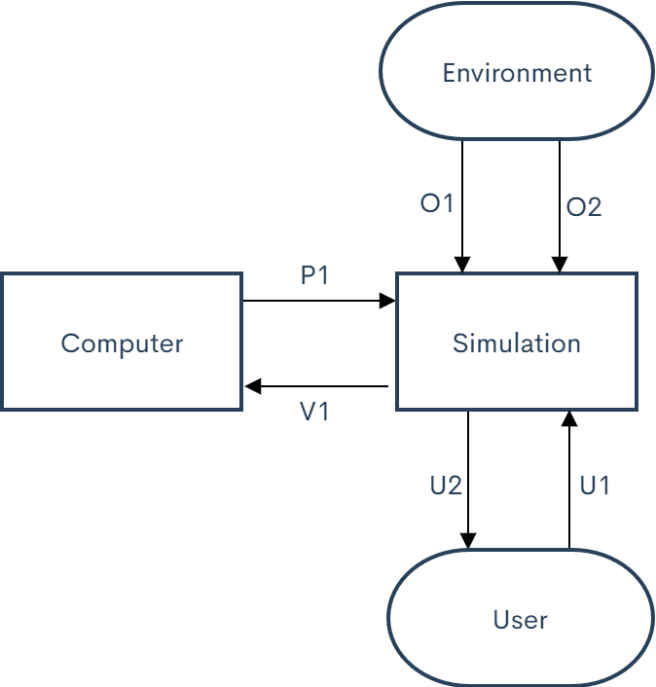
# System description

## Flowchart



## Unique identifiers

|  |  |
| --- | --- |
| Unique ID | Long Name |
| U1 | User input |
| U2 | User output |
| P1 | Processing power |
| O1 | Environment impact temperature |
| O2 | Environment impact humidity |
| V1 | Calculated values |

## Table of limits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interaction | Symbol | Min. | Max. | Unit |
| -> U1 | | | | |
| User input |  |  |  |  |
| Motor input rotation |  | 540 | 3300 | RPM |
| Motor input torque |  | 5,4 | 33 | Nm |
| Propeller blade count | - | 2 | 6 | # |
| Propeller size (diameter) |  | 0,1 | 0,5 | m |
| Propeller torque |  | 5 | 30 | Nm |
| Propeller blade surface area | *Will not be considered in the design.* | | | |
| Propeller blade coefficient |  | 0 | 1,2 | - |
| (Blade pitch) | | | | |
| Propeller pitch | - | 35 | 39 | ° |
| (Dalian MaritimeUniversity, 2018) | | | | |
| Propeller coefficient |  | 0 | 0.4 |  |
|  | J | 0 | 0.9 |  |
| (SIMM Machinery Exhibition, 2019) | | | | |
| Shaft density |  |  |  |  |
| Shaft size (diameter) |  |  |  | m |
| Shaft length |  | 0,25 | 1 | m |
| Shaft torsional stiffness |  |  |  | Pa |
| (Hardness of general gears, 2017) | | | | |
| Gear material hardness |  |  |  | Pa |
| Gear size (diameter) |  |  |  | m |
| (Standard gear tooth number, 2019) | | | | |
| Gear tooth number | - | 18 | 25 | # |
| Gear contact friction |  |  |  | N |
| Gear tooth shape |  |  |  |  |
| (Viscosity index) | | | | |
| Lubricant viscosity |  | 5 | 30 | Pa\*s |
| Bearing type | *Bearing types can be found in table (#).* | | | |
| Bearing inner diameter |  |  |  | m |
| Bearing outer diameter |  |  |  | m |
| Bearing friction |  |  |  | N |
| (Bearing friction coefficient, 2018) | | | | |
| Bearing friction coefficient |  |  |  | - |
| U2 -> |  |  |  |  |
| User ouput |  |  |  |  |
| Thrust |  | 9 | 550 | N |
| Total power loss |  | 5 | 30 | % of |
| -> P1 |  |  |  |  |
| Processing power |  |  |  |  |
|  |  |  |  | GHz |
|  |  |  |  |  |
| V1 -> |  |  |  |  |
|  |  | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| -> O(#) -> |  |  |  |  |
| Environmental impacts | *Will not be considered in the design.* | | | |

# Reference

Bearing friction coefficient. (2018/6/27). source: https://wenku.baidu.com/view/3b7e69d133d4b14e852468ff.html

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