

Conversational Information Seeking: Theory and Application



#TheCISTutorial

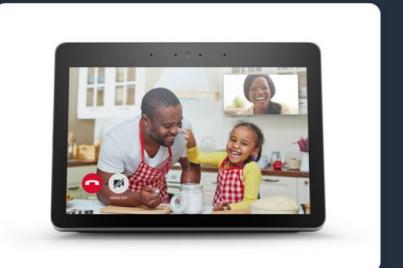
Practical Session Part 2
Open Assistant Toolkit



UoG GRILLBot

Winner of 2021-22 Alexa Prize Taskbot Challenge

https://grilllab.ai/2022-05-15-alexa_taskbot_win/



alexa



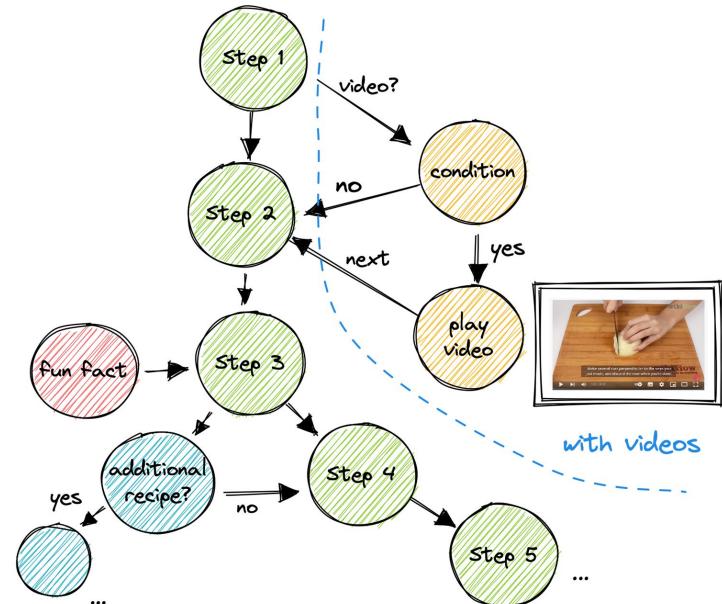
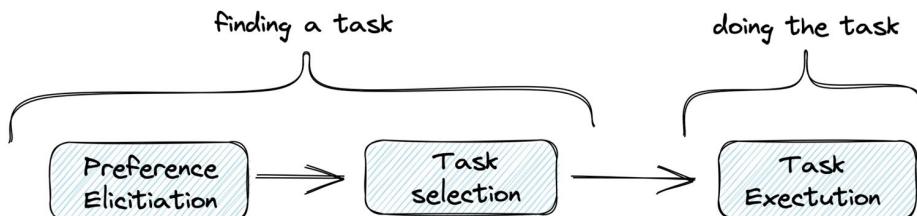
2



OAT - Open Assistant Toolkit

What? A domain-agnostic framework for conversational system research

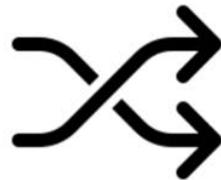
Who? Allows researchers to easily develop and evaluate conversational systems



OAT task walkthrough

Key Features of OAT

Flexible



adaptable policies &
architecture

Multimodal



supporting
images & videos

Open



released models &
data sources

Toolkit



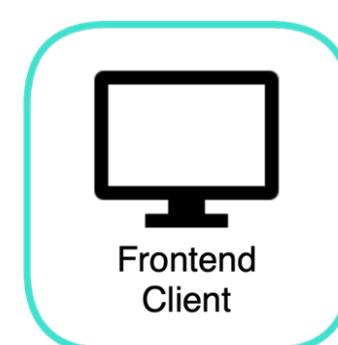
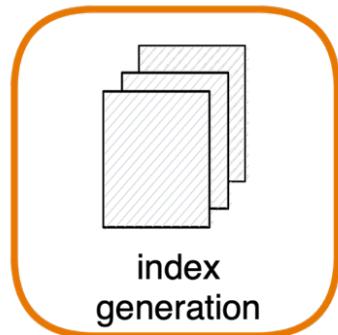
cloud deployment &
inspection tools

Hands-On Tasks Overview

Prep



Tasks



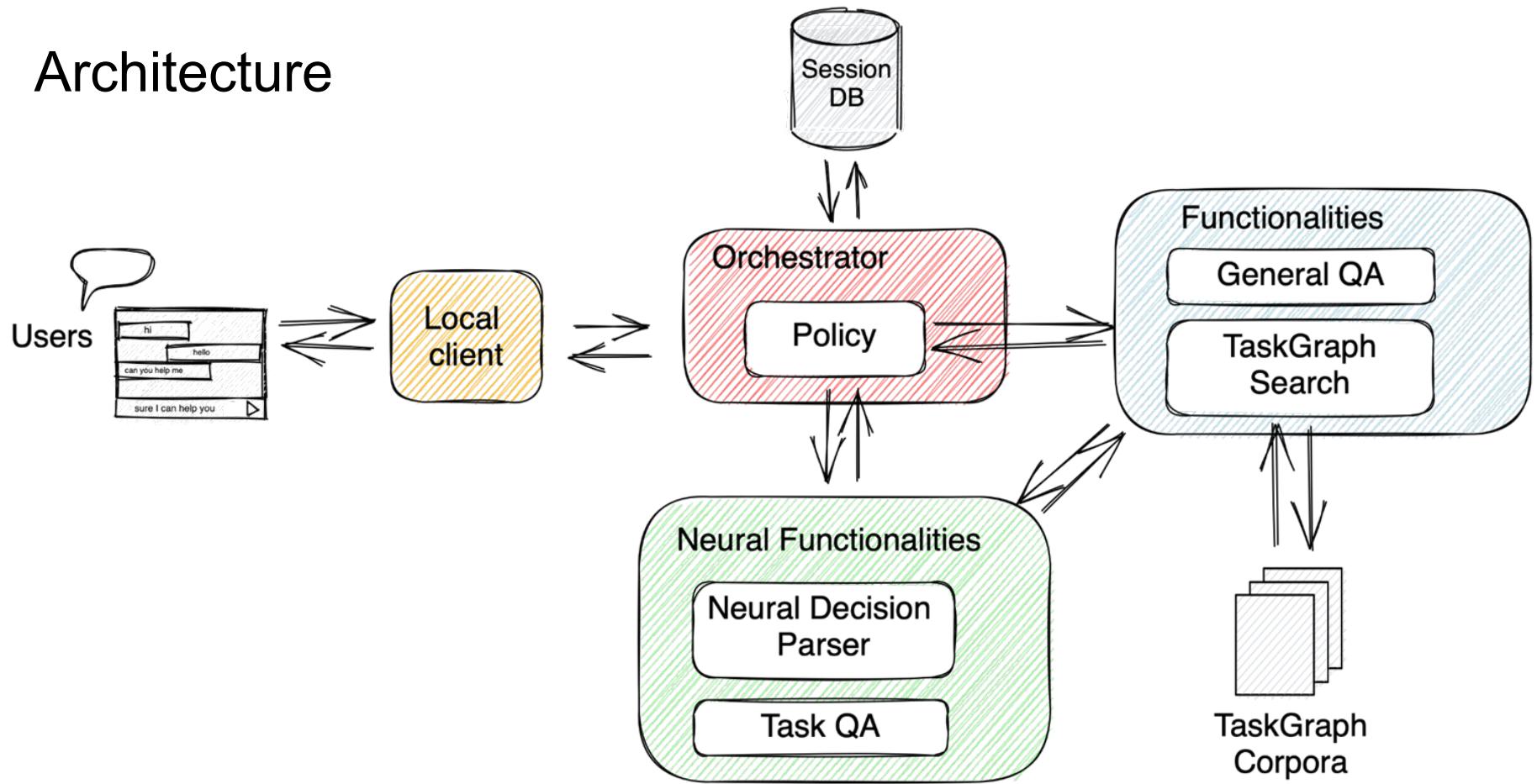
Running the system

- Confirm docker containers are running correctly →

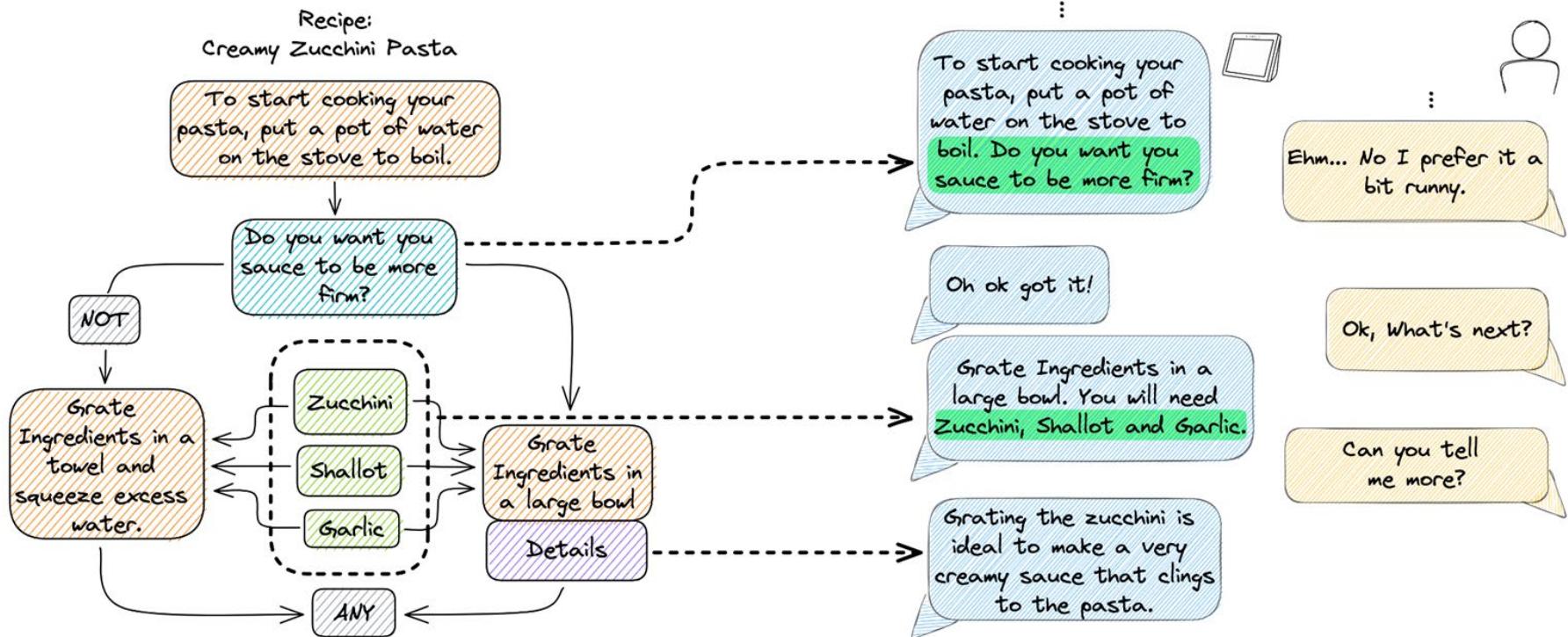
```
InternalGRILL — docker-compose - docker compose up --build — 92x39

Downloading: 100%|██████████| 605/605 [00:00<00:00, 1.13MB/s]
Downloading: 100%|██████████| 294M/294M [03:08<00:00, 1.63MB/s]
Downloading: 100%|██████████| 2.02k/2.02k [00:00<00:00, 2.66MB/s]
Downloading: 100%|██████████| 773k/773k [00:01<00:00, 545kB/s]
Downloading: 100%|██████████| 1.74k/1.74k [00:00<00:00, 2.29MB/s]
Downloading: 100%|██████████| 605/605 [00:00<00:00, 1.03MB/s]
neural_functionalities | [2022-07-06 14:01:39,282] - INFO - local.neural_functionalities
- __init__:29 - Loaded General QA model
neural_functionalities | [2022-07-06 14:01:39,290] - INFO - local.neural_functionalities
- __init__:52 - loading and computing intent embeddings
Batches: 100%|██████████| 10/10 [00:01<00:00, 8.38it/s]
neural_functionalities | [2022-07-06 14:01:49,912] - INFO - local.neural_functionalities
- __init__:65 - loading RnD intent classifier
Downloading: 100%|██████████| 25.0/25.0 [00:00<00:00, 11.8kB/s]
Downloading: 100%|██████████| 1.21k/1.21k [00:00<00:00, 1.75MB/s]
Downloading: 100%|██████████| 773k/773k [00:01<00:00, 401kB/s]
Downloading: 100%|██████████| 1.74k/1.74k [00:00<00:00, 1.90MB/s]
neural_functionalities | [2022-07-06 14:03:45,804] - INFO - local.neural_functionalities
- __init__:72 - loading question type classifier
neural_functionalities | [2022-07-06 14:04:00,206] - INFO - local.neural_functionalities
- __init__:79 - Loaded RnD UnifiedQA intent parsing model from: /shared/file_system/models/policy_classification/UQA_intent_model_1185
neural_functionalities | [2022-07-06 14:04:00,209] - INFO - local.neural_functionalities
- __init__:18 - loading sBERT model
neural_functionalities | [2022-07-06 14:04:15,112] - INFO - local.neural_functionalities
- __init__:20 - loading sBERT tokenizer
neural_functionalities | [2022-07-06 14:04:19,410] - INFO - local.neural_functionalities
- __init__:23 - sBERT is Loaded!!!
neural_functionalities | [2022-07-06 14:04:26,441] - INFO - local.neural_functionalities
- __generate_embeddings:35 - Computing query embeddings for Themes...
external_functionalities | [2022-07-06 14:04:26,477] - INFO - local.external_functionalities
s - wrapper:27 - TIMEIT: scan_ids took 0.0000 s
neural_functionalities | [2022-07-06 14:04:26,640] - INFO - local.neural_functionalities
- __generate_embeddings:39 - No Theme Queries
neural_functionalities | [2022-07-06 14:04:33,677] - INFO - local.neural_functionalities
- __init__:25 - computing video embeddings
Batches: 100%|██████████| 23/23 [00:02<00:00, 8.27it/s]
neural_functionalities | [2022-07-06 14:04:56,385] - INFO - local.neural_functionalities
- serve:68 - Finished loading all models
```

Architecture

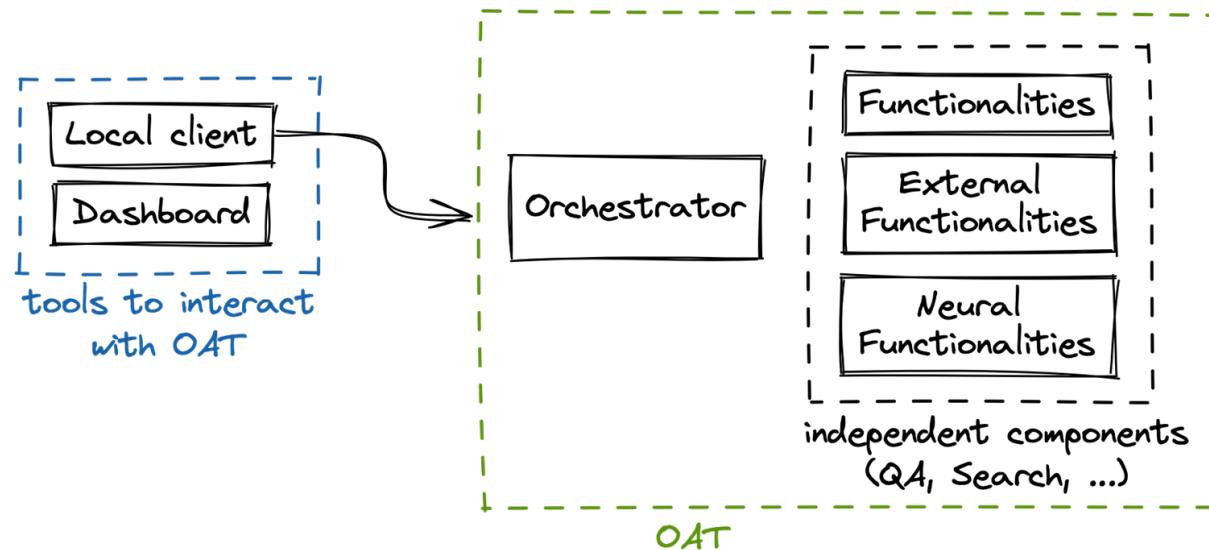


Task Graphs: a live example



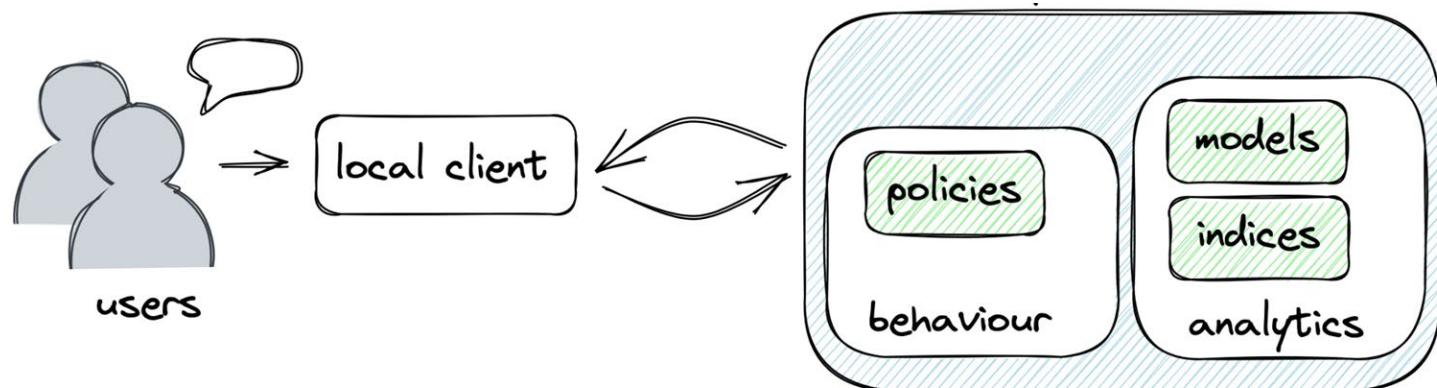
Task 0 - Running the system

- Microservice architecture:
 - *Local client*
 - *Orchestrator*
 - *Functionalities*
 - *External functionalities*
 - *Neural functionalities*



Local Client

- This is a conversational interface that interacts with OAT
- Researchers can replace with any front-end client



Open <http://127.0.0.1:9000/> in your browser

Local Client

Open Assistant Toolkit Dev. Chat

Baking With Dorie
Ann Brettingen's Swedish Apple Cake Recipe by Dorie Greenspan
Which would you like?

User: cancel

BOT: I can help with cooking and home improvement
What would you like to make?

User: pizza bufalina

BOT: So, for "pizza bufalina", I found three great matches

First is
Outdoor Pizza Oven 'Nduja Pizza by Andrew Janjigian

Second is
Pizza With Hot Soppressata, Mozzarella, Chilies, and Honey Recipe by J Kenji López-Alt

And, third
Outdoor Pizza Oven Charred Broccoli Rabe and Anchovy Pizza by Andrew Janjigian

You can also select a result if you'd like
Which would you like?

User: 2

BOT: Here is the summary of the task
Do you want to see the ingredients?

User: show ingredients

BOT: Before we get started, please be careful when using any tools or equipment
Do you want to start?

User: Start

BOT: Got it
So you're aware, you can ask me to repeat, go back, or say the next step
If you'd like, I can also give you more details about a step, or remind you of the things you'll need for this recipe
So, for Step 1 out of 7
Divide dough into four equal parts and place each in a covered quart-sized deli container or a zipper-lock freezer bag
Allow to rest at room temperature for at least 2 hours before baking
Transfer tomatoes to a medium bowl and roughly crush by hand
Season to taste with salt and set aside.

User: How much flour do I need?

BOT: Great question! I don't know the answer but I don't want that to slow us down
I'm really keen to keep going!

User: next step

BOT: Step 2

Adjust oven rack to 6 inches under broiler and place stone or steel on rack
Preheat oven to highest possible temperature (500 or 550°F) for at least 45 minutes
Alternatively, use a KettlePizza and Baking Steel grill insert.

Say something nice

Send

Step 2

I understood: "next step"

Requirements:

- baking stone or Baking Steel (see note)

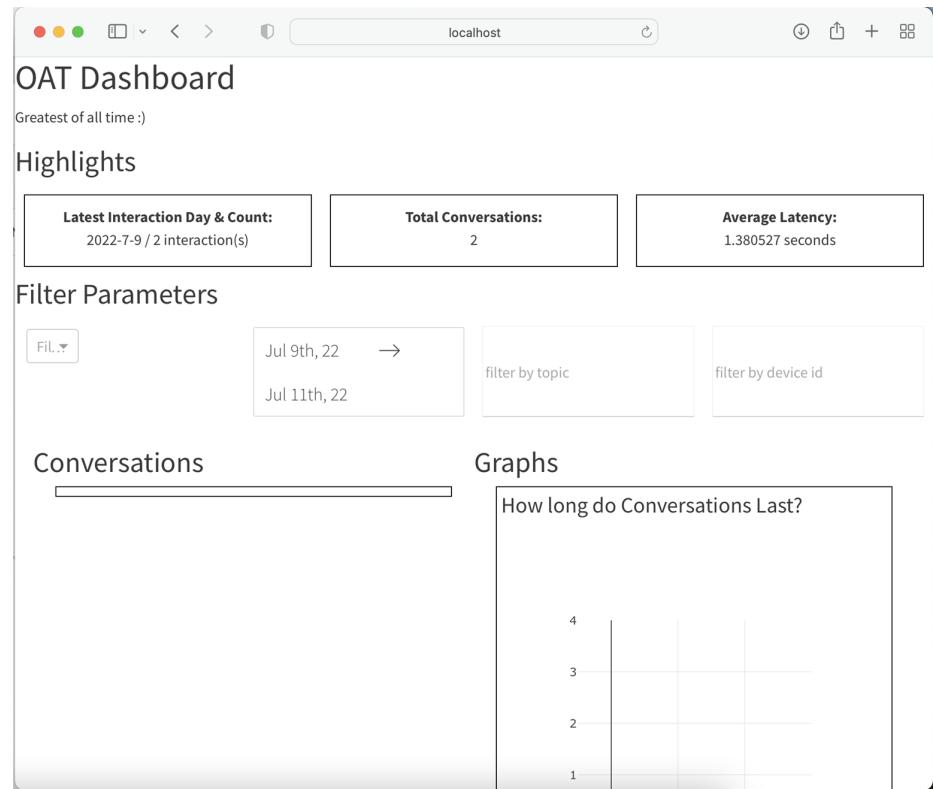
Hint: Say "Hint: Ask about specific ingredients"

[Previous](#) [Next](#)

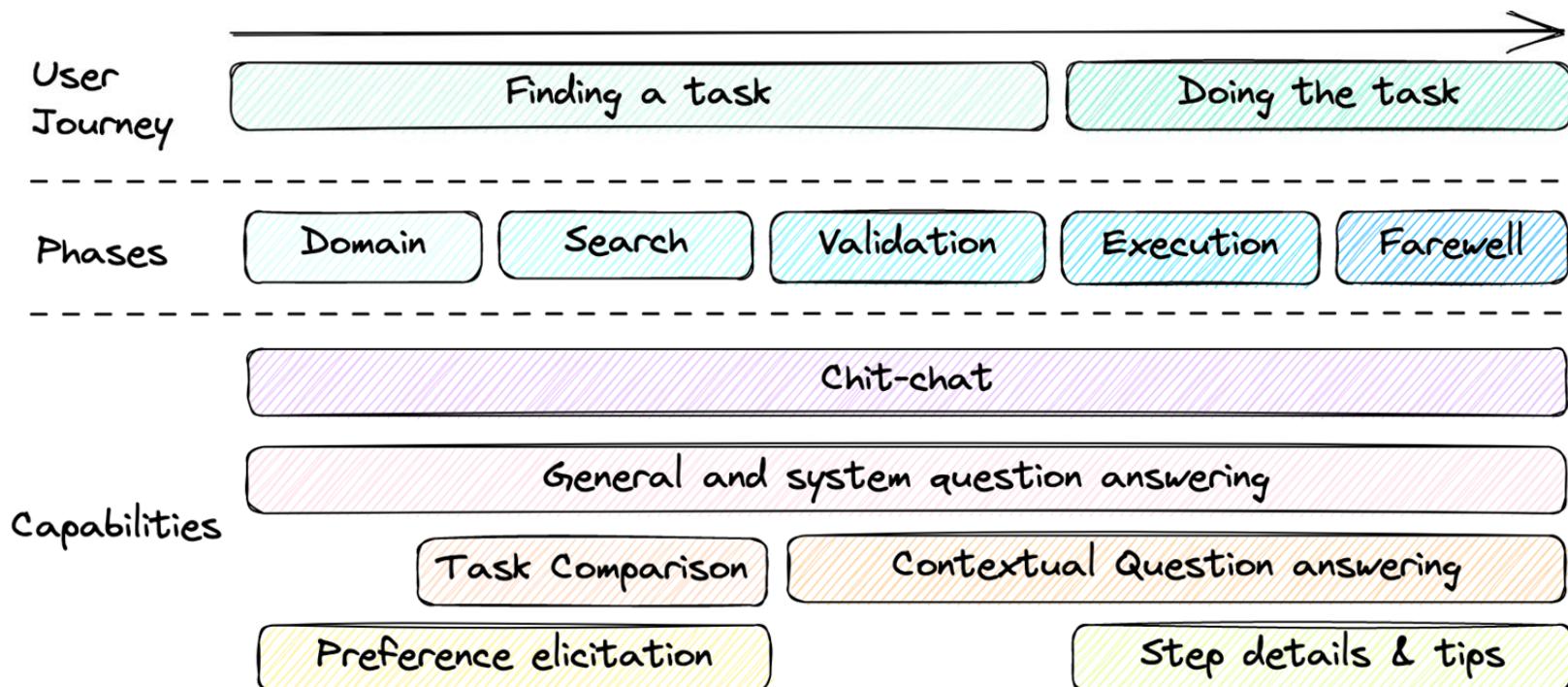


Dashboard

- Analyse conversation history using the dashboard
- Build dashboard docker container
 - ***Open new terminal*
 - *> docker compose build dashboard*
- Go to <http://localhost:7500>



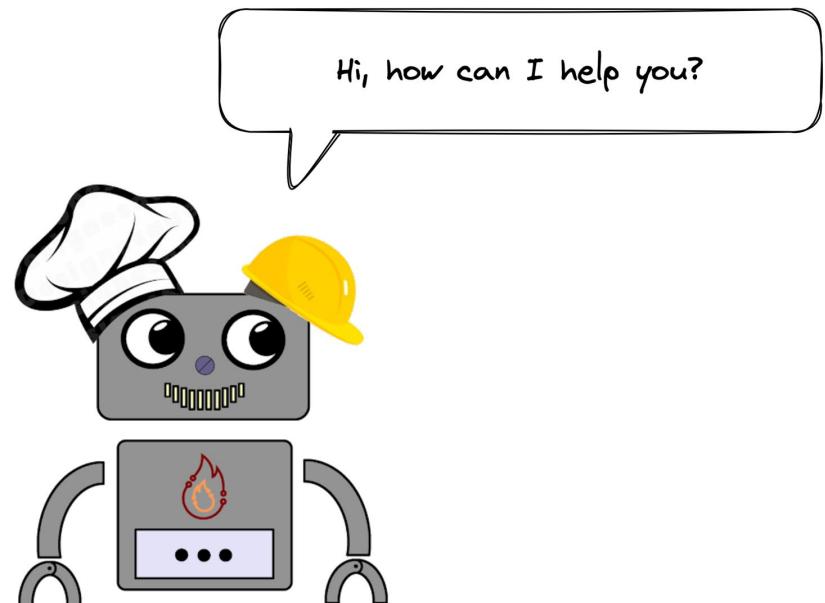
Conversation flow: A phased approach



Task 1 - Prompt Changes

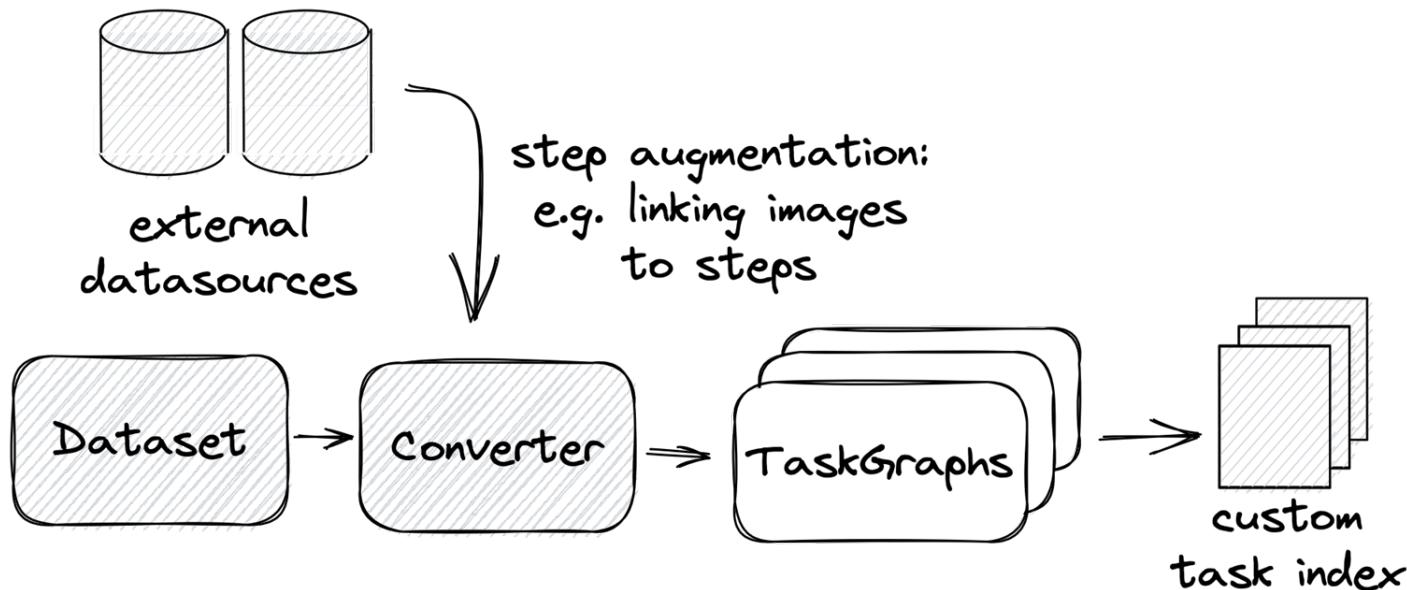
Defining the agent's personality

- Prompt definitions split into conversation phases:
shared/utils/constants/prompts.py
- Your Task: Change greeting to be funny, add a joke, system capabilities ...

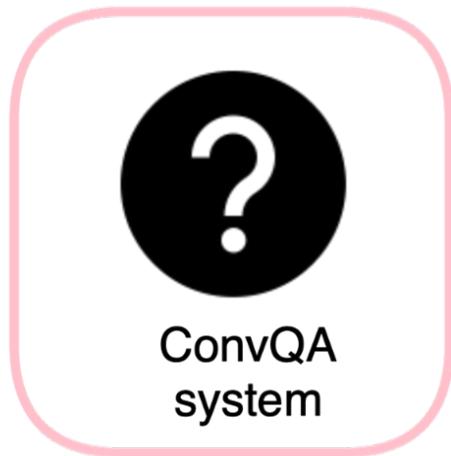


Task 2 - Index Generation

- Generating a TaskGraph index from downloaded custom dataset
- Generation pipeline configurable in taskmap_generation/config.py file: each dataset has its own config



Advanced Tasks



ConvQA
system

Task 3



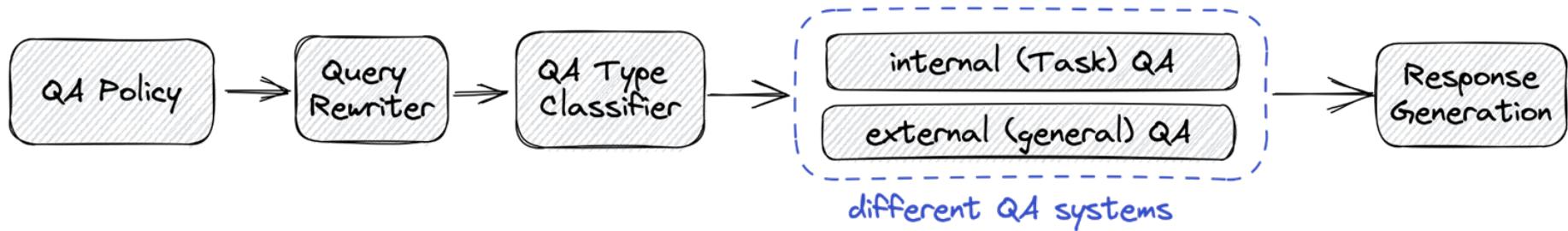
Frontend
Client

Task 4

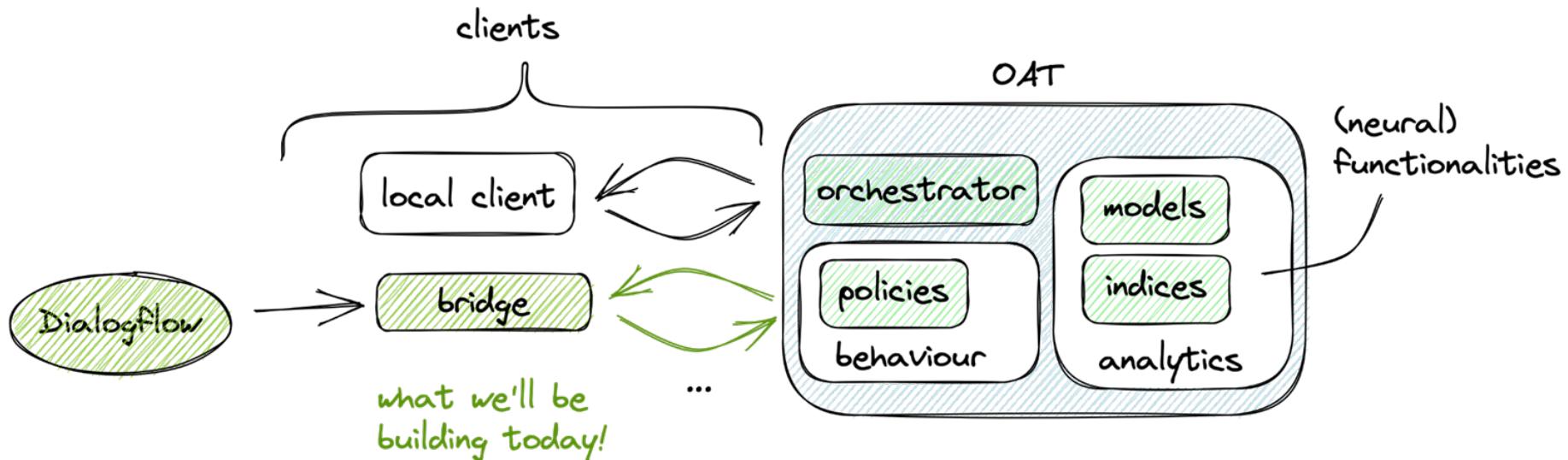
Choose your own adventure!

Task 3 - Link an existing ConvQA system

- Two QA systems provided for OAT
 - External QA: T5 small model trained on natural questions
 - Internal QA: SQuAD model - generate answers about current task
- Both defined as a gRPC microservices



Task 4 - Adding a new front-end client in Google Dialogflow



README guide: <https://github.com/grill-lab/OAT/blob/main/doc/dialogflow.md>

Conclusion

You've been the first people to use and deploy OAT in the wild.
Thanks for your help!



You are on your way to an Alexa-prize worthy conversational agent!

