Carnegie Mellon University Africa

Behavior Trees for Culturally Sensitive Social Robots: African Culture Case Study

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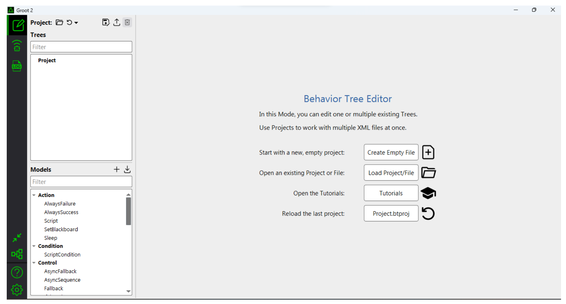
Overview

The goal of this project is to explore the use Behavior Trees to implement robot missions for a culturally sensitive social robot in Africa.

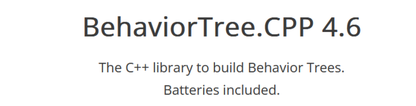
Cultural sensitivity in social robots' interaction is essential for fostering trust, ensuring respectful interactions, and enhancing user experiences. However, developing robots that can dynamically adapt to different cultural norms presents significant challenges.

Behavior Trees (BTs) were invented as a tool to enable modular AI in computer games but have received an increasing amount of attention in the robotics community in the last decade. Compared to other approaches, such as hierarchical finite state machines, they have clear advantages in terms of modularity, reusability or expandability. By developing a comprehensive and up-to-date cultural knowledge database and integrating these cultural norms into behavior trees and enabling dynamic adaptation, robots can achieve a higher level of cultural competence.

Frameworks and Tools

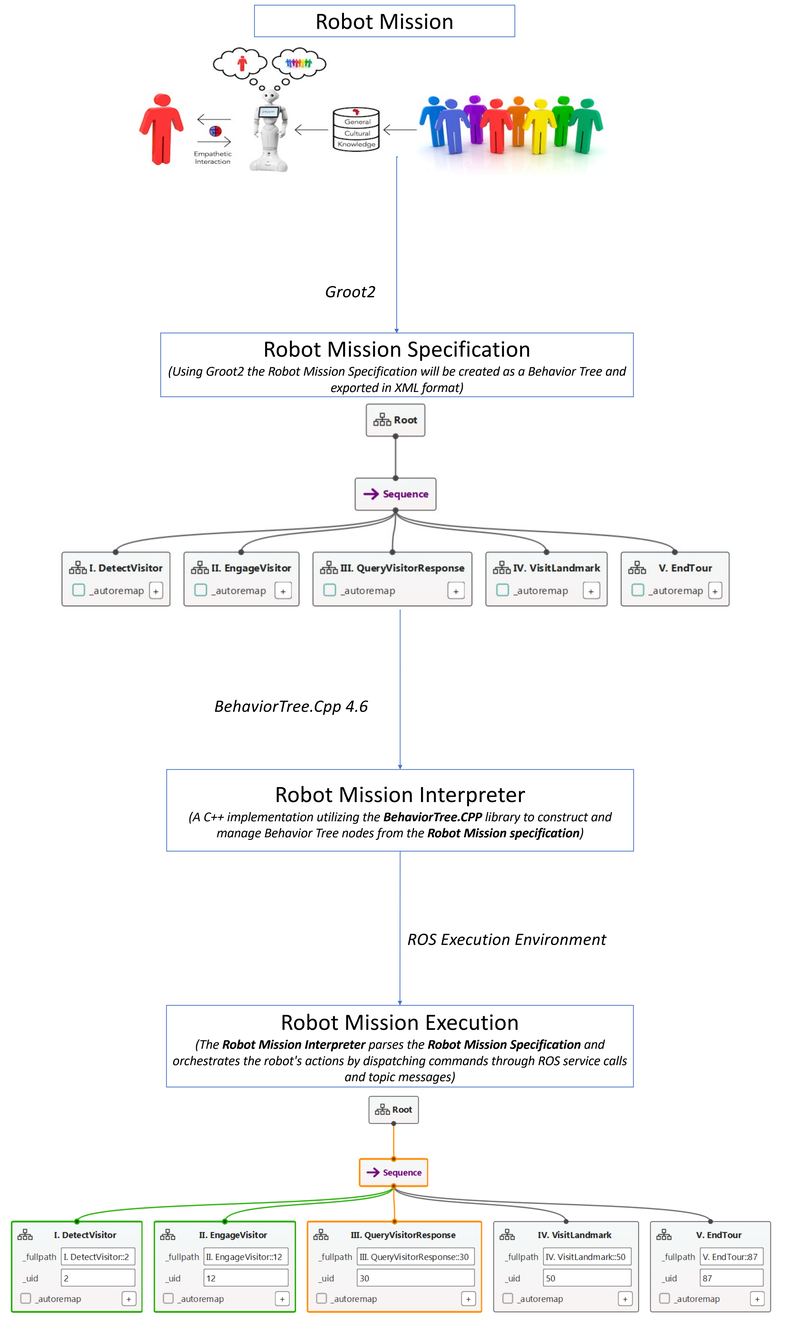


Groot2 – IDE for designing Behavior Trees

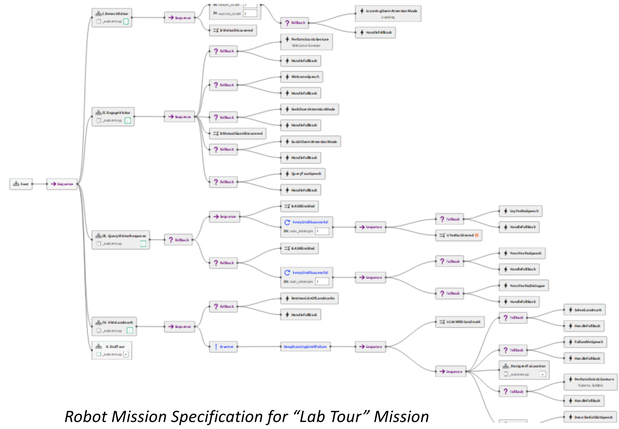


BehaviorTree.CPP 4.6 – library for implementing Robot Mission Interpreter

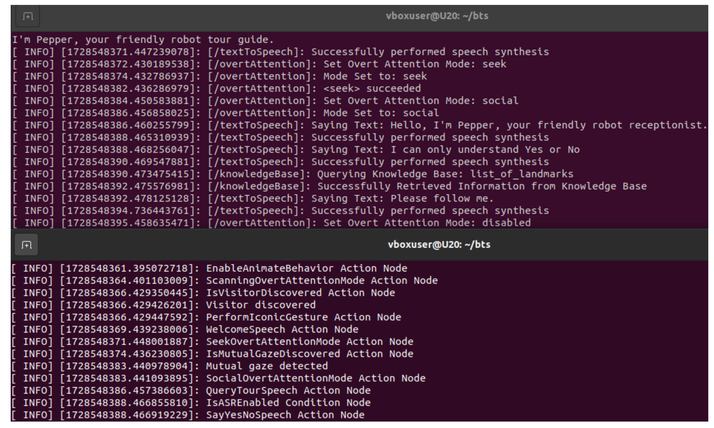
Methodology



Preliminary Results



Robot Mission Specification for "Lab Tour" Mission



Robot Mission Execution simulation, using stubs and drivers, and without including Cultural Knowledge

References

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