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Internship Proposal
Development of Nanosat pre-sizing application
(5 or 6 months)

Supervisors: Jerome Puech, Thibault Gateau, Sophia Salas Cordero
Key-words: Mission Analysis, Preliminary design, Nanosatellite, Python

In order to design a nano-satellite for a specific mission, it is necessary to be able to perform trade-offs in order to fulfil requirements. The main goal is to determine the needed budgets by a system engineer (mass, power, data, battery DOD, link...) given the mission orbit parameters and needs. Such budgets are critical during the first phase (phase 0) of a Cubesat development as they allow to detect the main sizing issues to solve during the following design phase (phase A).

For now, each budget is computed using a specific software - IDM-CIC, Python, Matlab, Simulink ... , which requires manual data management between computations. Therefore, an automated tool to compute the main sizing parameters and manage all of them in a dedicated database would be a great advantage for a system engineer to quickly detect any issue during the design process.

The developed tools will be used on a real mission: CREME (Cubesat for Radiation Environment Monitoring Experiment), a CubeSat currently designed to measure radiation levels in the Van Allen Belts.

During the internship, the intern is expected to:

- Become familiar with the main existing sizing tools.
- Perform a system analysis in order to identify all data needed to design a NanoSat.
- Identify a global sizing process.
- Analyze how Inputs and Outputs from each submodule can interact with a database.
- Develop and manage database visualization tools (N2 diagram, design graphs, design structure matrixes...)
- Work on a concrete example (based on Creme data).

Technical Required skills: System engineering, Good programming skills (Python, Javascript/Angular would be an advantage), Satellite design and sizing process knowledge, experience with CubeSats would be appreciated, interest in the space domain is a must!

Personal Required skills: Rigorous, scientific curiosity, autonomous, initiative spirit.

Application: if interested, contact us by mail using the subject "[CREME] application for preliminary design tools internship".