



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

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

Budget

Numerical resolution of the Navier-Stokes equations using unstructured meshes. Application to airfoils aerodynamics.

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Degrees: Aerospace Engineering and Industrial Engineering

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For the budget estimation of this project, three different aspects have been taken into account. The first one is the human resources, and the others are the computer resources and the electricity consumed.

Human resources: This study has been made by a last-year Engineering student. The price per hour for a junior engineer is about 20 euros per hour. Following the calendar presented, 615 hours have been dedicated to this project. That makes a cost of 12300 euros.

Computer resources: To do all the simulations, analyze the results and write the report of all this work, a LENOVO™ ideapad 110 with an Intel™ core i7 processor and a memory of 8GB computer valued in 650 euros has been used. The estimated life of this computer is about five years, and the time spent on doing this study was six months, so the amortization of the computer would cost 65 euros. All the different software does not cause an increase in cost, as the programming interface of C++ (Dev C++) is open, and with a student license, MATLAB and GiD no not have any cost.

Electricity: It is estimated that to do all this bachelor's final degree study the computer has been used for 2500 hours, most of them simulating. The consumption of a generic computer is about 80 Watts, so 200 KWh are consumed. The cost of electricity in Spain is 0,12159 euros/KWh so the total cost is 24,32 euros.

Concept	Cost (euro)
Human resources	12300
Computer resources	65
Electricity	24,32
Total	12389,32

So, the total cost of doing this bachelor's final degree study was 12389 euros.