XBCAD7319
WORK INTEGRATED LEARNING
MOVEWITHME
SPRINT 1: CONCEPTUALISING AND PLANNING DOCUMENT

GitHub repo:

https://github.com/chrisgteague/Wil-GR-2-KinecticPulse-Innovations-Move-With-Me

Group members:

ST10083450 – Christopher Gary Teague

ST10198049 – Ethan Swanepoel

ST10083397 – James Pollard

ST10219921 – Mishka Dewlok

ST10042220 – Tariq Barnabas

Supervisors:

Denzyl Govender

Sarina Till

Yusuf Paruk

Project Overview:

The goal of our project, MoveWithMe, is to develop innovative children's clothing embedded with sensors to track and promote movement. The smart clothing will utilize a combination of hardware and software components to provide real-time data on children's physical activity levels, encouraging healthier habits and facilitating parental monitoring. The project aims to enhance child development through active play while providing valuable insights for parents and caregivers.

Project Objectives:

1. Design and develop smart clothing prototypes with integrated movement tracking sensors.

2. Implement software algorithms to analyse movement data and provide actionable insights.

3. Ensure user-friendly interface for parents to monitor and track their child's activity levels.

4. Conduct rigorous testing and refinement to ensure accuracy and reliability of sensor data.

5. Establish partnership with neonatologists and occupational therapists and child development experts for validation and advice.
6. Develop a scalable manufacturing process for production of the smart clothing (at the end).

Project Scope:

The project scope encompasses the following key aspects:
- Hardware Development: Designing and integrating sensors (e.g., accelerometers, gyroscopes) into children's clothing.
- Software Development: Creating algorithms for real-time data analysis, user interface development for parents' monitoring, and mobile application integration.
- Testing and Validation: Conducting thorough testing to ensure accuracy, reliability, and safety of the smart clothing.
- Regulatory Compliance: Ensuring compliance with relevant safety and regulatory standards for children's products, as well as registering with the research council.

Project Deliverables:

1. Smart clothing prototypes with integrated movement tracking sensors.
2. Software application for real-time data analysis and parental monitoring.
3. Testing and validation reports demonstrating the accuracy and reliability of sensor data.
5. Resource materials
6. Regulatory compliance documentation.

Project Timeline:

Phase 1: Research and Planning (2 months)
- Conduct research and identify target audience.
- Define technical requirements and specifications.

Phase 2: Design and Development (6 months)
- Develop hardware prototypes with integrated sensors.
- Brainstorm clothing ideas
- Develop working hardware skills
- Design software algorithms for data analysis and user interface.
- Conduct iterative testing and refinement.

Phase 3: Testing and Validation (2 months)
- Conduct comprehensive testing to ensure accuracy and reliability.
- Validate sensor data with neonatologists and occupational therapists

Phase 4: Deliver and Present (1 month)
- A fully planned presentation demonstrating and marketing our project to supervisors, lecturers and other student individuals

Progress as of 2 April 2024:

We have already met and discussed with 2 of our supervisors regarding the project. Under the wing of Sarina for hardware, and Yusuf for software. We have been given different hardware components such as sensors, accelerometers, gyroscopes, speakers and Arduino boards to work with. These components will work with Arduino code in the Arduino IDE. We have also been advised for the development of a software API to communicate with the sensors, using Kotlin in android studio. Our team has already started meeting and expanding our knowledge by experimenting with the hardware components and successfully getting them working. We are in the process of developing a prototype by incorporating all the hardware into fabric, which we will take to the research council and get approval. During the course of our development phase, we have been advised that we will go on guided trips to the midlands rural area with our supervisor, in order to test the prototype on children and get feedback and advice from their mothers. Our advice will also come from working with registered neonatologists and occupational therapists to further guide and structure our development process.

Project Team:

- Project Manager
- Hardware Engineers
- Software Engineers
- Testers
- Researcher

Budget:

The budget for the project will be allocated across various phases including research, development, testing, resources, and field trips including meal allowances. Detailed budgeting will be done during the development phase to ensure efficient utilization of resources. As it stands, we have been allocated roughly ZAR 186 000.

Risk Strategies:

- Technical Challenges: Regular communication and collaboration among team members, conducting thorough testing at each stage, and maintaining flexibility to adapt to unforeseen technical challenges.
- Ethical Challenges: Regular meetings with supervisors to guide the development process as well as getting approval from the ethics council prior to development

<u>Conclusion:</u>

The development of children's smart clothing with movement tracking sensors represents an innovative approach to promoting active lifestyles and enhancing child development. By combining hardware and software technologies, this project aims to provide parents with valuable insights into their child's physical activity levels while encouraging healthy habits and active play. Through diligent planning, execution, and collaboration, we aim to deliver a high-quality product that meets the needs of both children and parents, ultimately contributing to the well-being and development of future generations.