Low-Cost Sensing and Data Analytics for Understanding Usage Patterns of Early Years Powered Mobility Devices

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This research involves working in close collaboration with families and disabled children using an Early Years Powered Mobility Device. We are trying to find pragmatic solutions for long-term collection of quantitative data – enabling reliable and robust sensing of everyday activity in the EYPMD to generate measurable indicators of impact. This will also help to bring about more awareness and appreciation of the lived experience of very young children with disability.

Quantitative Measures

**Physical and Independent Mobility**
- Duration of Activity
- Distance covered
- Area covered (in the home)
- Area covered (outside)
- Terrains covered
- Number of collisions
- Number of Parental interventions
- New methods of play
- Involvement in play

**Cognitive Development**

**Social Development**

**Measurable Indicators of Impact**

- **Cost**
  - Ruggedness
  - Reliability
- **Easy to Install and Maintain**
- **Convenience to Parents**
- **Sensitivity of Measurements**
- **Secure Data Storage and Upload**
- **Flexibility of Sensor Optimisation**
- **Long Battery life**
- **CE marked**

**Critical Factors for Sensing Technology Selection**

1. Accelerometer xyz (100 Hz)
2. Gyroscope xyz (100 Hz)
3. Sound Level (10 Hz)
4. GPS Location (long, lat, altitude)
5. Network Location
6. Phone uptime
7. Phone battery life
8. Phone battery temperature

We have created a secure & versatile Android App for a Smartphone – leveraging on the inbuilt sensors available.

We record and log a range of sensor data, including information regarding the status of the device. We also use Axivity sensors on the parent’s controller so we know when the parent is driving the EYPMD.

**Low Cost Sensing Devices**

**A day in the life - Wizzybug Activity**

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