AI Agent for Task Automation: Fix the Code

Nirjhar & Vardhan

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Outline

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Given a repository containing bugs, our goal is to:

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- Identify and locate the buggy file(s) based on the bug description
- Suggest and implement corrected version(s) of the buggy file(s)

Example

```
Bug -
Title - Resolve Loader Exception for valid pdf files.
Description - When I uploaded a valid file, loader process throws
exception with the message that can't read an empty file.
Actual Behavior: The file should be processed as it is not an empty
file and the chatbot should appear without throwing any exception.
```

What are LLMs?

- Advanced AI models trained on vast text data
- Understand and generate human-like language
- Perform tasks such as:
  - Text generation
  - Translation
  - Summarization
  - Code generation
- Examples:
  - OpenAI's GPT series
  - Google's BERT
  - Meta's LLaMA

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- Examples:
  - Article Generating System: Planner agent, Writer agent, Editor agent
  - Automatic Mailing System: Web Scraping agent, Email Drafting agent, Email Reviewing agent, Automatic Email Sending agent

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1. Analyze dependencies and relationships between files to understand how they interact.
2. Identify the buggy file(s) related to the issue, based on the provided description.
3. Use AI agents to fix the identified buggy files, considering any related dependencies.

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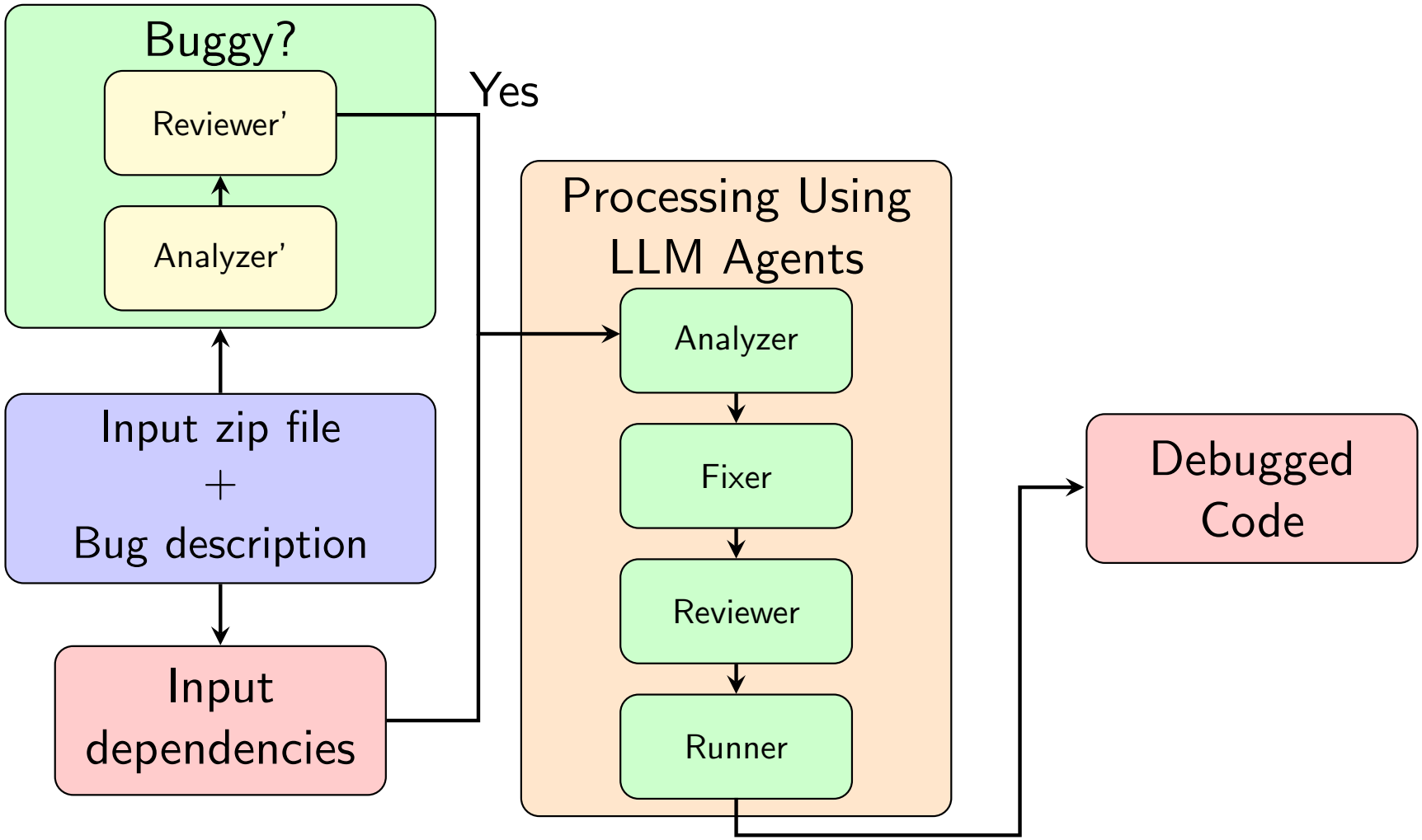
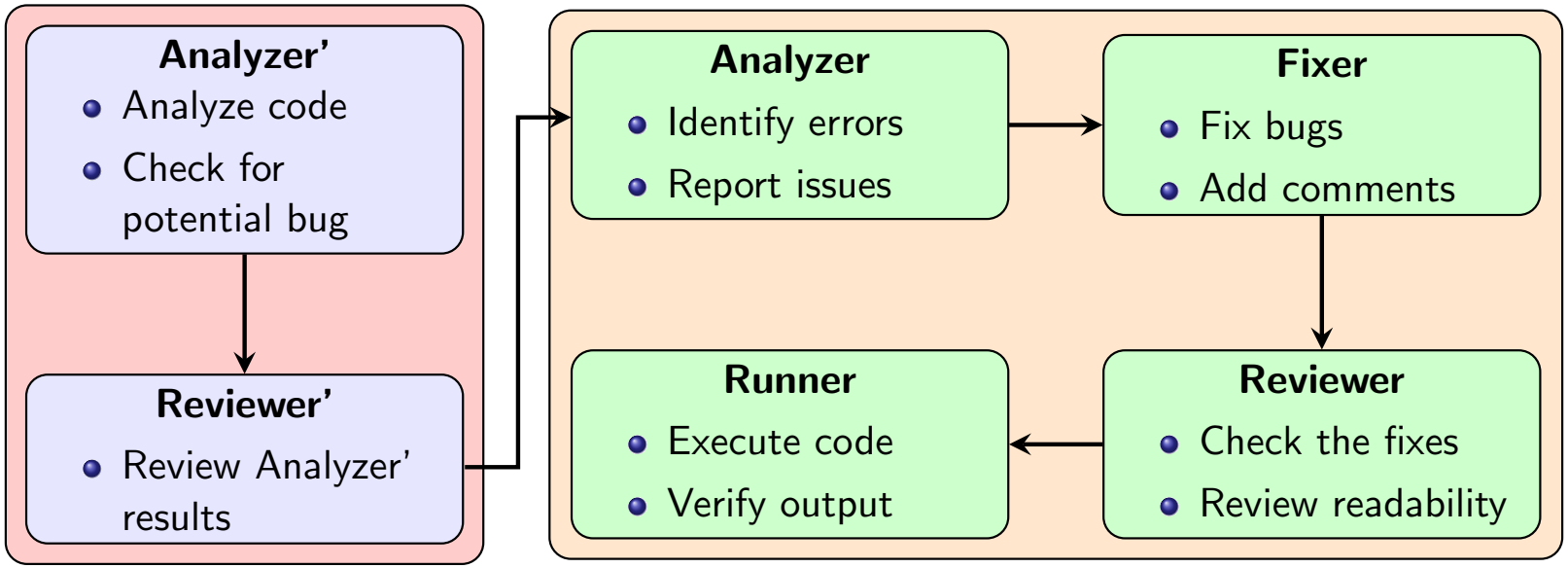
- **Key Functions:**
  - Analyzes code to locate buggy files using AI-based code inspection.
  - Generates fixes for the identified issues, ensuring the solution is effective and doesn't introduce new problems.

Implementation flowchart



Workflow of Agents



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- **Bug Detection:**
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- **Fix Process:** Once identified, the system generates corrected code and provides an explanation for the changes.

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  - Bug description from the user
  - Repository in ZIP format, containing the codebase
  - Dependencies in JSON format, detailing file relationships
- **Outputs:**
  - List of probable buggy files based on the analysis
  - Fixed code for those files, accompanied by explanations to help users understand the changes made

References

1. OpenAI's GPT: https://chat.openai.com/
2. CrewAI: https://www.crewai.com/
3. Prompt Engineering: https://www.promptingguide.ai/

Thank you!