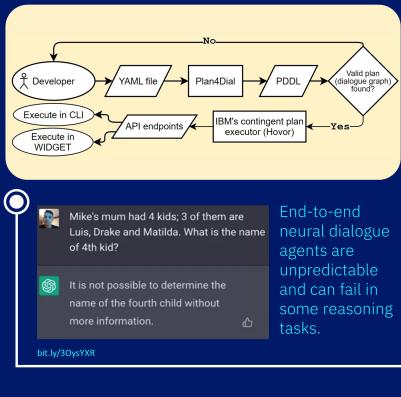


PLAN4DIAL

Dialogue Planning Framework



Mike's mum had 4 kids; 3 of them are Luis, Drake and Matilda. What is the name of 4th kid?

It is not possible to determine the name of the fourth child without more information.

End-to-end neural dialogue agents are unpredictable and can fail in some reasoning tasks.

```

actions:
  get-have-allergy:
    type: dialogue
    message_variants:
      - Do you have any allergies?
    condition:
      have_allergy:
        known: false
    effect:
      set-allergy:
        onefor:
          outcomes:
            indicate_allergy:
              updates:
                have_allergy:
                  value: true
                  known: true
                intent: confirm
                follow_up: get-allergy
            indicate_no_allergy:
              updates:
                have_allergy:
                  known: true
                  value: false
                conflict:
                  known: true
                  value: false
                intent: deny
  context_variables:
    # user's location
    location:
      type: json
      execution:
        method: spacy
        config_method: gpe
      known:
        type: flag
        init: false
      options:
        Toronto:
          variations:
            - downtown
        Kingston:
          variations:
            - k-town
        # doesn't user have an allergy?
        have_allergy:
          type: flag
          init: false
          known:
            type: flag
            init: false
            known:
              type: flag
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```

PLAN4DIAL offers the creation of complex dialogue planning agents through a YAML spec...

```

nlu:
  - examples: '- yes
    - yeah
    - that's it
    - y
    - ahm
    - confirm
    - yes please'
  - intent: phone
  - examples: '- I'd like to know your phone number.
  - examples: '- I live in [downtown]['entity': 'location', 'value': 'Toronto'].
  - I am located in [downtown]['entity': 'location', 'value': 'Toronto'].
  - I am located in [Kingston]['entity': 'location', 'value': 'Kingston'].
  - I live in [k-town]['entity': 'location', 'value': 'Kingston'].
  - I am located in [Kingston]['entity': 'location', 'value': 'Kingston'].
  - Can you help me find things to do in [downtown]['entity': 'location', 'value': 'Toronto']?
  - I live in [Kingston]['entity': 'location', 'value': 'Kingston'].
  - I live in [Toronto]['entity': 'location', 'value': 'Toronto'].
  - Can you help me find things to do in [Toronto]['entity': 'location', 'value': 'Toronto']?
  - Can you help me find things to do in [Kingston]['entity': 'location', 'value': 'Kingston']?
  - I live in [Kingston]['entity': 'location', 'value': 'Kingston'].
  - Can you help me find things to do in [k-town]['entity': 'location', 'value': 'Kingston']?
  - I am located in [Kingston]['entity': 'location', 'value': 'Kingston'].
  - intent: share_location

```

MACHINE-GENERATED



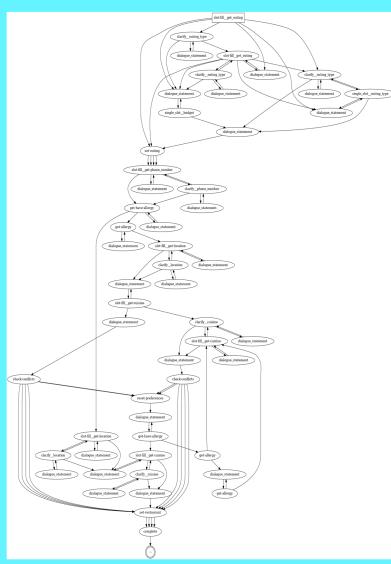
```

(:action get-have-allergy
:parameters()
:precondition
  (and
    (not (forcing_get-allergy))(not (know_have_allergy))
    (not (force-statement)))
  )
:effect
  (labeled-oneof get-have-allergy_set-allergy
    (outcome indicate_allergy
      (and
        (forcing_get-allergy)
        (know_have_allergy)(have_allergy)
      )
    )
    (outcome indicate_no_allergy
      (and
        (know_conflict)(not (conflict))
        (know_have_allergy)(not (have_allergy))
      )
    )
    (outcome fallback (and (force-statement)))
  )
)

```

...which it uses to train an NLU model and generate PDDL (followed by its planner-generated graph). These are then passed to Hovor for chat execution.

Rebecca De Venezia, Christian Muise
Contact 18rldv@queensu.ca



Dialogue planning uses FOND planning to generate dialogue graphs from PDDL, ensuring fully-explainable agents.

Dialogue planning has proven to be effective for creating predictable, task-oriented chatbots, but no readily available modern framework exists. We propose such a framework along with "WIDGET", an embeddable web UI.

Our approach leverages both symbolic and neural AI by using planning for dialogue navigation and an NLU model for extracting user information.



Other Features

Custom action templates, outcome determination, and entity extraction



Results output to API endpoints for your own use



Conversation saving



Full dockerization

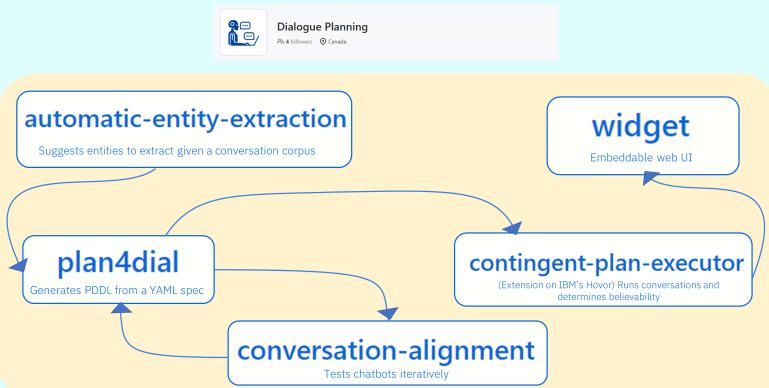
/new-conversation

GET:

Begins a new conversation. Returns the agent's message(s) under "msg" and the user's id under "user_id". Be sure to store the "user_id" so you can load your conversation later!

Our Vision

With Plan4DIAL as the foundation, we aim to grow into a centralized hub for exploring advancements in dialogue planning. The diagram below displays the execution ordering of our existing systems, with many more to join!



github.com/dialogue-planning

CONTRIBUTE