



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Escola Superior d'Enginyeries Industrial,
Aeroespacial i Audiovisual de Terrassa

Study for the computational resolution of
conservation equations of mass,
momentum and energy. Possible
application to different aeronautical and
industrial engineering problems.

David Martínez Jiménez

Director:

Carlos David Pérez Segarra

Co-Director:

Asensio Oliva Llena

Budget of the Final's Degree Project

Grau en Enginyeria en Vehicles Aeroespacials

Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de
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Chapter 1

Budget

To overcome in a successfully way the project that has been done, a big amount of work hours have been needed. An estimation of the amount of work hours used has been done in order to calculate the cost of its development. They are going to be shown in Tab. 1.1.

Important to remark that computational hours have also been included on the time estimated per each task.

There is something also really important for the correct development of the project, the equipment used. The good part of this project is that a study has been done without the use of any real experiment, so the cost of the equipment related to it is much less. Just a computer (with its gadgets), the program for programming (there is open source programs, but I decided to work with *Visual Studio*, because of accessibility and debugging options) and for preparing the images or videos (open-source *Paraview*). Then, an estimation of the energy consumed during the development. The power consumption of the computer& screen & gadgets is estimated on 700W, and the electricity price per kWh is approximated to 0.12€.

Table 1.1: Accounting of the human part of the project

Work related				
Concept	Code	Duration (h)	Cost/hour (€/h)	Total cost (€)
Planning	1.1.1	5	10	50
Scheduling	1.1.2	5	10	50
Budget	1.1.3	5	10	50
Template design	1.1.4	15	10	150
Requirements definition	1.1.5	5	10	50
Project Charter	1.1.6	15	10	150
Results report	1.1.7	120	10	1200
Final modifications	1.1.8	10	10	100
Final revision	1.1.9	20	10	200
Total organization		200	-	2000
2D Transient	1.2.1	40	15	600
Validation	1.2.2	5	15	75
2D Circular Transient	1.2.3	20	15	300
Second Validation	1.2.4	5	15	75
3D Sphere Transient	1.2.5	60	15	900
Validation	1.2.6	10	15	150
3D Cube with fluid resolution	1.2.7	60	15	900
Validation	1.2.8	10	15	150
Convection-diffusion equation	1.2.9	60	15	900
Validation	1.2.10	20	15	300
Study Case	1.2.11	110	15	1650
Total programming		400	-	6000
TOTAL		600	-	8000

Table 1.2: Equipment cost

Equipment cost		
Concept	Quantity	Cost (€)
Computer& Gadgets	1	1000
C++ soft- ware	1	641
Energy	420	50,4
Total		1691,4

And for the total cost of the project, see Tab. 1.3.

Table 1.3: Total accounting of the project

Concept	Duration (h)	Cost (€)
Organization & Report	200	2000
Programming	400	6000
Equipment	-	1691,4
Total	600	9691,4

As always, the amount of hours per each part are suitable to be changed during the development of the project.