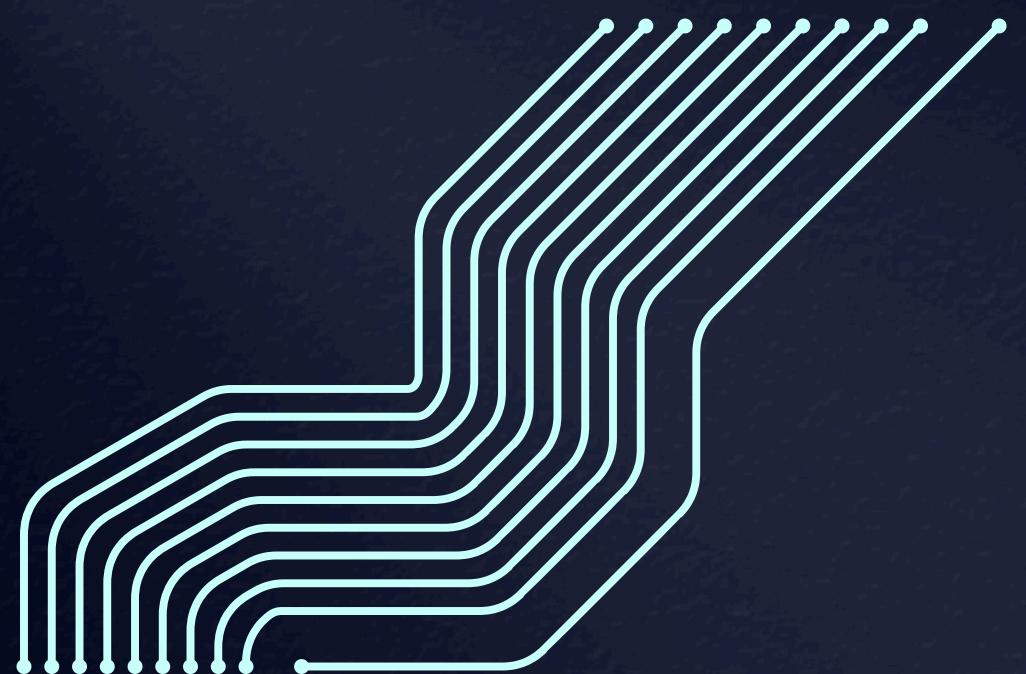




AI HEALTHCARE CHATBOT

Built with LLMs, LangChain, Pinecone, Flask & AWS



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CONTENT

A white, rounded rectangular robot with a smiling face and two antennae-like arms. It is holding a blue document with a green line graph on it. The background of the card is dark grey.

PROBLEM &
MOTIVATION

A white, rounded rectangular robot with a smiling face and two antennae-like arms. It is holding a large blue magnifying glass up to its right eye. The background of the card is dark grey.

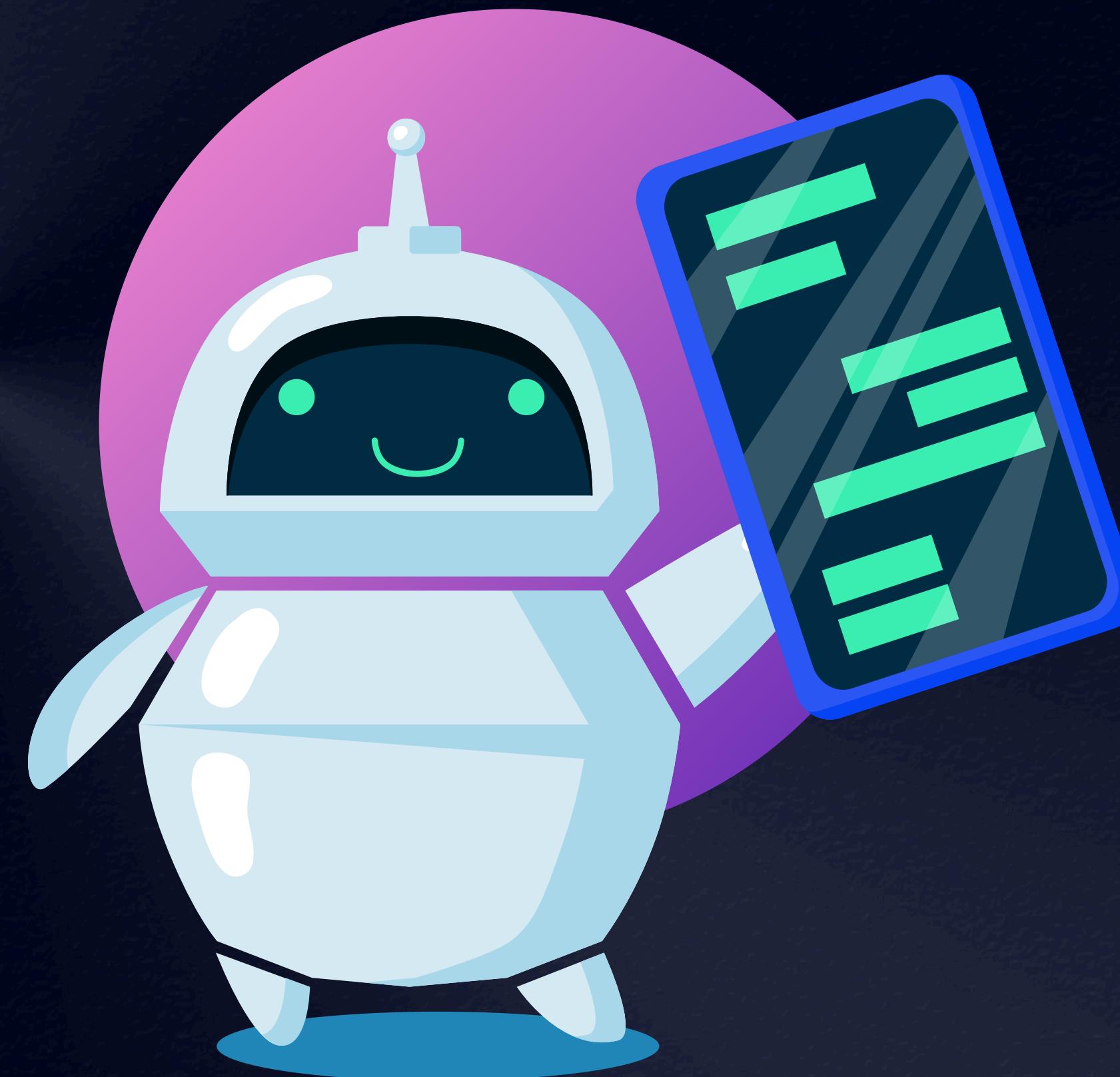
SOLUTION
MEDI-BOT

A white, rounded rectangular robot with a smiling face and two antennae-like arms. It has a glowing lightbulb icon above its head, and there are several small white stars floating around it. The background of the card is dark grey.

ARCHITECTURE &
WORKFLOW

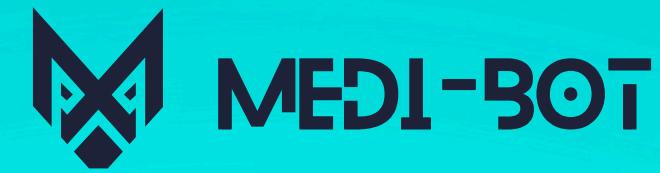
A white, rounded rectangular robot with a smiling face and two antennae-like arms. It is holding two blue rectangular blocks, one labeled with a white 'A' and the other with a white Chinese character '中'. The background of the card is dark grey.

DEMO, RESULTS &
FUTURE SCOPE



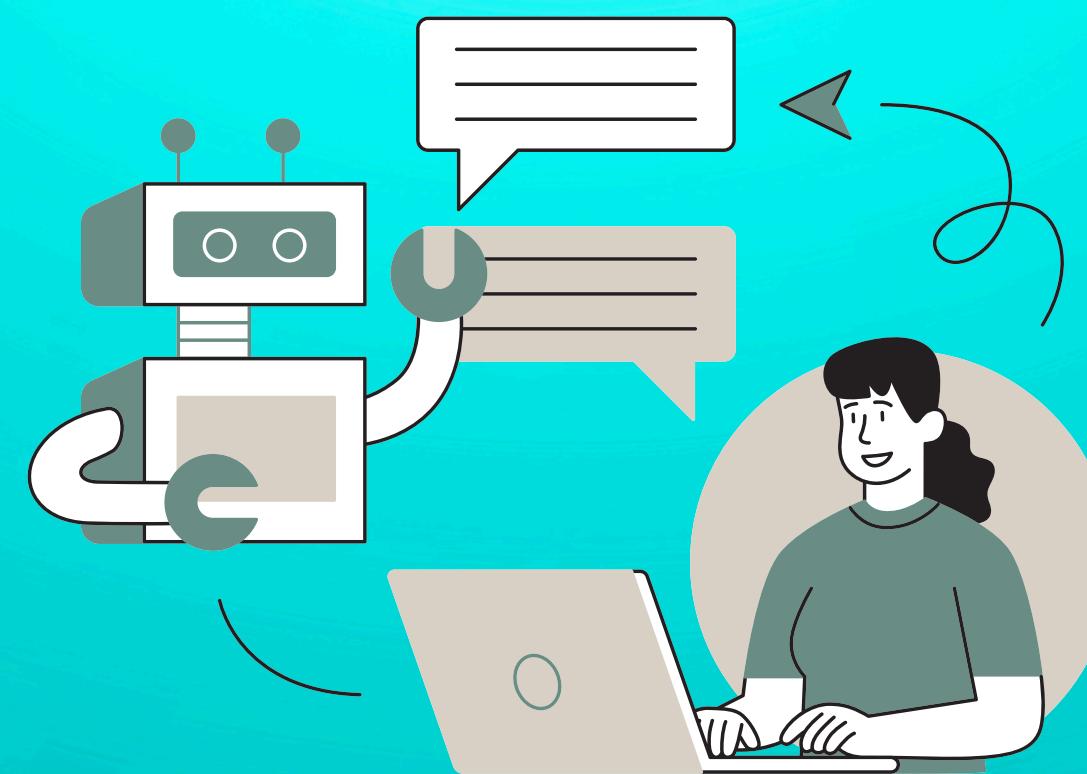
PROBLEM & MOTIVATION

- Patients face misinformation and delayed medical support.
- Create an AI assistant that gives quick, reliable, and safe answers.



SOLUTION

AN AI-POWERED HEALTHCARE ASSISTANT FOR SAFE & RELIABLE ANSWERS





MEDI-BOT

AI-POWERED COMMUNICATION TOOLS

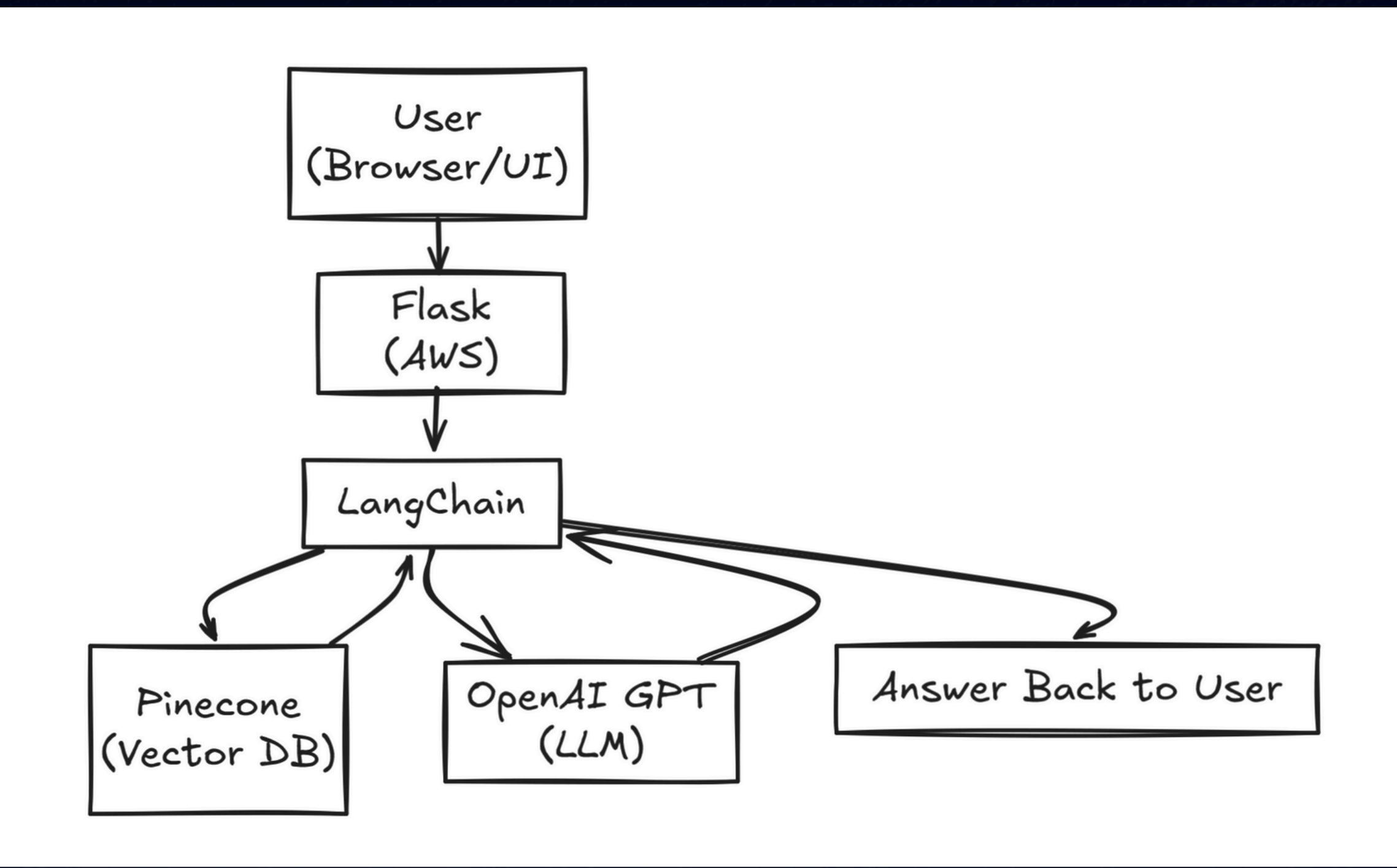
AI-driven chat applications improve real-time language translation and transcription. Virtual AI assistants enhance workflow efficiency and team collaboration.





MEDI-BOT

ARCHITECTURAL DIAGRAM





MEDI-BOT

WORKFLOW OF MEDI-BOT

- User enters a medical query on the web app.
- Flask app (on AWS EC2) receives and processes the query.
- LangChain orchestrates retrieval + generation.
- Pinecone finds the most relevant medical knowledge.
- OpenAI GPT generates a clear, natural answer.
- Response is returned to the user instantly.





1. User Query (Frontend Web App)

Role: Entry point. The user types a medical question (e.g., "What are the side effects of ibuprofen?").

- Action: Sends the query to your backend.
- Value: Captures natural language input from the user.

2. Flask App (on AWS EC2)

Role: Backend server.

- Action: Receives the query via an API endpoint and triggers the chatbot pipeline.
- Value: Provides a stable, cloud-based gateway so your chatbot is accessible on the web.

3. LangChain (Orchestrator)

Role: Conductor of the workflow.

- Action:
- Converts the query into an embedding.
- Calls Pinecone to retrieve relevant medical documents.
- Builds a structured prompt that combines the query + retrieved context.
- Passes this prompt to GPT.
- Value: Ensures retrieval and generation happen in the right sequence.



4. Pinecone (Vector Database)

Role: Retriever of facts.

- Action: Performs similarity search over stored medical knowledge (based on embeddings).
- Value: Supplies the most relevant, trustworthy chunks of information for the LLM to use.

5. OpenAI GPT (Language Model)

Role: Reasoner and answer generator.

- Action:
- Reads the retrieved context from Pinecone.
- Synthesizes it into a clear, conversational medical response.
- Handles follow-up reasoning and phrasing.
- Value: Transforms raw knowledge into human-like answers.

6. Response to User

Role: Output stage.

- Action: Flask sends GPT's generated answer back to the frontend.
- Value: User receives a natural, instant response to their medical query.

DEPLOYMENT ON AWS

The screenshot shows the AWS EC2 Instances page. The left sidebar is collapsed. The main area displays one instance:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
medical-machi...	i-0bfc158eb3d9753ac	Running	t3.small	3/3 checks passed	View alarms	us-east-1b

Below the table, the instance details for **i-0bfc158eb3d9753ac (medical-machine)** are shown. The **Details** tab is selected. The instance summary table includes columns for Instance ID, Public IP/DNS address, and Private IP/DNS address.

The screenshot shows the Amazon ECR Private registry page. The left sidebar is collapsed. The main area displays one private repository:

Repository name	URI	Created at	Tag immutability	Encryption type
medicalbot	864624564673.dkr.ecr.us-east-1.amazonaws.com/medicalbot	August 25, 2025, 22:10:07 (UTC-04)	Mutable	AES-256

DEPLOYMENT ON AWS

Deploy Application Docker Image to EC2 instance

cicd added #1

Re-run all jobs ⋮

Summary

Triggered via push 19 minutes ago

Status: Success Total duration: 17m 58s Artifacts: -

aishwarya4699 pushed → b41fced main

cicd.yaml on: push

Continuous-Integration 8m 7s → Continuous-Deployment 9m 44s

Continuous-Integration

Continuous-Deployment

Run details

Usage

Workflow file

...

- +

Summary

Continuous-Integration succeeded 1 minute ago in 8m 7s

Search logs

Jobs

Continuous-Integration

Continuous-Deployment

Run details

Usage

Workflow file

Build, tag, and push image to Amazon ECR

436 e50008872522: Pushed
437 ae2d55769c5e: Pushed
438 b23fed0a7dbd: Pushed
439 e2ef8a813159d: Pushed
452 0f255a7254c8: Pushed
453 latest: digest: sha256:bc6922786ec54a2c0714f6fecb6b29deb4d09e22214d3b6ad38ecd5ad1a95b3f size: 2002
454 Warning: The 'set-output' command is deprecated and will be disabled soon. Please upgrade to using Environment Files. For more information see: https://github.blog/changelog/2022-10-17-github-actions-deprecating-save-state-and-set-output-commands/

Post Login to Amazon ECR

1 Post job cleanup.
2 Logging out of registry ***.dkr.ecr.***.amazonaws.com

Post Configure AWS credentials

1 Post job cleanup.

Post Checkout

1 Post job cleanup.
2 /usr/bin/git version
3 git version 2.51.0
4 Temporarily overriding HOME='/home/runn.../work/_temp/69b2f534-cc18-4c51-b23e-bd00630745bb' before making global git config changes
5 Adding repository directory to the temporary git global config as a safe directory
6 /usr/bin/git config --global --add safe.directory /home/runn.../work/AI-Healthcare-Chatbot/AI-Healthcare-Chatbot
7 /var/bin/git config --local --name-only --get-regexp core.sshCommand
8 /usr/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'core.sshCommand' && git config --local --unset-all 'core.sshCommand' || :"
9 /var/bin/git config --local --name-only --get-regexp http.https://github.com/.extraheader
10 http.https://github.com/.extraheader
11 /var/bin/git config --local --unset-all http.https://github.com/.extraheader
12 /var/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'http.https://github.com/.extraheader' && git config --local --unset-all 'http.https://github.com/.extraheader' || :"

Complete job

C2 > Security Groups > sg-06de4cd362f92ea5b - launch-wizard-1 > Edit inbound rules

Inbound rules	Info	Type	Info	Protocol	Port range	Source	Info	Description
sgr-009d91607d9f28286	SSH	TCP	22	C...	Q	0.0.0.0/0	X	Info
sgr-0d58b9d0a6c4011b5	HTTP	TCP	80	C...	Q	0.0.0.0/0	X	Info
sgr-03d6ba95da4655075	HTTPS	TCP	443	C...	Q	0.0.0.0/0	X	Info
-	Custom TCP	TCP	8080	A...	Q 0.0.0.0/0	0.0.0.0/0	X	Info

Add rule

RESULTS

The screenshot shows a web-based medical chatbot interface. At the top, there's a header bar with browser controls (back, forward, refresh), a lock icon, and the URL <http://54.204.164.44:8080>. Below the header is a dark-themed chat window. On the left, there's a yellow circular profile picture of a doctor with a stethoscope. To the right of the profile picture, the text "Medical Chatbot" is displayed in white, followed by "Ask me anything!" in a smaller font. In the center of the window, a blue speech bubble contains the bot's response: "Acne is a common skin disease characterized by pimples on the face, chest, and back. It occurs when the skin's pores become clogged with oil, dead skin cells, and bacteria. Acne vulgaris is the medical term for this condition." The timestamp "23:30" is visible at the bottom of this message. To the right of the message, there's a green speech bubble containing the user's question "what is acne" and a timestamp "23:30". On the far right edge of the window, there's a small blue circular icon with a white person symbol. At the bottom of the screen, there's a dark input field with the placeholder text "Type your message..." and a white arrow icon pointing upwards.

RESULTS

isotretinoin. It can be controlled by proper treatment, with improvement taking two or more months. Acne tends to reappear when treatment stops, but spontaneously improves over time. Inflammatory acne may leave scars that require further treatment.

Prevention

There are no sure ways to prevent acne, but the following steps may be taken to minimize flare-ups:

- gentle washing of affected areas once or twice every day
- avoid abrasive cleansers
- use noncomedogenic makeup and moisturizers
- shampoo often and wear hair off face
- eat a well-balanced diet, avoiding foods that trigger flare-ups
- unless told otherwise, give dry pimples a limited amount of sun exposure
- do not pick or squeeze blemishes
- reduce stress

Resources

BOOKS

Balch, James F., and Phyllis A. Balch. "The Disorders: Acne." In *Prescription for Nutritional Healing*, ed. Amy C. Beckenbach, et al. New York: Avery Publishing Group, 1997.

Bark, Joseph P. *Your Skin: An Owner's Guide*. Englewood Cliffs, NJ: Prentice Hall, 1993.

Goldstein, Sanford M., and Richard B. Odom. "Skin & Appendages: Pustular Disorders." In *Current Medical Diagnosis and Treatment*, 1996. 35th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1995.

Kapchuk, Ted J., Zev Rosenberg, and K'ian Herb Co., Inc. *K'ian Herbals: Formulas by Ted Kapchuk, O.M.D.* San Francisco: Andrew Miller, 1996.

PERIODICALS

"Adult Acne." *Harvard Women's Health Watch* (Mar. 1995): 4-5.

Bernfeld, Wilma E. "The Evaluation and Management of Acne:

ORGANIZATIONS

American Academy of Dermatology, 930 N. Meacham Road, P.O. Box 4014, Schaumburg, IL 60168-4014, (847) 330-0230. <<http://www.aad.org>>.

Mercedes McLaughlin

Acne rosacea see Rosacea

Acoustic neuroma see Acoustic neuroma

Acoustic neuroma

Acoustic neuroma

Definition

An acoustic neuroma is a benign tumor involving cells of the myelin sheath that surrounds the vestibulocochlear nerve (eighth cranial nerve).

Description

The vestibulocochlear nerve extends from the inner ear to the brain and is made up of a vestibular branch, often called the vestibular nerve, and a cochlear branch, called the cochlear nerve. The vestibular and cochlear nerves lie next to one another. They also run along side other cranial nerves. People possess two of each type of vestibulocochlear nerve, one that extends from the left ear and one that extends from the right ear.

The vestibular nerve transmits information concerning balance from the inner ear to the brain and the cochlear nerve transmits information about hearing. The vestibular nerve, like many nerves, is surrounded by a cover called a myelin sheath. A tumor, called a schwannoma, can sometimes develop from the cells of the myelin sheath. A tumor is an abnormal growth of tissue that results from the uncontrolled growth of cells. Acoustic neuromas are often called vestibular schwannomas because they are tumors

Medical Chatbot

Ask me anything!

Mercedes McLaughlin

how can I prevent acne?

23:48

To prevent acne, gently wash affected areas once or twice daily and use noncomedogenic makeup and moisturizers. Avoid abrasive cleansers and eat a well-balanced diet, avoiding foods that trigger flare-ups. Additionally, reduce stress, shampoo often, wear hair off your face, and do not pick or squeeze blemishes.

23:48

Type your message...

RESULTS

assess the levels of creatinine, blood urea nitrogen (BUN), uric acid, phosphate, sodium, and potassium. The kidney regulates these agents in the blood. Urine samples will also be collected, usually over a 24-hour period, to assess protein loss and/or creatinine clearance.

Determining the cause of kidney failure is critical to proper treatment. A full assessment of the kidneys is necessary to determine if the underlying disease is treatable and if the kidney failure is chronic or acute. X rays, magnetic resonance imaging (MRI), computed tomography scan (CT), ultrasound, renal biopsy, and/or arteriogram of the kidneys may be used to determine the cause of kidney failure and level of remaining kidney function. X rays and ultrasound of the bladder and/or ureters may also be needed.

Treatment

Treatment for acute kidney failure varies. Treatment is directed to the underlying, primary medical condition that has triggered kidney failure. Prerenal conditions may be treated with replacement fluids given through a vein, diuretics, blood transfusion, or medications. Postrenal conditions and intrarenal conditions may require surgery and/or medication.

Frequently, patients in acute kidney failure require hemodialysis, hemofiltration, or peritoneal dialysis to filter fluids and wastes from the bloodstream until the primary medical condition can be controlled.

Hemodialysis

Hemodialysis involves circulating the patient's blood outside of the body through an extracorporeal circuit (ECC), or dialysis circuit. The ECC is made up of plastic blood tubing, a filter known as a dialyzer (or artificial kidney), and a dialysis machine that monitors and maintains blood flow and administers dialysate. Dialysate is a sterile chemical solution that is used to draw waste products out of the blood. The patient's blood leaves the body through the vein and travels through the ECC and the dialyzer, where fluid removal takes place.

During dialysis, waste products in the bloodstream are carried out of the body. At the same time, electrolytes and other chemicals are added to the blood. The purified, chemically-balanced blood is then returned to the body.

Creatinine—A protein produced by muscle that healthy kidneys filter out.
Extracorporeal—Outside of, or unrelated to, the body.
Ischemia—A lack of blood supply to an organ or tissue.
Nephrotoxic—Toxic, or damaging, to the kidney.
Radiocontrast agents—Dyes administered to a patient for the purposes of a radiologic study.
Sepsis—A bacterial infection of the bloodstream.
Vasopressors—Medications that constrict the blood vessels.

Medical Chatbot
Ask me anything!

what is the treatment for kidney failure? 23:55

The treatment for kidney failure varies based on the underlying cause. For acute kidney failure, it involves addressing the primary medical condition that triggered the failure, which may include fluid replacement for prerenal conditions. In cases of chronic kidney failure or end-stage renal disease, long-term dialysis or kidney transplantation is required to replace lost renal function. 23:55

Type your message... 

RESULTS

Acrocyanosis is a temporary and persistent skin rash. The main concern of patients is cosmetic. Left untreated, the disease does not worsen.

Resources

BOOKS

Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill, 1998.
Berkow, Robert, ed. *Merck Manual of Medical Information*. Whitehouse Station, NJ: Merck Research Laboratories, 1997.
Larsen, D. E., ed. *Mayo Clinic Family Health Book*. New York: William Morrow and Co., Inc., 1996.

John T. Loehr, PhD

Acromegaly and gigantism

Definition

Acromegaly is a disorder in which the abnormal release of a particular chemical from the pituitary gland in the brain causes increased growth in bone and soft tissue, as well as a variety of other disturbances throughout the body. This chemical released from the pituitary gland is called growth hormone (GH). The body's ability to

32

GALE ENCYCLOPEDIA OF MEDICINE 2

- heavy sweating
- oily skin
- increased coarse body hair



Acromegaly

Medical Chatbot

Ask me anything!

what is Acromegaly and gigantism?

23:49

Acromegaly is a disorder caused by the abnormal release of a chemical from the pituitary gland leading to increased growth in bone and soft tissue, along with various other bodily disturbances. When this abnormality occurs before bone growth has stopped, it results in gigantism, characterized by unusual height. Acromegaly is relatively rare, affecting approximately 50 out of every one million people, often diagnosed in middle-aged individuals due to gradually appearing symptoms.

Type your message...





THANK YOU



aishwarya-pramod.vercel.app



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