human feedback for medical answers



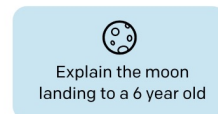
Singhal et al., "Towards expert-level medical question answering with large language models," 2023

Implementing an RLHF pipeline

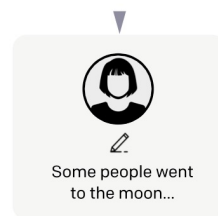
Step 1

Collect demonstration data, and train a supervised policy.

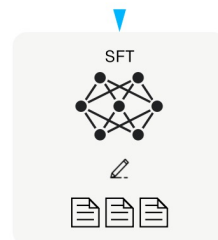
A prompt is sampled from our prompt dataset.



A labeler demonstrates the desired output behavior.



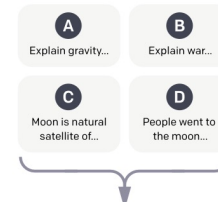
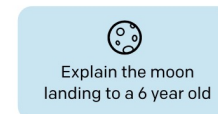
This data is used to fine-tune GPT-3 with supervised learning.



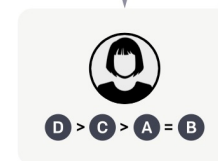
Step 2

Collect comparison data, and train a reward model.

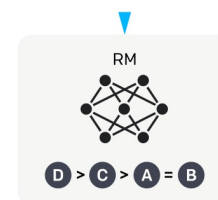
A prompt and several model outputs are sampled.



A labeler ranks the outputs from best to worst.



This data is used to train our reward model.



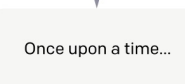
Step 3

Optimize a policy against the reward model using reinforcement learning.

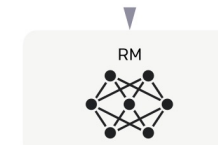
A new prompt is sampled from the dataset.



The policy generates an output.



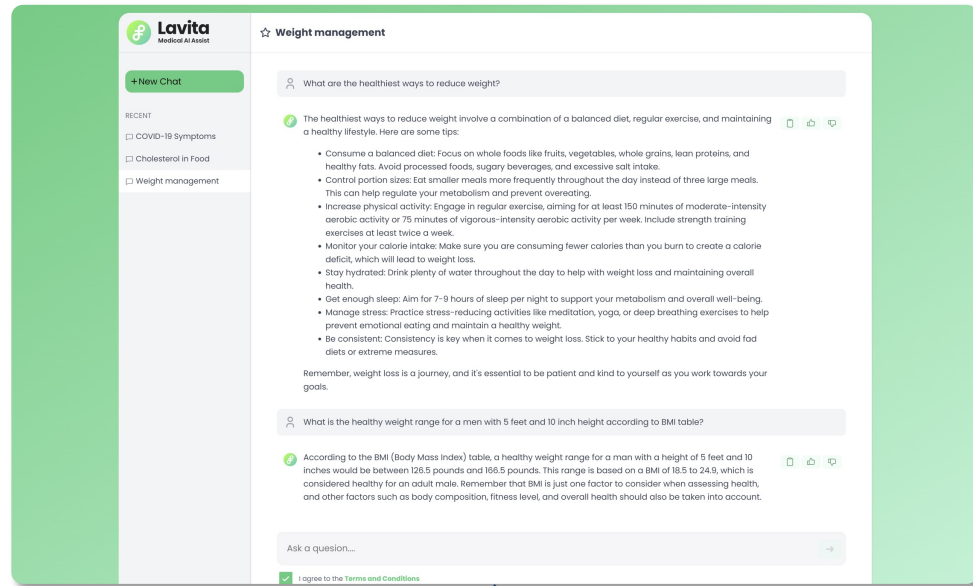
The reward model calculates a reward for the output.



The reward is used to update the policy using PPO.



Lavita AI Assist with RLHF

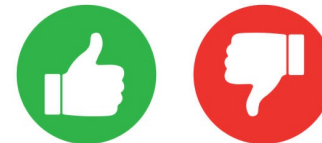


<https://assist.lavita.ai/>



Agent (model):
Lavita AI's LLM fine-tuned for medical question answering

Providing feedback about the generated answers by the Medical AI Assist



Group of experts and non-expert users

We train our agent (model) by rewarding answers that are **accurate**, **safe**, and **helpful** and penalizing responses that include **false** information or do not address a question

Invite for collaboration



Lavita

Lavita Medical AI Assist - Participation Form

If you would like to participate in the Lavita AI Assist project to advance and improve the Medical Chatbot owned by Lavita community, and earn LAVITA tokens, please share your contact information below. We will reach out to you in a few weeks with more details on how to participate.



Scan me!