Immersive Voice Interaction for Real-Time Tactics Games

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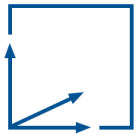

- Final: Bachelor Informatics: Games Engineering
- Supervisor: Prof. Gudrun Klinker, Ph.D.

Motivation

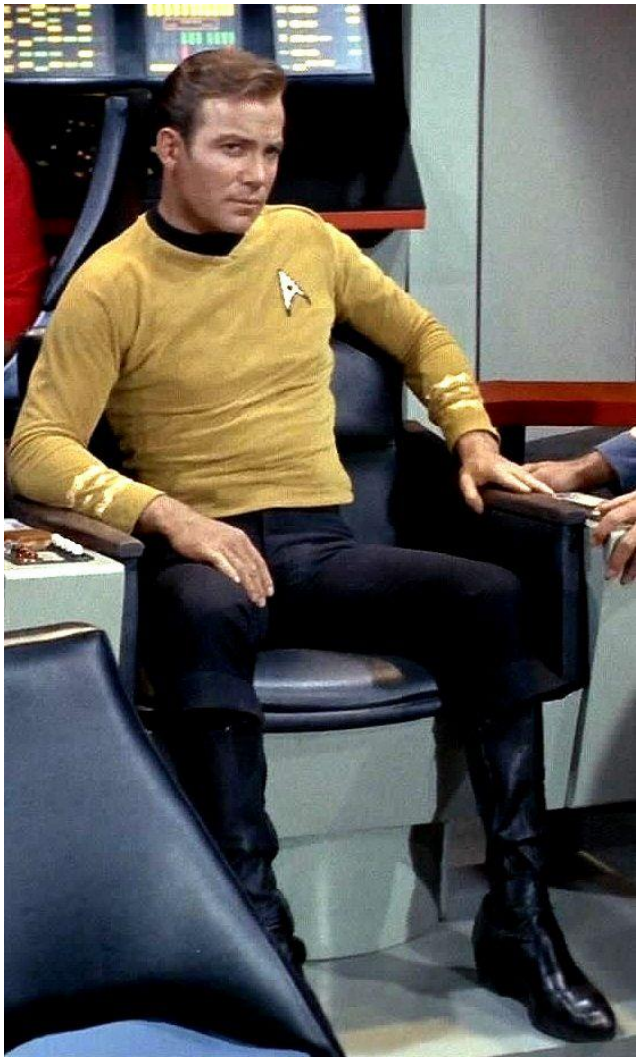

Image 1: Captain Kirk from Star Trek

Motivation

Image 2: Siri

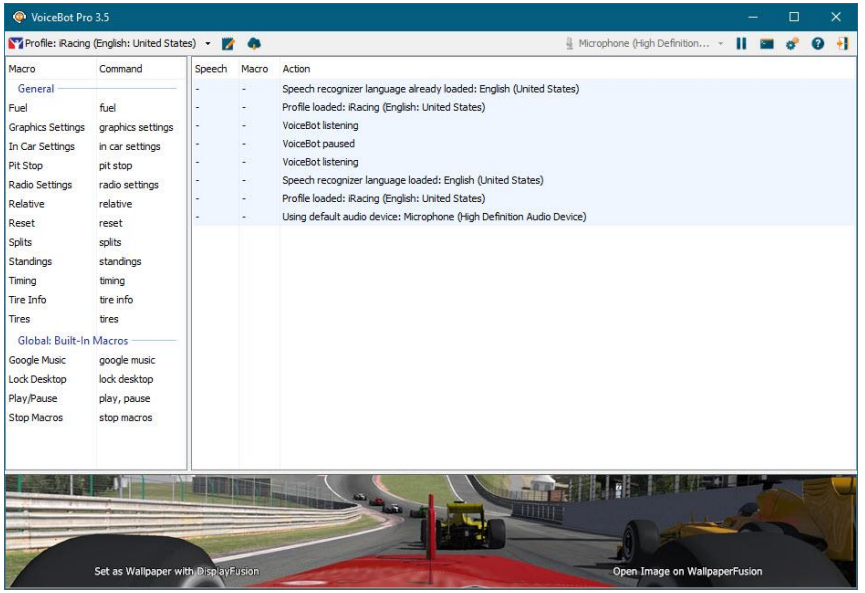

Image 3: VoiceBot

Issues

Image 4

Issues

- Different sentences with same meaning
- Context-dependend sentences
- Unclear pronounciation or low-level microphones
- Limited array of implemented commands
- Embarassement [1]
- Delayed feedback (see [2, p. 135])

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Existing Solution

Improving speech-recognition software

Goals of this Thesis

- Finding game design-based solutions for speech-recognition problems

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- Finding game design-based solutions for speech-recognition problems
- Applying and reformulating common (game design) patterns and guidelines for voice-controlled games
- Using speech-recognition in order to achieve a high immersion during gameplay

→ Providing a prototype in the form of a (real-time tactics) game

Related Work

- “Frame analysis of voice interaction gameplay” by Allison et al. [1]
- “Design patterns for voice interaction in games” by Allison et al. [3]

Used Guidelines

- **Game Design:** Jesse Schell [4]
- **3D user interfaces:** LaViola et al. [5]
- **Usability, UI:** Jakob Nielsen, Donald Norman et al. [2, 6, 7]
- **Immersion barriers:** Emily Brown and Paul Cairns [8]
- **Immersion:** Ernest Adams [9]
- **Immersive HUD:** Erik Fagerholt and Magnus Lorentzon [10]

Applying a guideline: Example 1

Allison et al. [3]: Four patterns for diegetic framing

- Speak as a character
- Speak as a player
- Situated commander
- Floating commander

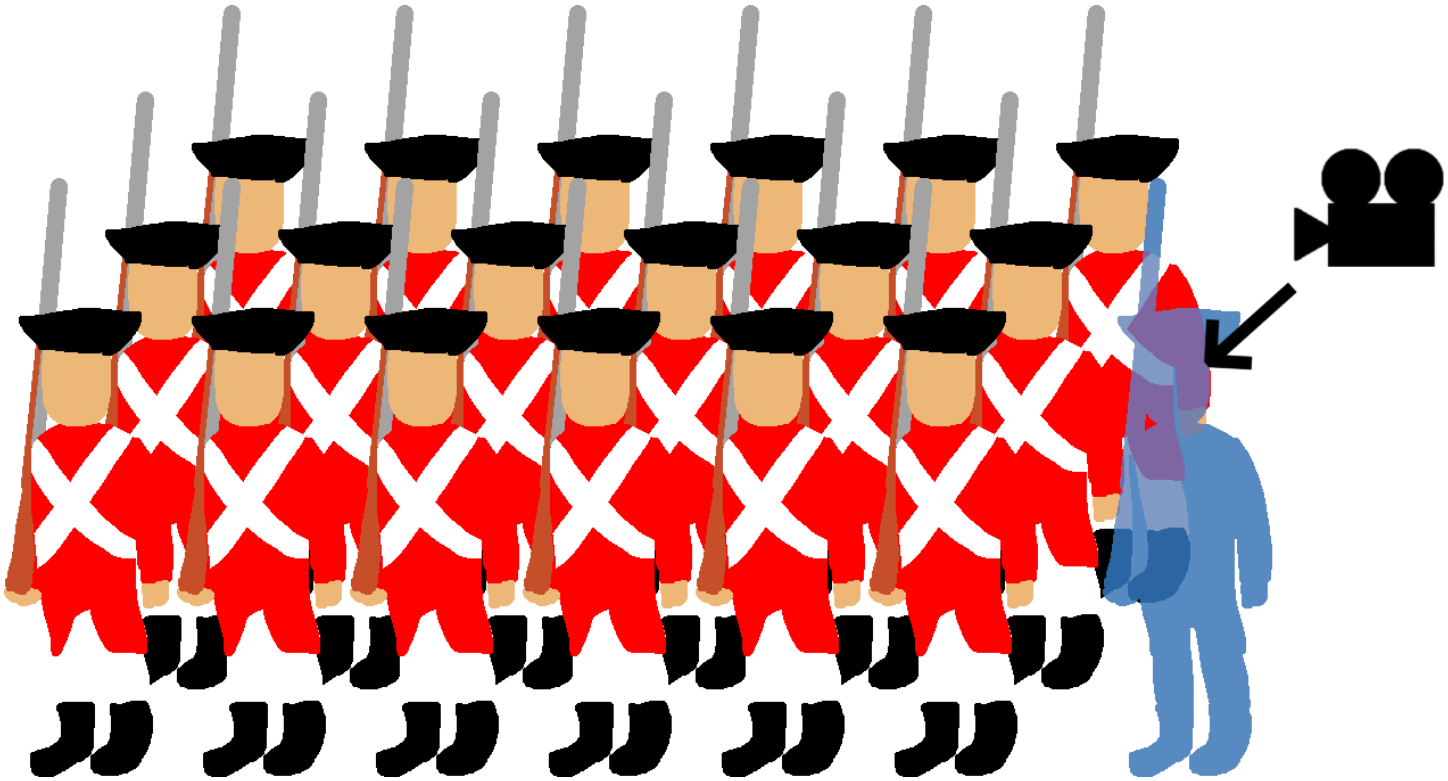
Applying a guideline: Example 1

Image 5: Mount & Blade II: Bannerlord

Applying a guideline: Example 1

Total War: Three Kingdoms

Applying a guideline: Example 1



Applying a guideline: Example 1

Allison et al. [3]: Four patterns for diegetic framing

- Speak as a character
- Speak as a player
- Situated commander
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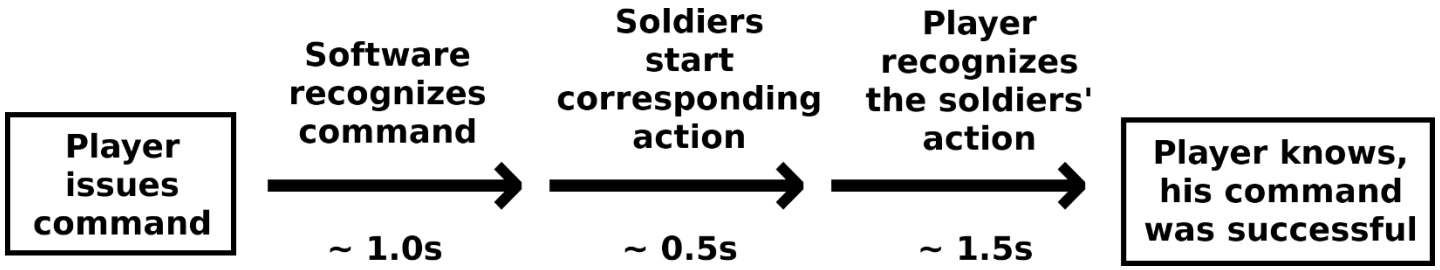
- ✓ Restricting unnecessary movement in 3D-space → LaViola et al. [5, Sec. 7.11 Design Guidelines]
- ✓ Avoiding distractions → Schell [4, p. 145], Allison et al. [3, p. 9]
- ✓ Creating the “experience of an embodied persona as the imagined source of the players voice” [3, p. 9]

Violating a guideline: Example 2

J. Nielsen - Response Time [2, p. 135]:

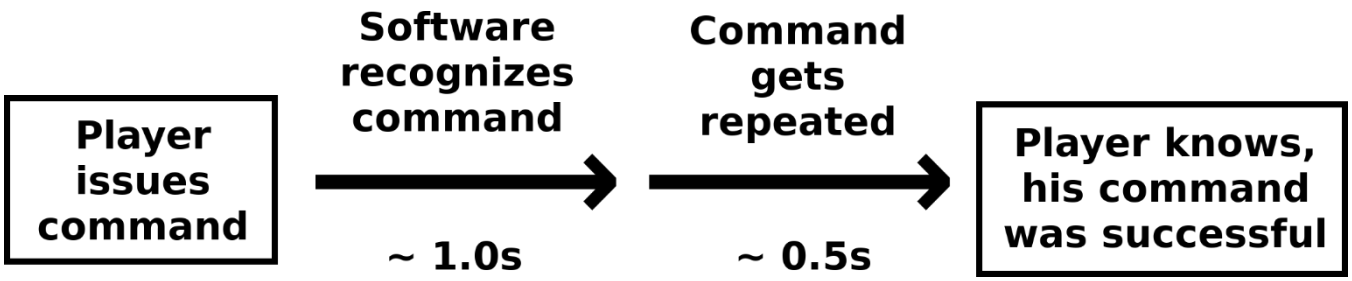
- ≤ **0.1 second:** Instantaneous response
- ≤ **1.0 second:** Uninterrupted flow of thought
- ≤ **10 seconds:** Keep the user‘s attention focused

Violating a guideline: Example 2



Violating a guideline: Example 2

Workaround: An invisible sergeant



Demonstration of gameplay footage

https://www.youtube.com/watch?v=8vgKT-EvEik

Issues – solved?

- ✓ Different sentences with same meaning
- ✓ Context-dependend sentences
- ✓ Unclear pronounciation or low-level microphones
- ✓ Limited array of implemented commands
- ✓ Embarassement
- ✓ Delayed feedback

Issues – solved?

- ✓ (Different sentences with same meaning)
- ✓ (Context-dependend sentences)
- ✓ Unclear pronounciation or low-level microphones
- ✓ Limited array of implemented commands
- ✓ Embarassement
- ✓ Delayed feedback

Conclusion

This thesis and the prototype demonstrate, how…

- **chopped off and unnatural commands** (due to the speech recognition software) can still be utilized in an **immersive** context
- most of the **guiding design principles could be applied** in the context of a voice-controlled game
- a **mix between a floating and situated commander** can improve the immersion while not distracting from commanding as the core mechanic of the game

Thank you for your attention!

List of References

1. F. Allison, J. Newn, W. Smith, M. Carter, and M. Gibbs. “Frame analysis of voice interaction gameplay.” In: *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 2019, pp. 1–14.
2. J. Nielsen. *Usability engineering*. Morgan Kaufmann, 1994.
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6. J. Nielsen and R. L. Mack. *Usability Inspection Methods*. John Wiley & Sons, New York, NY, USA, 1994.
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9. E. Adams. *Fundamentals of game design*. Pearson Education, 2014.
10. E. Fagerholt and M. Lorentzon. “Beyond the HUD-user interfaces for increased player immersion in FPS games.” MA thesis. 2009.

List of Images

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