ECE-411 Homework #2 –Decision Matrix

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Our decision matrix is below. The criteria we used was subjective assignment based on our knowledge of the ideas and our personal interest. The weighting was assigned during a meeting based on brainstorming discussions and applied in the process provided by our book. Final result matrix is below and contributing calculation matrices follow on subsequent pages.

Decision Matrix Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria: |  |  | Projects: |  |
| Complexity | A |  | IR Power | 1 |
| Match to Skills | B |  | Shift Light | 2 |
| Feasibility | C |  | Kid Leash | 3 |
| Personal Interest | D |  | Prox Sensor | 4 |
| Usefulness | E |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Final Scores |  |  |  |  |  |
| Selection Criteria | Weights | Alternatives | | | |
| 1 | 2 | 3 | 4 |
| A (Complexity) | 0.24 | 0.52095471 | 0.1897484 | 0.09954848 | 0.1897484 |
| B (Skills) | 0.11 | 0.35200157 | 0.17600079 | 0.17600079 | 0.29599686 |
| C (Feasibility) | 0.21 | 0.35395277 | 0.10192096 | 0.1901735 | 0.35395277 |
| D (Interest) | 0.38 | 0.18350342 | 0.18350342 | 0.18350342 | 0.44948974 |
| E (Usefulness) | 0.05 | 0.10840273 | 0.10840273 | 0.54201367 | 0.24118086 |
| **Score** |  | 0.31323082 | 0.16145454 | 0.18002014 | 0.3352945 |

Decision Matrix Contributing Calculations

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Weighting Chart |  |  |  |  |  |  |  |
|  | A | B | C | D | E | Geometric Mean | Normalized Weights |
| A | 1.00 | 3.00 | 1.00 | 0.33 | 5 | 1.37 | 0.24 |
| B | 0.33 | 1 | 0.33 | 0.33 | 3 | 0.64 | 0.11 |
| C | 1 | 3 | 1 | .33 | 3 | 1.2 | 0.21 |
| D | 3 | 3 | 3 | 1 | 7 | 2.2 | 0.38 |
| E | .2 | .33 | .33 | .14 | 1 | 0.31 | 0.05 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Comparison: Complexity** | **1** | **2** | **3** | **4** | **Geometric Mean** | **Normalized Weights** |
| **1** | 1 | 3 | 5 | 3 | 2.942830956 | 0.520954707 |
| **2** | 0.33 | 1 | 2 | 1 | 1.071873374 | 0.189748405 |
| **3** | 0.2 | 0.5 | 1 | 0.5 | 0.562341325 | 0.099548484 |
| **4** | 0.33 | 1 | 2 | 1 | 1.071873374 | 0.189748405 |
|  |  |  |  |  |  |  |
| **Comparison: Skills** | **1** | **2** | **3** | **4** | **Rating** | **Normalized Weights** |
| **1** | 1 | 2 | 2 | 1 | 1.681792831 | 0.352001571 |
| **2** | 0.5 | 1 | 1 | 1 | 0.840896415 | 0.176000785 |
| **3** | 0.5 | 1 | 1 | 0.5 | 0.840896415 | 0.176000785 |
| **4** | 1 | 1 | 2 | 1 | 1.414213562 | 0.295996859 |
|  |  |  |  |  |  |  |
| **Comparison: Feasibility** | **1** | **2** | **3** | **4** | **Rating** | **Normalized Weights** |
| **1** | 1 | 3 | 2 | 1 | 1.861209718 | 0.353952771 |
| **2** | 0.33 | 1 | 0.5 | 0.33 | 0.535936687 | 0.101920957 |
| **3** | 0.5 | 2 | 1 | 0.5 | 1 | 0.190173502 |
| **4** | 1 | 3 | 2 | 1 | 1.861209718 | 0.353952771 |
|  |  |  |  |  |  |  |
| **Comparison: Interest** | **1** | **2** | **3** | **4** | **Rating** | **Normalized Weights** |
| **1** | 1 | 1 | 1 | 0.33 | 1 | 0.183503419 |
| **2** | 1 | 1 | 1 | 0.33 | 1 | 0.183503419 |
| **3** | 1 | 1 | 1 | 0.5 | 1 | 0.183503419 |
| **4** | 3 | 3 | 2 | 1 | 2.449489743 | 0.449489743 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Comparison: Usefulness** | **1** | **2** | **3** | **4** | **Rating** | **Normalized Weights** |
| **1** | 1 | 1 | 0.2 | 0.33 | 0.447213595 | 0.108402734 |
| **2** | 1 | 1 | 0.2 | 0.33 | 0.447213595 | 0.108402734 |
| **3** | 5 | 5 | 1 | 3 | 2.236067977 | 0.542013672 |
| **4** | 3 | 3 | 0.33 | 1 | 0.994987437 | 0.241180859 |