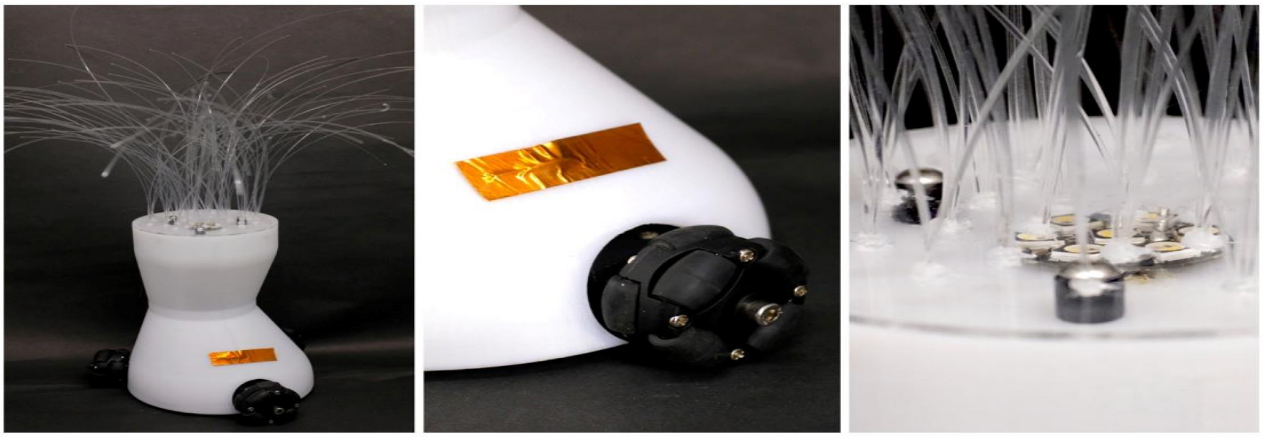

Software Architectural Descriptions

YOLO

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1. Introduction

1.1. Purpose and objectives of the YOLO social robot

The purpose of the system is to design and develop a toy in order to encourage creativity among children by allowing them to create stories via YOLO. Moreover, YOLO's AI system responds to children's emotional state such that it chooses among Exuberant, Aloof, and Harmonious state. Furthermore, by detecting the children's stories YOLO's AI system chooses contrast or mirroring action.

1.2. Scope

In the scope of this system, it aims to contribute to the children's psychological development by allowing them to explore their deep emotions. For example, imagine a child that is behind from his/her peers in emotional development, YOLO can be used for children to understand their emotions and imagination. It can also be used by psychologists or pedagogue to observe children's psychological state.

YOLO accomplished to contribute to the children's psychological development by its advanced AI and control system. For example, in order to simulate a different perspective of a story YOLO acts in contrast action such that it moves different from the children's movements.

This scope can be extended. For example, in a story which a child created YOLO can simulate different social profiles to exhibit social behaviors, which can contribute child to experience distinct emotional actions. It also enriches the story of the child.

1.3. Stakeholders and their concerns

The target stakeholders can be divided into two groups as developers and users. Firstly, developers use that device in order to improve and add new functionalities. In this way, they personalize the YOLO on their purpose. On the other hand, users, children, use YOLO to create stories which helps them to stimulate their imaginations and emotional development.

Children that are using YOLO might be negatively effected by the device. For example, since the device choose the next move according to children' movements, it might act in a way that hurts the children physically or psychologically. Moreover, developers that change or add functionalities of the device might disrupt the existing device. For example, when a developer tries to add new emotional state, it might damage the existing emotional states.

2. References

This document is prepared with respect to IEEE 29148-2011 standard:

29148-2011 - ISO/IEC/IEEE International Standard - Systems and software engineering – Life cycle processes –Requirements engineering.

[1] P. Alves-Oliveira, P. Arriaga, G. Hoffman, A. Paiva, Guide to build YOLO, a creativity-stimulating robot for children, HarwardX 6 2019.e00074, http://www.elsevier.com/locate/ohx

[2] P. Alves-Oliveira, P. Arriaga, A. Chandak, G. Hoffman, A. Paiva, Software architecture for YOLO, a creativity-stimulating robot, HarwardX 6 2020.100461, http://www.elsevier.com/locate/softx

3. Glossary

Term	**Definition**
AI System	Artificial intelligence system. In an abstract way, it is the brain of the YOLO. It decides which action should be taken in any moment.
Controller	It performs the action that is decided by the AI system
API	Application Programming Interface
YOLO	Your Own Living Object

4. Architectural Views

4.1. Context View

4.1.1. Stakeholders' use of this view

4.1.2. Context Diagram

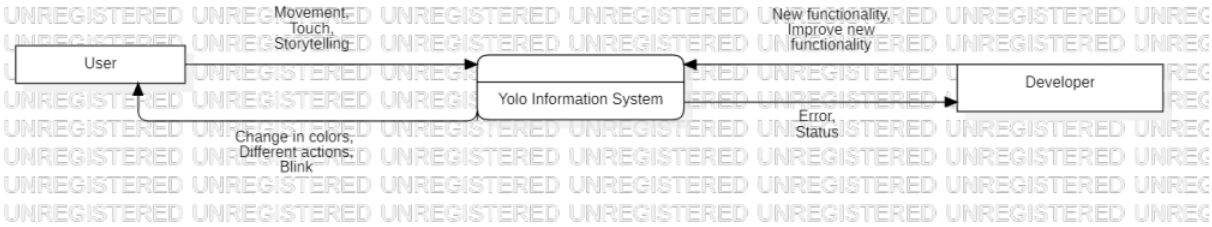

Figure 1: Context Diagram

4.1.3. External Interfaces

4.1.4. Interaction scenarios

4.2. Functional View

4.2.1. Stakeholders' use of this view

4.2.2. Component Diagram

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4.3.2. Database Class Diagram

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4.4.1. Stakeholders' use of this view

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4.5. Design Rationale