
The NLPragbot Integrated System

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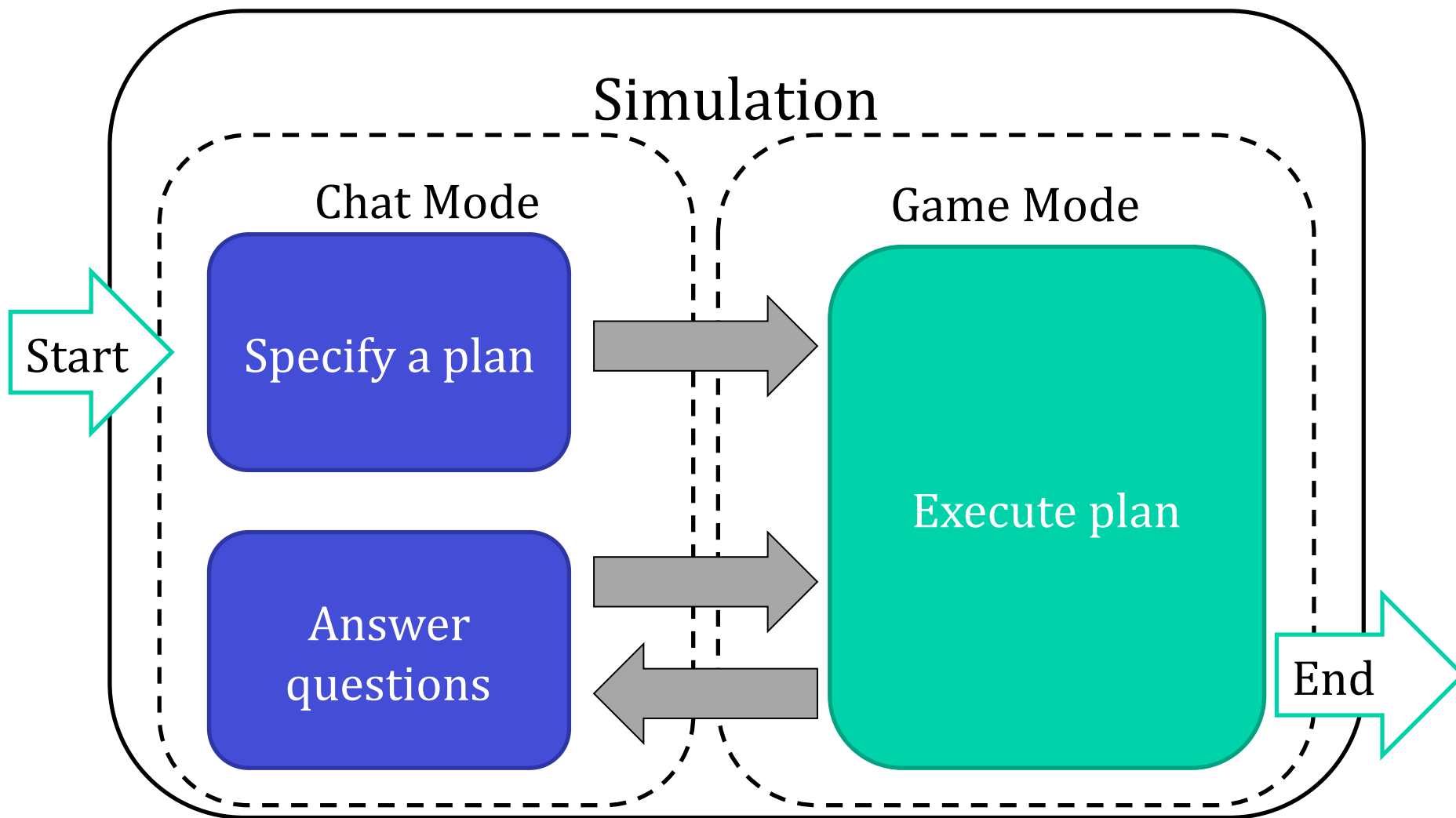
Goals of the integrated system

- **Give a basic end-to-end demo of the current software components in the project**
- **Demonstrate the following:**
 - Specifying a plan using natural language
 - Naturally answering questions about the robot's state
 - Visualization of the controller being executed and interacting with the simulated robot
- **Provide a software structure for more detailed development**

Integrated system agents

- **Commander (user)**
 - Describes a plan to Junior using simple, natural language
 - Helps Junior complete the plan by rescuing Junior if needed
- **Junior (simulated robot)**
 - Processes the natural language plan from the commander into simple semantic propositions for a search MetaPAR
 - Translate the MetaPAR into LTL
 - Create an automaton from the LTL
 - Execute the automaton, communicating with the commander as instructed and answering any questions

Simulation design



Specifying a plan

Commander's instructions

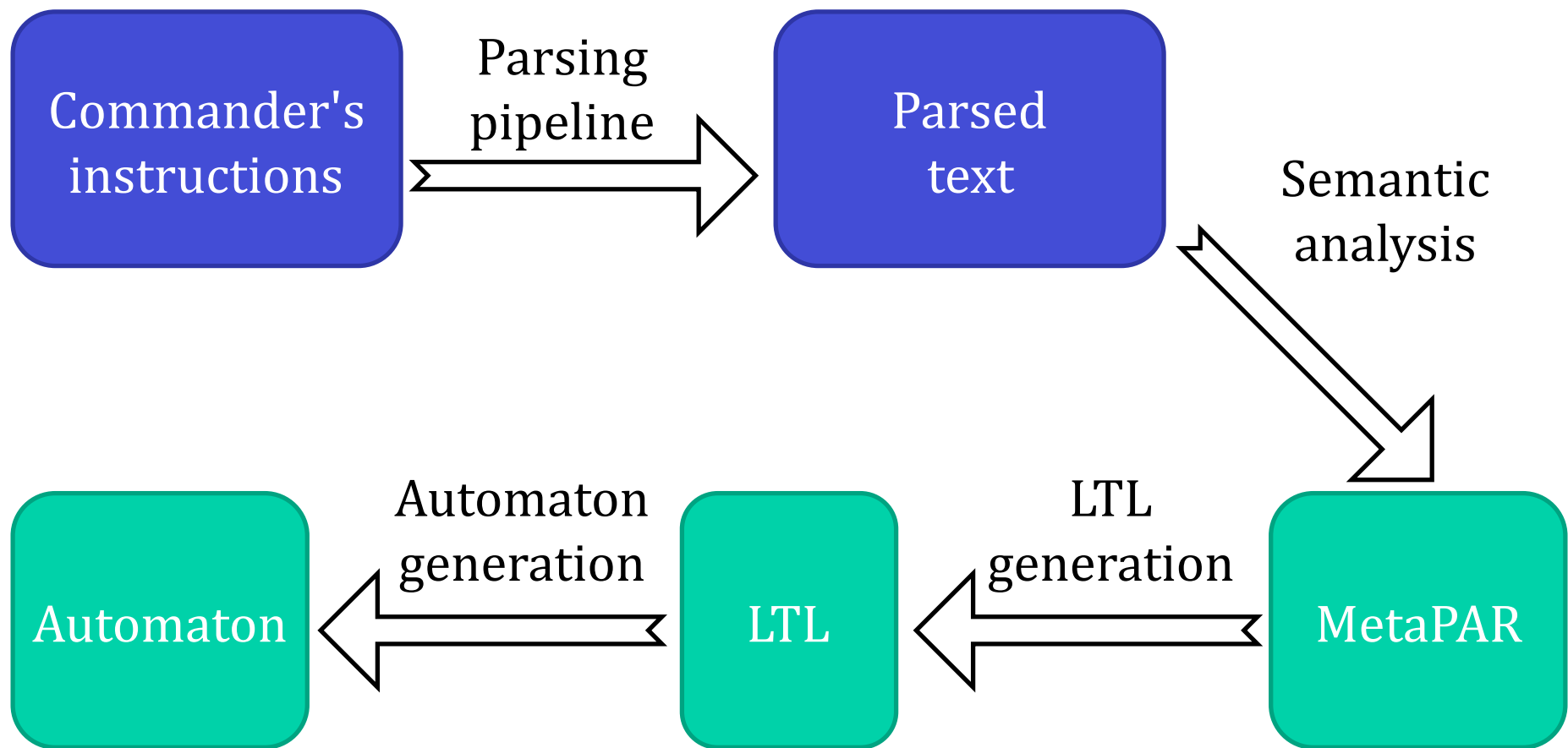
Parsed sentences

MetaPAR

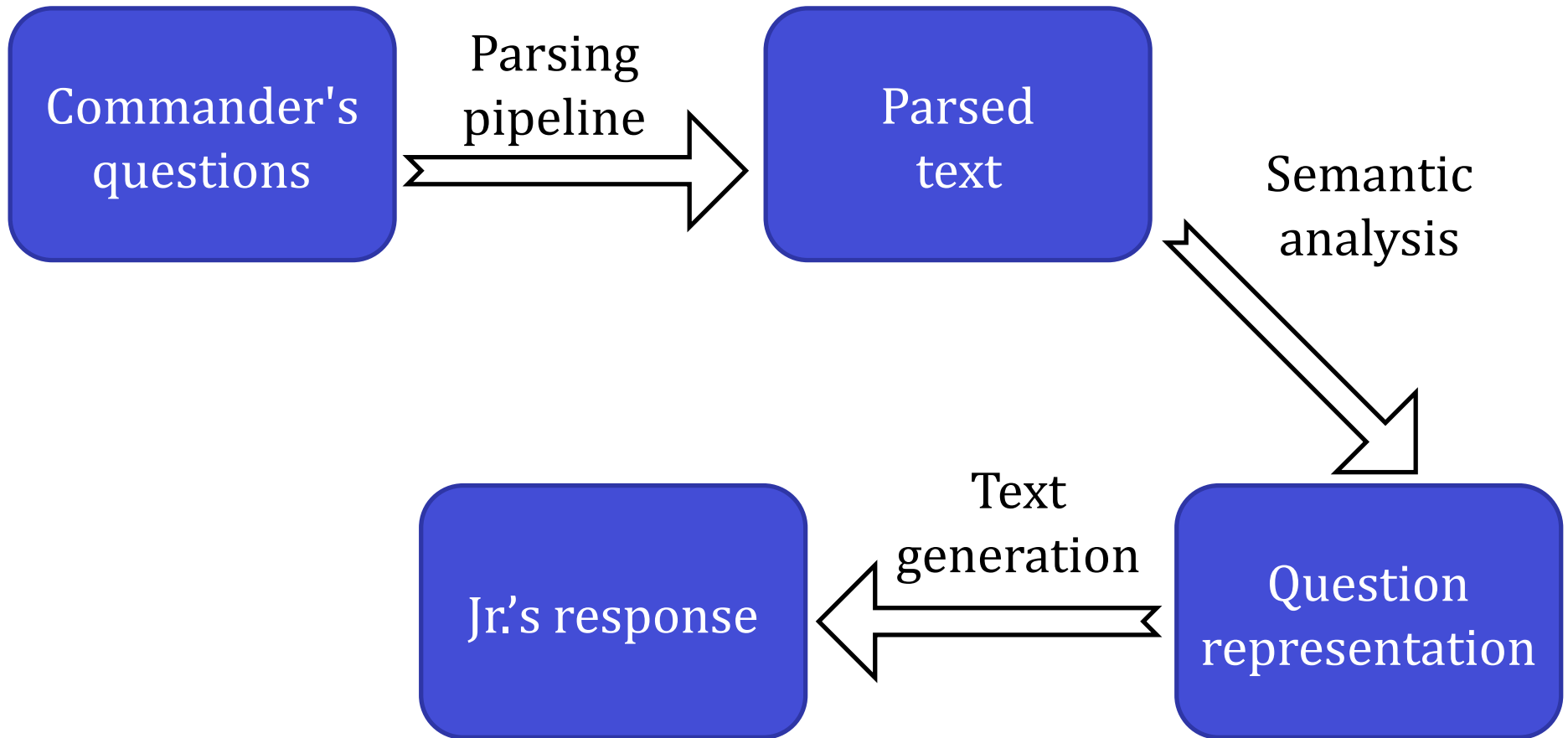
LTL

Automaton

Specifying a plan



Answering questions



Components of NLPragbot

- **Simulation**
 - Responsible for simulation and visualization
 - Produces and executes automaton from received LTL
 - Sends commander's input to NLBot
 - Sends automaton state to NLBot so it can respond to state changes ("Help, I'm flipped!") and answer questions
- **NLBot**
 - Responsible for connecting all natural language components
 - Tokenization, tagging, parsing, semantic analysis, text generation
 - Produces LTL from commander's instructions
 - Sends responses to commander's questions to the simulation

Text Generation- Qiuye (Sophie) Zhao

- **Task: Let Jr. respond**
 - Situation 1: got flipped, discover a hostage...
 - Situation 2: a question is raised by CMD
- **Solution: A standard NLP solution**
 - Data collection and annotation (see next page)
 - Learning from the data
 - Generation (not in any interesting way, though)
 - Decoding

Data collection and generation

- **Original data**

Player 1, 305068: ok, I'm righted
Player 2, 314968: okay, carry on counterclockwise, outside loop
Player 1, 322089: ok
Player 1, 323273: follow me
Player 2, 338760: that's the idea, i just can't see you. so report in after each room
Player 1, 346687: ok
Player 1, 390551: i'm in the eastern room in the north hall
Player 1, 400772: i just walked into a room and diffused a bomb
Player 1, 409637: but a terrorist walked in and flipped me
Player 2, 411105: so you went clockwise?
Player 1, 418692: there is one hostage
Player 1, 422019: yup
Player 1, 429336: bad robot
Player 2, 439632: haha, okay rebel. since you got the bomb ill be over in a minute
Player 1, 448910: thanks
Player 1, 515332: ok

- **Annotated data**

- JRHOSTAGES:0: all hostages rescued
- JRHOSTAGES:1: there is a hostage in the room
- JRBOMBS:1: there is a bomb in the room
- JRHOSTAGES:1: this room has a hostage in it
- JRBOMBS:0: there is no bomb here.
- JRBOMBS:0: all bombs are destroyed
- JRHOSTAGES:xxx: xxx hostages here.
- JRBOMBS:xxx: xxx bombs in the room.
- JRFLIPPED:0: I am not flipped, so I will clear the next room
- JRFLIPPED:1: I am flipped. Now, do what you are paid for, CMD.
- JRROOM:1: the northwest corner room in the east wing
- JRROOM:1: the bottom left room.
- JRROOM:9: lower left room in the east wing
- JRROOM:15: the first room on the left at the east hallway
- JRROOM:14: the room closest to the exit on the left
- JRROOM:15: the room closest to the door (east)

Thanks!