Title of the MsC Thesis

Name of author
author.name@ist.utl.pt

Instituto Superior Técnico, Lisboa, Portugal

December 2011

Abstract

Place abstract here. No paragraph breaks.
Keywords: Keyword1, Keyword2, Keyword3, Keyword4, Keyword5

1. Introduction

Motivation and state-of-the-art...

Include relevant references [1].

2. Background

Place text here...

2.1. Sub-section...

A generic CFD design problem can be formally described as

$$\begin{aligned} \text{Minimize} \quad & Y(\alpha, \mathbf{q}(\alpha)) \\ \text{w.r.t.} \quad & \alpha\,, \\ \text{subject to} \quad & \mathcal{R}(\alpha, \mathbf{q}(\alpha)) = 0 \\ & C(\alpha, \mathbf{q}(\alpha)) = 0\,, \end{aligned} \tag{1}$$

where Y is the cost function, α is the vector of design variables and $\mathbf{q}$ is the flow solution, which is typically of function of the design variables, and $C = 0$ represents additional constraints that may or may not involve the flow solution. The flow governing equations expressed in the form $\mathcal{R} = 0$ also appear as a constraint, as the solution $\mathbf{q}$ must always obey the flow physics.

2.2. Sub-section...

More text...

3. Implementation

Place text here...

3.1. Sub-section...

More text...

3.2. Sub-section...

More text...

4. Results

Place text here...

4.1. Sub-section...

More text...

Figure 1 shows the contour of pressure on the hub and blade surface planes corresponding to the baseline blade geometry.

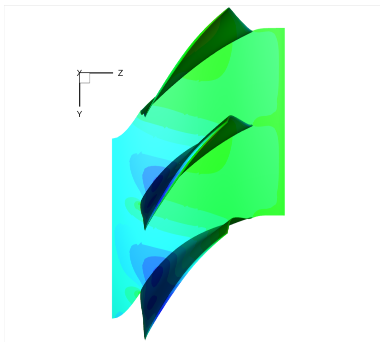

Figure 1: Pressure distribution.

As seen in Fig.1...

4.2. Sub-section...

More text...

Table 1 summarizes...

Model	C_L	C_D	C_{My}
Euler	0.083	0.021	-0.110
Navier–Stokes	0.078	0.023	-0.101

Table 1: Table caption

As seen in Tab.1...

5. Conclusions

Conclusions, future work and some final remarks...

Acknowledgements

The author would like to thank ...

References

[1] J. Nocedal and S. J. Wright. *Numerical optimization.* Springer, 1999.