SUTD-MIT International Design Centre (IDC)

RESEARCH PROPOSAL FOR IDC UROP

SUMMARY OF PROPOSED RESEARCH

|  |  |
| --- | --- |
| **Title:** | Bowlinsight |
| **Date of Submission:** | 29-Dec-17 |
| **Proposed Student Participant(s):** | |  |  |  |  | | --- | --- | --- | --- | | **Name:**  Joel Tan | | | **Student ID:**  1002738 | | **Email:**  [joeltan@mymail.sutd.edu.sg](mailto:joeltan@mymail.sutd.edu.sg) | | | **Contact No:**  97258435 | | **Pillar:**  Freshmore | **Gender:**  Male | | **Nationality:**  Singaporean | | **Year of Matriculation:**  2017 | | **Expected Year of Graduation:**  2020 | | |
| **Proposed Faculty Mentor:** | Arlindo Silva |
| **SUTD IDC Funding Requested (S$):** | 2000 |
| **Proposed Start Date:** | 29-Dec-17 |
| **Proposed End Date:** | 29-Dec-18 |

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| --- | --- | --- | --- | --- | --- |
| Describe the role of each team member listed | |  |  | | --- | --- | | Name | Description | | Joel Tan |  | |
| Background | Amateur bowlers wish to improve their gameplay. However, they do not have access to constructive feedback, nor can they track the consistency of their gameplay effectively. |
| Aims | Bowlinsight aims to incorporate an inertial measurement unit that logs the data, and processes it by comparing against the data from strokes by bowling coaches to give suggestions to improve gameplay. |
| Methodology | Most of the typical mistakes made by amateur bowlers can be found and corrected in their arm movements, hence we incorporate an inertial measurement unit in our prototype, that we trial mounted at different positions: the elbow, the wrist and the back of hand. The data is then processed to infer the dynamics of the bowling stroke that is critical to gameplay. The product then logs the data, and processes it by comparing against the data from strokes by bowling coaches to give suggestions to improve gameplay. Since the straight throw is the most basic throw that any bowler should have in their repertoire, the suggestions will aim to improve the bowlers straight throw. |
| **Expected outcomes, significance or rationale** | We hope to produce a product that offers players a reliable and objective account of their consistency, while providing insights for improvement. The product has the potential to allow amateurs to better enjoy the game recreationally by paving an easier pathway to improve, further motivating them to play better. Planned deliverables include a final report of the project and a prototype for display at the IDC gallery. |
| Timetable | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Research Milestones / Deliverables** | **Month** | | | | | | | | | | | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | | Collect data |  |  |  | 1 |  |  |  |  |  |  |  |  | | Design UI |  |  |  | 1 |  |  |  |  |  |  |  |  | | CAD Product |  |  |  | 1 |  |  |  |  |  |  |  |  | | Manufacturing |  |  |  |  |  |  |  | 1 |  |  |  |  | | Feedback |  |  |  |  |  |  |  | 1 |  |  |  |  | | Redesign |  |  |  |  |  |  |  |  |  |  |  | 1 | |

## BUDGET TABLE

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit Price (S$) | Quantity | Sub-Total (S$) |
| Expenditure on Manpower (EOM) | | | |
|  |  |  |  |
| Equipment | | | |
|  |  |  |  |
| Other Operating Expenses (OOE) / Materials & Supplies (M&S) | | | |
| Inertial measurement unit | $10-50 | 1 | $50 |
| Batteries | $20 | 1-3 | $60 |
| Bluetooth module | $50 | 1-3 | $150 |
| Strap parts and manufacturing | $0-50 | 1-3 | $150 |
| Bowling trials | $5 | 100 | $500 |
| Printing of Materials | $2 | 50 | $100 |
| Prototyping | Depends | 1 | ? |
| Travel | | | |
|  |  |  |  |
| Total (S$) | | | >$1010 (upper bound estimate) |

## JUSTIFICATION FOR BUDGET

## Most of the budget will be spent on parts to produce the prototype and bowling games for collecting data. Parts are usually around $50 or less apiece and reusable. We will require money to pay for the bowling trials required for data collection and testing. Other miscellaneous fees eg. Printing are expected. The initial 3 prototypes made during our 3.007 course costed approximately $300 in total, under a relatively liberal spending environment. The budget listed above is intentionally less than the full $2000 requested as the leftover will be used as a buffer for design iterations and unforeseen expenses.

Rough estimated Timeline for budget:

We will be using the initial prototype that we developed previously in 3.007 Intro to design for trials. We will start prototyping when we have a better understanding of what design our final product should take. We will create a copy of the initial prototype (costs approx. $50) if the initial prototype breaks or for faster data collection.

3rd – 6th month: $400 on initial parts and bowling trials for data collection

7th -- 10th month: $$400 on designing and prototyping

11th – 12th month: tbc for future review

## LAB SPACE REQUEST\*

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| --- | --- |
| **Preferred Lab Space Location:**  (Actual allocation might differ) | 3.107 |
| **Start Date:** | 29-Dec-17 |
| **End Date:** | 29-Dec-18 |
| **Lab Space Request Details:** | 3D printers, Soldering kit, basic tools and power tools |

DECLARATION OF ETHICS CONSIDERATION

**Indicate whether your research requires ethics consideration:No**

**Please tick, where appropriate, if your research involves the following:**

|  |  |
| --- | --- |
| Human subject(s) |  |
| Use of Human Tissues or Cells |  |
| Animal Experimentation |  |
| Use of Animal Tissues or Cells |  |
| Requirement for containment |  |

DECLARATION BY APPLICANT(S)

I / We, the undersigned agree to abide by the terms and conditions governing the award of the project budget by SUTD and follow the prevailing Finance, HR and Procurement guidelines of the University.

|  |  |
| --- | --- |
| **Name:** |  |
| **Signature:** | 16-Jan-18 |

SUPPORT BY MENTOR *(Application will not be processed without a mentor’s endorsement)*

|  |  |
| --- | --- |
| **Name:** |  |
| **Designation:** |  |
| **Signature:** | 16-Jan-18 |
| **Comments (if any):** | |

For IDC internal use:

ENDORSEMENT OF RESEARCH PROPOSAL

|  |  |
| --- | --- |
| **Name:** |  |
| **Designation:** |  |
| **Signature:** | Click here to enter a date. |
| **Comments (if any):** | |