Table of Contents

State of the Art 3
Introduction 3
Domain Analysis 3
Existing Solutions 3
Data-Driven Approaches 3
User Experiences and Interaction Design 4
Technology Analysis 4
Gap Analysis 4
Summary 4

State of the Art

This chapter provides the reader with the relevant technical-scientific background as well as existing related products and research, also known as the state of the art, in the field(s) of the project.

Introduction

Provide here an overview of the contents (structure) of this chapter.

Domain Analysis

Application domain

Current practices

Existing challenges

Opportunities for data-driven solutions

These are examples of citations to books **[1]** and **[2]**, a chapter on a smart companion **[3]**, articles on IoT **[4]**, blimps **[5]**, cloud computing **[6]**, gas emissions **[7]**, pedestrian crossing behaviour **[8]**, smart bicycles **[9]** and diaper moisture **[10]**, and to Web resources **[11]**, **[12]** and **[13]**.

Existing Solutions

Commercial solutions

Open-source solutions

Research prototypes

Data-Driven Approaches

Relevant data analysis techniques

Machine learning and AI approaches (if applicable)

Data visualisation approaches

Decision-support approaches

Compare selected solutions considering the requirements of your own solution

User Experiences and Interaction Design

Existing user interfaces

User-centred design principles

Good practices and design patterns

Technology Analysis

Relevant architectures

Frameworks

Tools and platforms

Gap Analysis

Summary of limitations of existing solutions

Identified opportunity

Positioning of the proposed solution

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

Based on this study of the state of the art, the team decided to adopt the following <specify here the architecture, technique(s), material(s), component(s)> because <specify here the technical/scientific reasons>.

---

[1] Rita Thapa, Hom Bahadur Rijal, Masanori Shukuya, Hikaru Imagawa, 2019. Study on the wintry thermal improvement of makeshift shelters built after Nepal earthquake 2015. *Energy and Buildings*, 199, pp.62 - 71, ISSN 0378-7788.
[2] Kazuko Obayashi, Shigeru Masuyama, 2020. Pilot and Feasibility Study on Elderly Support Services Using Communicative Robots and Monitoring Sensors Integrated With Cloud Robotics. *Clinical Therapeutics*, ISSN 0149-2918.
[3] Alexandre Soares dos Reis, Elien Gielen, Ko Wopereis, Marcel Pasternak, Vaido Sooäär, Tobias Schneider, Abel J. Duarte, Benedita Malheiro, Jorge Justo, Cristina Ribeiro, Manuel F. Silva, Paulo Ferreira, Pedro Guedes, 2020. Smart Companion Pillow – An EPS@ISEP 2019 Project. *Robot 2019: Fourth Iberian Robotics Conference*, Cham: Springer International Publishing, pp.465–476, ISBN 978-3-030-36150-1.
[4] Abdelbaset S. Hamza, Rahman Tashakkori, Bejamen Underwood, William O'Brien, Chris Campell, 2023. BeeLive: The IoT platform of Beemon monitoring and alerting system for beehives. *Smart Agricultural Technology*, 6, pp.100331, ISSN 2772-3755.

[5] Manuel Mahn, Markus Kemper, 2006. A BEHAVIOUR-BASED NAVIGATION SYSTEM FOR AN AUTONOMOUS INDOOR BLIMP. *IFAC Proceedings Volumes*, 39, pp.837-842, ISSN 1474-6670.
[6] B. Sotomayor, Ruben S. Montero, I.M. Llorente, I. Foster, Sept 2009. Virtual Infrastructure Management in Private and Hybrid Clouds. *Internet Computing, IEEE*, 13, pp.14-22.
[7] Ranjith, V. Velmurugan, S. Thanikaikarasan, 2020. Prediction of Exhaust Gas Emission characteristics using Neem oil blended bio-diesel in diesel engine. *Materials Today: Proceedings*, 21, pp.870 - 875, ISSN 2214-7853.
[8] Anae Sobhani, Bilal Farooq, 2018. Impact of smartphone distraction on pedestrians crossing behaviour: An application of head-mounted immersive virtual reality. *Transportation Research Part F: Traffic Psychology and Behaviour*, 58, pp.228 - 241, ISSN 1369-8478.
[9] YeongKyun Lee, Jongpil Jeong, 2018. Design and Implementation of Monitoring System Architecture for Smart Bicycle Platform. *Procedia Computer Science*, 134, pp.464–469, ISSN 1877-0509.
[10] Tareq Khan, May 2018. A Smart Wearable Gadget for Noninvasive Detection and Notification of Diaper Moister. *2018 IEEE International Conference on Electro/Information Technology (EIT)*, pp.0240-0244, ISSN 2154-0373.
[11] Android Open Source Project, 2014. *Android Developers: Android 4.1 APIs.* [Accessed in April 2017].
[12] Cloud Expo, 2008. *Twenty-One Experts Define Cloud Computing.* [Accessed in April 2021].
[13] Gartner, 2021. *Gartner Magic Quadrant for Data Science and Machine Learning Platforms.* [Accessed in April 2021].

From:
https://www.mads4e.dee.isep.ipp.pt/ - **MADS4Engineering**

Permanent link:
https://www.mads4e.dee.isep.ipp.pt/doku.php?id=report:soa&rev=1788887872

Last update: **2026/09/08 18:17**