

# Happybox – an ergonomic and sustainable smart toy block platform that grows as you grow

Seeyou Park<sup>1</sup>, Hyeri Kwon<sup>1</sup>, Gyouhyung Kyung<sup>1,2</sup>, Ian Oakley<sup>1,2</sup>, Chajoong Kim<sup>1,3</sup>, Taikjin Lee<sup>4</sup>,  
Seok Lee<sup>4</sup>

<sup>1</sup>School of Design and Human Engineering, UNIST

<sup>2</sup>Department of Human and Systems Engineering, UNIST

<sup>3</sup>Department of Industrial Design, UNIST

<sup>4</sup>Sensor System Research Center, KIST

## ABSTRACT

**Objective:** The aim of this study is to incorporate children's cognitive/affective developmental stages into the smart toy development process and to propose a final prototype equipped with interactive technologies. **Background:** It is necessary to do more academic research on how smart toy can help children's physical, cognitive and affective development. It can be beneficial to study smart toy which could enrich children's experience for the purpose of education as well as play. **Method:** (1) We have conducted background research including literature review, interview, and benchmarking, resulting in 10 major insights. (2) The Analytic Hierarchy Process (AHP) was used to narrow down design concepts. (3) We grouped and categorized children's developmental features and recommended play scenarios. (4) We matched design scenarios and functional requirements. (5) We built a prototype based on selected scenarios and functional requirements. **Results:** An ergonomic smart toy block has been developed, which can grow (functionally expand) as children grow in order to extend its lifespan, and serve as a smart toy platform as well. **Conclusion:** Happybox – an ergonomic, sustainable smart toy block platform has been developed which can be used by children and kidult. **Application:** A new smart toy platform that is functionally expandable and compatible with the Lego blocks is expected to define and create a new toy market.

Keywords: Smart toy, Tech toy, Ergonomics for children, Developmental stages