AUGMENT IT FOR SHOT PUT

MEDICAL ENGINEERING PROJECT COURSE KTH

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PROJECT OUTLINE

INTRODUCTION

DEMONSTRATION

END USER AND TECHNICAL PERSPECTIVE SOLUTION

VALIDATION

REFLECTION

1. INTRODUCTION

PROBLEMS

- **Technologies** currently on the market are **expensive, hard to use** and **not intuitive**.
- **Coach difficulties** to explain and visualize the **athletes flaws**.
- Data **insufficient** to visualize the **flaws**.

PREVIOUS SOLUTIONS

- Motion capture labs
- Video analysis
- Online coach that analyzes video and gives feedback
- High speed cameras to analyze the throw

PROJECT SOLUTIONS

- Matlab **application** that uses an inertial measurement unit (IMU) as a method of recording the values of **acceleration** and **gyroscope**.
  Synchronize the **video** with the sensor data.


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2. DEMONSTRATION


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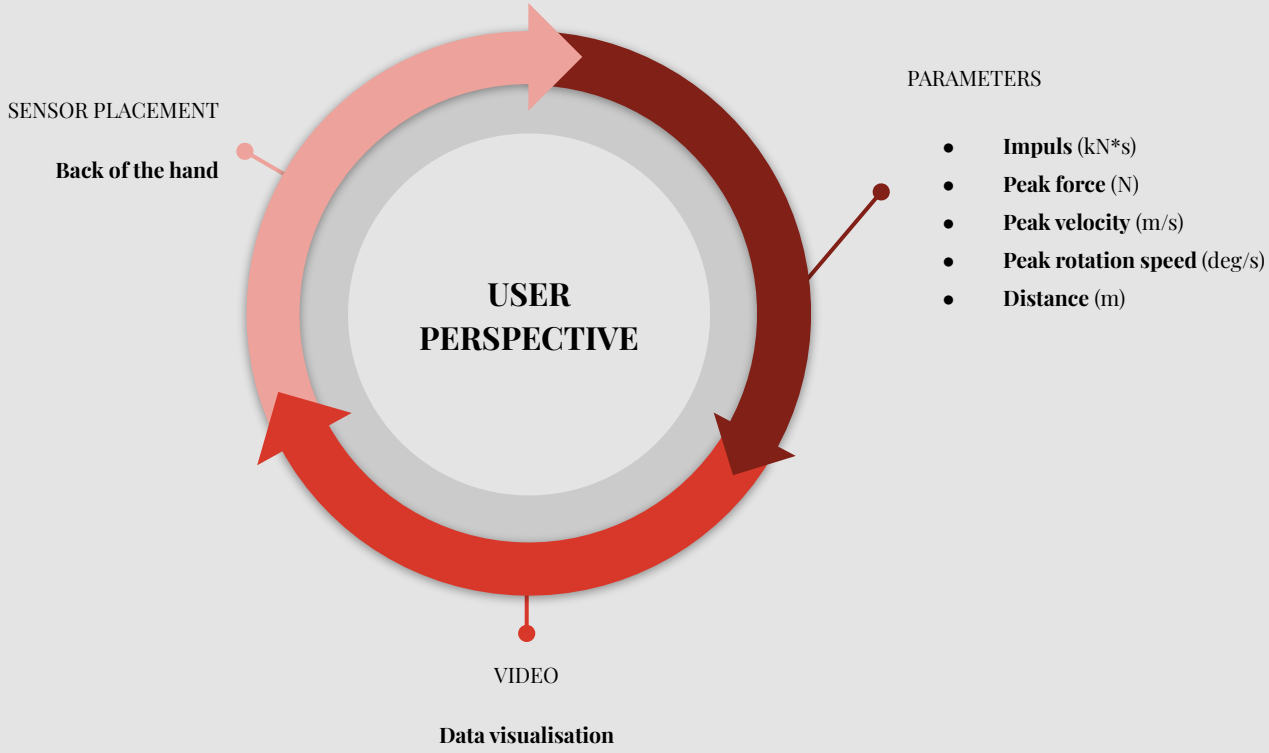
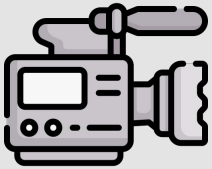
3.1 USER PERSPECTIVE SOLUTION

The App was designed according to the needs of an interviewed professional shot put athlete.

3.1 USER PERSPECTIVE SOLUTION

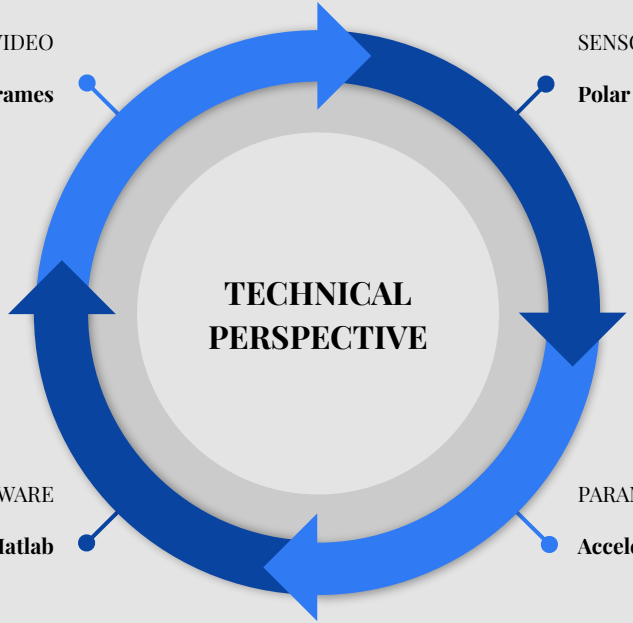


3.2 TECHNICAL PERSPECTIVE SOLUTION



VIDEO

Camera frames



SENSOR

Polar verity sensor

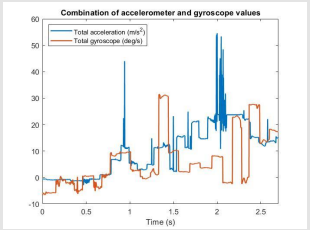
MATLAB

SOFTWARE

Matlab

PARAMETERS

Acceleration, gyroscope

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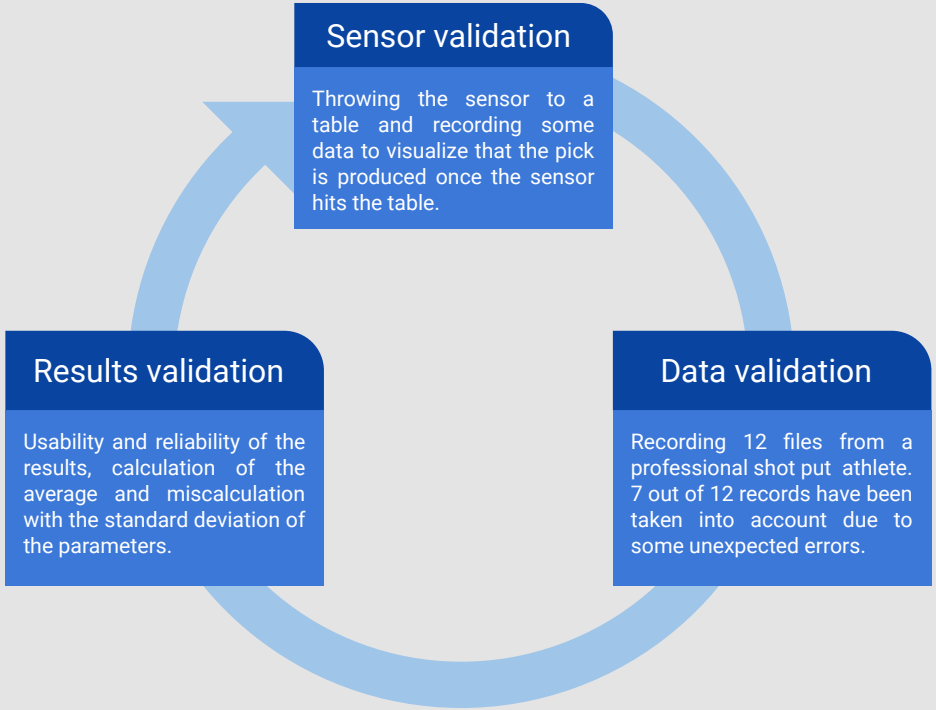
4. VALIDATION OF SOLUTION & RESULTS

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5. REFLECTION

Successful

- Interviewed a shot put athlete
- Data analysis with Matlab
- Intuitive Matlab application
- Calculation of the useful parameters
- Display simultaneously the acceleration graph with the video
- Validate the results

Improvements

- Automatic synchronization of the video and data
- Change the speed of the video
- Implementation of Kalman filter
- Add buttons for the slider
- Make the app useful for other sports like sledge hammer, discus or javelin throw
- Further interviews and data collection with more athletes

THANKS FOR YOUR ATTENTION