ScummVM Enhancement Proposal

Video Link: https://youtu.be/Fe-leXQ3yCA?si=0UIKGLCv6umJ72lw

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Team Members:

- Arianne Nantel (Team Lead, Participated in research, reviewed report, wrote SEI SAAM analysis, abstract and conclusion)
- Kyra Salmon (Participated in research, reviewed and structured report, wrote introduction, Black Box implementations, and cited sources)
- Andrew Clawson (Participated in research, reviewed report, wrote white box implementation/ external interfaces, worked on sequence diagrams)
- Daniel Dousek (“I did white box :) “)
- Arda Utku (Presentation, participated in research, worked on SCI SAAM analysis for Black-Box approach, worked on sequence diagrams and example use case)
- Oliver Macnaughton (Presentation, participated in research, worked on Black-Box approach implementation, example use case for one of the sequence diagrams)

Presentation Overview

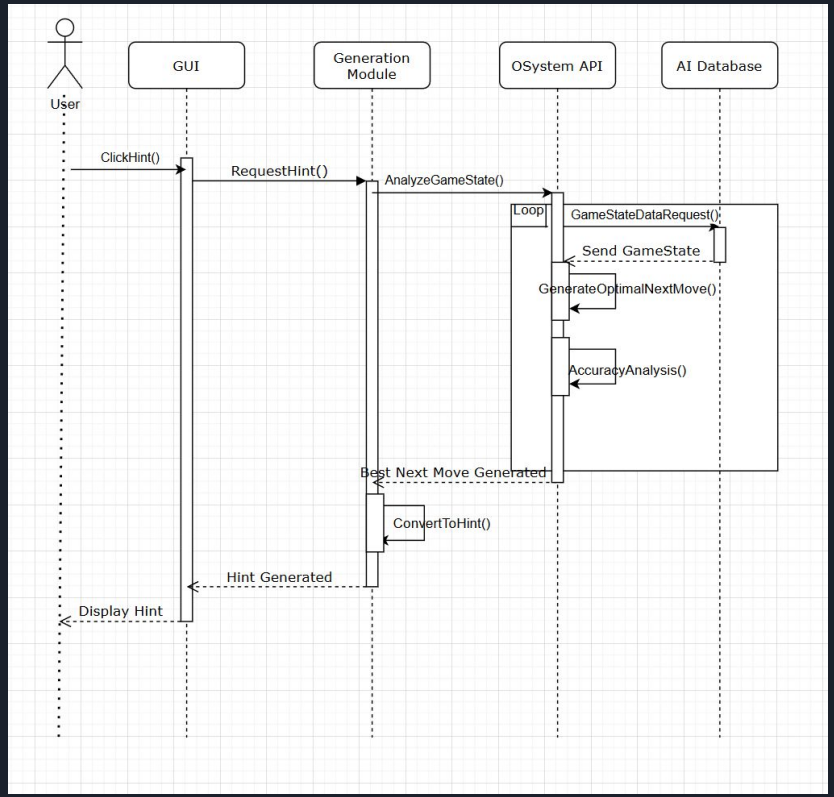
- ScummAI Companion Overview
- White-Box vs Black-Box proposal for the enhancement
- White-Box vs Black-Box implementation for the enhancement
- SEI SAAM analysis
- Comparison between implementations
- Conclusions

Companion Overview

- AI companion that provides in-game textual hints to progress the player's GameState
- Two proposed implementations:
  - Black-Box: Trained through recorded frame analysis
  - White-Box: Trained through game code analysis

Black-Box Proposal and Implementation

- Companion trained on gameplay footage through Reinforcement Learning
- Uses recorded frame analysis to derive textual hints based on perceived goal state
- Pros:
  - Modular implementation
- Cons:
  - Long training process
  - Human error in training data



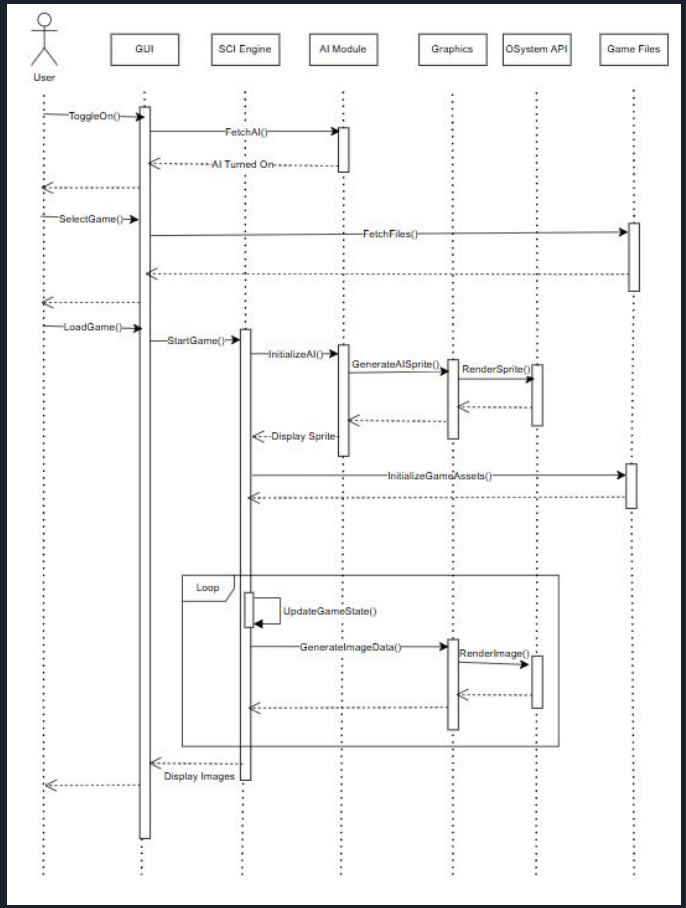
White-Box Proposal and Implementation

- Two new components:
  - AI Companion Component
  - Hook Observations Component
- Layers modified:
  - Engine
  - GUI
  - Graphics
- Overall goal:
  - AI understands current GameState and future steps and is able to provide helpful hints to the player

SEI SAAM Analysis

Identifying the major stakeholders of the proposed enhancement:

- End-User Players:
  - Useful to players
  - Provides assistance without spoiling the game
- Project Leadership Team:
  - Preserve the nostalgia of the games
  - Per game discussion on the implications of the implementation
- Documentation Team:
  - Ensure AI is simple and easily documentable for improved maintenance
- Developers:
  - Responsible for implementation
  - Split into several teams to delegate responsibilities
  - Utilize various testing methods



SEI SAAM Analysis

Identifying, for each stakeholder, the most important non-functional requirements (NFRs) regarding the enhancement:

- End-User:
  - Performance
- Developers:
  - Modifiability
- Project Leadership Team:
  - Accuracy
- Documentation Team:
  - Maintainability

Which Implementation?

- Black-Box
  - Pros: Modular Implementation, Only interacts with GUI, Graphics, and OSystem API layers
  - Cons: long training process, human error
- White-Box
  - Pros: higher hint helpfulness accuracy
  - Cons: difficult implementation hurdles, not interfering with game play, interacts with all layers of system

Conclusion

Key Takeaways:

- Black box vs white box proposal for ScummVM AI companion
- Different implementations to achieve same result
- SEI SAAM analysis to determine feasibility of proposed approaches

Thank you For Listening