

Geometry input data

Starting from a database, a file *.txt* with all the propeller/rotor/turbine geometry information, the function provides different variables that can be needed for different analysis.

syntax

All inputs are the function identifier as a text, while outputs are structure arrays that contains all the variables needed by each function.

```
[X]= input_per_la_geometria(txt)
```

Where:

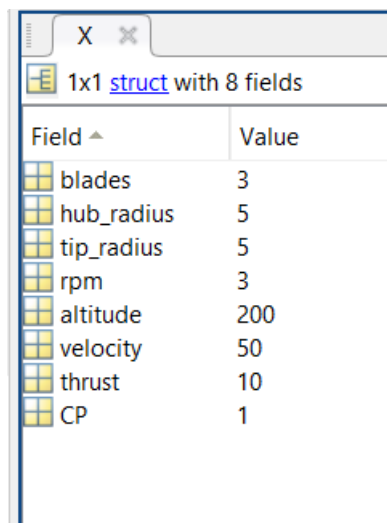
INPUT
txt function identifier

OUTPUT
X structure array

example

A test case is shown below, where it is called in input the identifier '*Opti-Prop*' to which it corresponds the function that provides the axial and the rotational inductions and the thrust and power coefficient distributions of the optimal propeller. In output the function for geometry data input provides the variables needed in input by the function *OptiProp.m* as shown in figure 1.

```
clc; close all; clear all;  
X= Geometry_input_data('Opti-Prop');
```



The image shows a MATLAB variable viewer window titled 'X'. It displays a 1x1 struct with 8 fields. The fields and their values are listed in a table below.

Field	Value
blades	3
hub_radius	5
tip_radius	5
rpm	3
altitude	200
velocity	50
thrust	10
CP	1

Figure 1: X, structure arrays, output of the function for geometry input data in case of *OptiProp.m*

code listing

```
function [X]= Geometry_input_data(txt)

PropDataFileName='propgeometry.txt';    %.txt standard geometry file
myProp=geometryreader(PropDataFileName);    %class call

function_name=txt;
switch function_name
    case 'BEMT'
        X=struct('blades',myProp.N, 'r',myProp.r, 'hub_radius', myProp.h_r, 'velocity', myProp.v_inf, 'rpm',myProp.rpm);
    case 'Darrieus_flusso_moltiplo'
        X=struct('corda', myProp.c, 'R', myProp.r, 'blades',myProp.N,'Cd', myProp.Cd);
    case 'Axial_rotor'
        X=struct('r',myProp.r);
    case 'Ang_attacco_effetti'
        X=struct('theta',myProp.theta);
    case 'elica_intubata'
        X=struct('velocity',myProp.v_inf,'Thrust',myProp.T);
    case 'adim_coeff'
        X=struct('velocity',myProp.v_inf,'altitude',myProp.h,'blades', myProp.N);
    case 'Opti_Prop'
        X=struct('blades',myProp.N,'hub_radius',myProp.h_r,'tip_radius', myProp.t_r,'rpm',myProp.rpm,'altitude',myProp.h,'velocity', myProp.v_inf,'Thrust',myProp.T, 'Power', myProp.P);
    case 'RmyProp.v_infortexInt'
        X=struct('corda',myProp.c);
    case 'flappingangles'
        X=struct('velocity',myProp.v_inf, 'Lock number', myProp.lock_number,'R',myProp.r);
    case 'Cdcl_xfoil'
        X=struct('Reynolds number', myProp.Reynolds);
    case 'RotorFF'
        X=[]; %they only need in input the angle of attack
    case 'Axial_Descent_Ascent'
        X=struct('R',myProp.r);
    case 'Cdcl_xrotor'
        X=struct('Reynolds_number', myProp.Reynolds, 'f',myProp.f);

end

end
```