User Guide for PARSEC Airfoil Geometry Parameterization Code

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Abstract

This work has as object instruct the user to use the PARSEC code in Linux OS.

Introduction

The parsec airfoil generator is used for 2D curved airfoils and is a good tool in optimization studies, since it can easily modify the airfoil parameters to have a precise measurement of the aspects of a new airfoil.

The code was developed by SungKi Jung.

Chapter 1. Installation

To run the fortran code, the Linux OS system will be used in this user guide.

If Fortran isn't installed, this can be achieved typing in the terminal:

sudo apt install gfortran

Transfer the PARSEC files to a folder in your desktop.

Compile the fortran source code using the Linux OS system, for this, write the command as this order, below

gfortran PARSEC.F90 Invers.f90

Chapter 2. Usage instruction

In the parsec folder, open the PARSEC_Variables file

In this file, you can change the PARSEC parameters, each variable will change
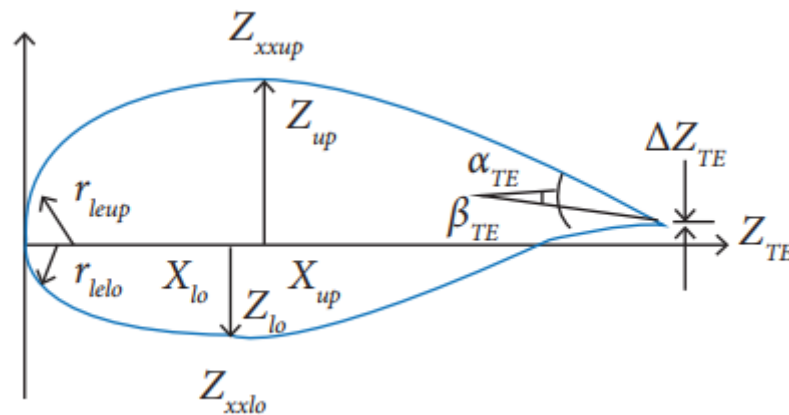a parameter in the airfoil as shown below.
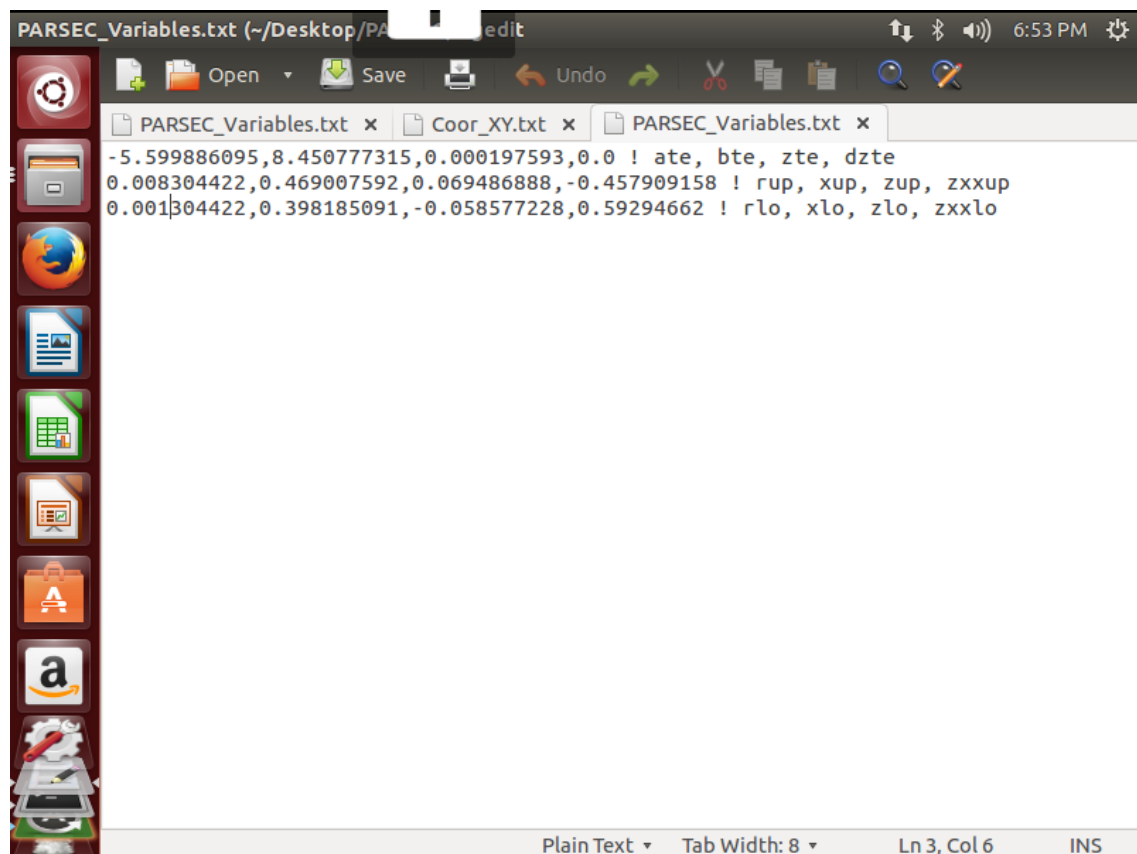

Figure 1. PARSEC variables..

Figure 2. PARSEC variables file.

After set the desired parameters, run the a.out file in the terminal and check the coor_xy file for the airfoil coordinates.

Reference

[1] An Implementation of Self-Organizing Maps for Airfoil Design Exploration via Multi-Objective Optimization Technique. JUNG, SungKi; CHOI, Won; MARTINS-FILHO, Luiz S. and MADEIRA, Fernando