- Moneyball Newsletter -

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31st of January 2024

On Monday the 8th of January, I began work on my PhD, Moneyball. To keep everyone informed about what's going on, and as a common reference for meetings, I made this newsletter template. Here's what you can expect in your inbox about once per month.

- Some nice Space pictures
- Progress update
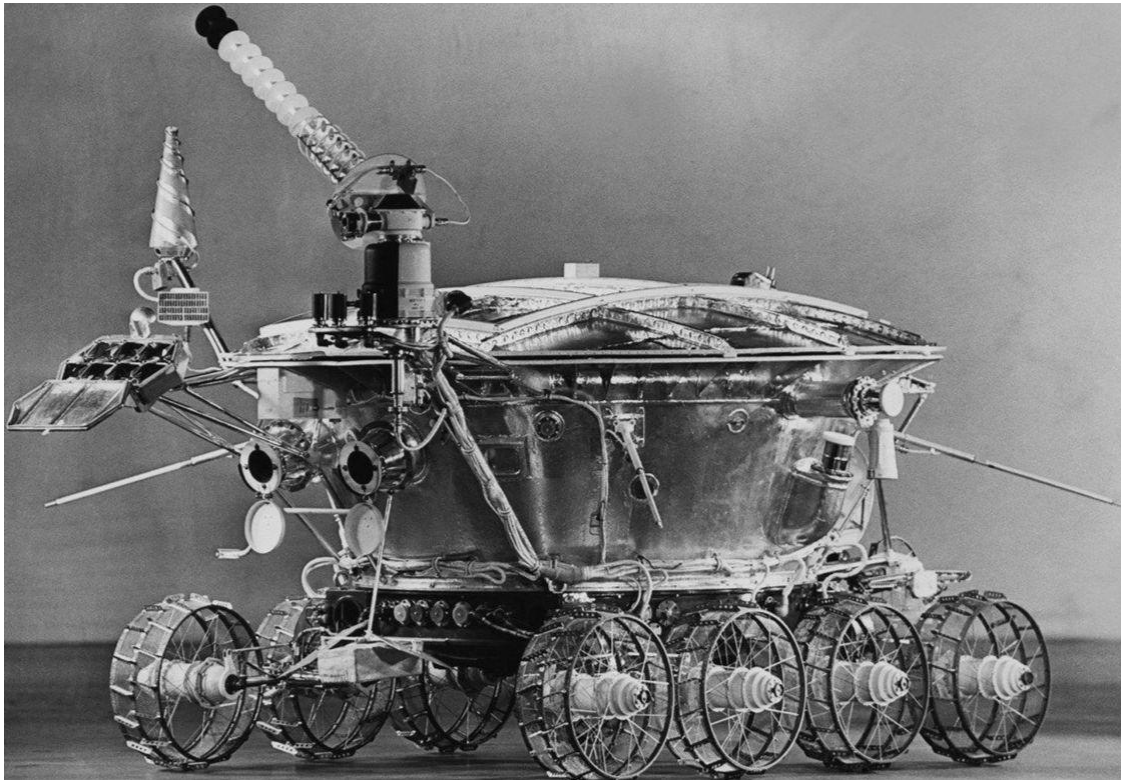- Meeting Log
- Outlook for next month

FIg. 1 Lunakhod 1 rover 1970. Early Soviet electronics were not adapted to work in a vacuum so the main body of the rover is in fact a pressurized bucket.

PROGRESS REPORT

Moneyball organisational structure

Below is an organigram of the current structure of the project. Alten and Supaero are the two partners. The main source of funding will be the CIFRE grant from the ANRT.
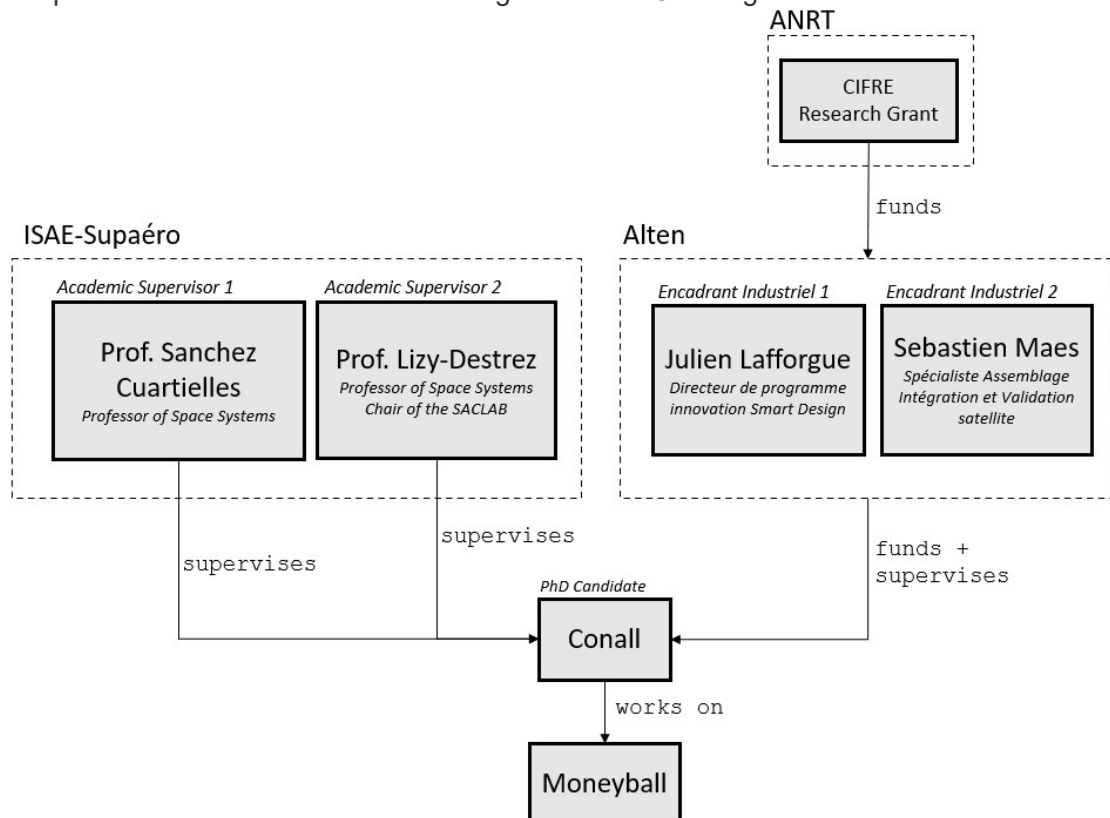

Fig. 2 Organigram of Moneyball

CIFRE dossier status

At the time of writing, The application to the CIFRE grant has not yet been submitted. All of the elements have been collected and there remain a few final details to collect on the Alten side before submission. Currently, I am employed by Alten to work on the Moneyball project at Supaero although I am not enrolled in the EDSYS doctoral school. Enrollment is dependant on the CIFRE grant which will take an unknown number of months to arrive.

Integration at Supaero and Timesharing

For the first six months of the PhD it has been agreed that I will work approximately 90% at Supaero and 10% at Alten in Saint-Martin du Touch. At Supaero I have a desk at the Space Advanced Concepts Laboratory in the Département Conception et Conduite des Véhicules Áeronautique et Spaciaux.

Ideation with XDSM diagrams

Extended Design Structure Matrices are a standard way of describing MDAO problems. Below is a rendering of the moneyball methodology in this framework.
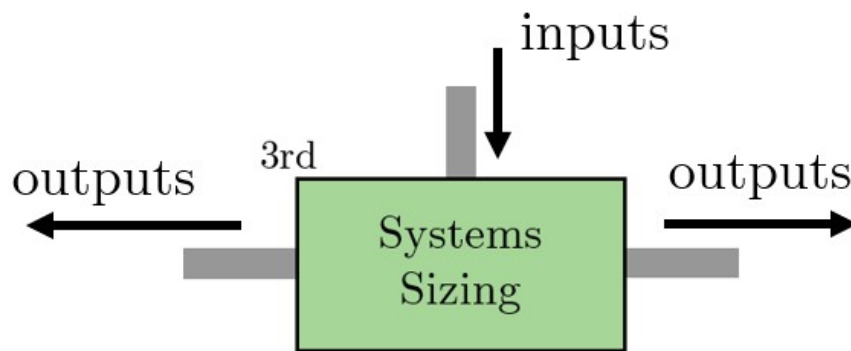

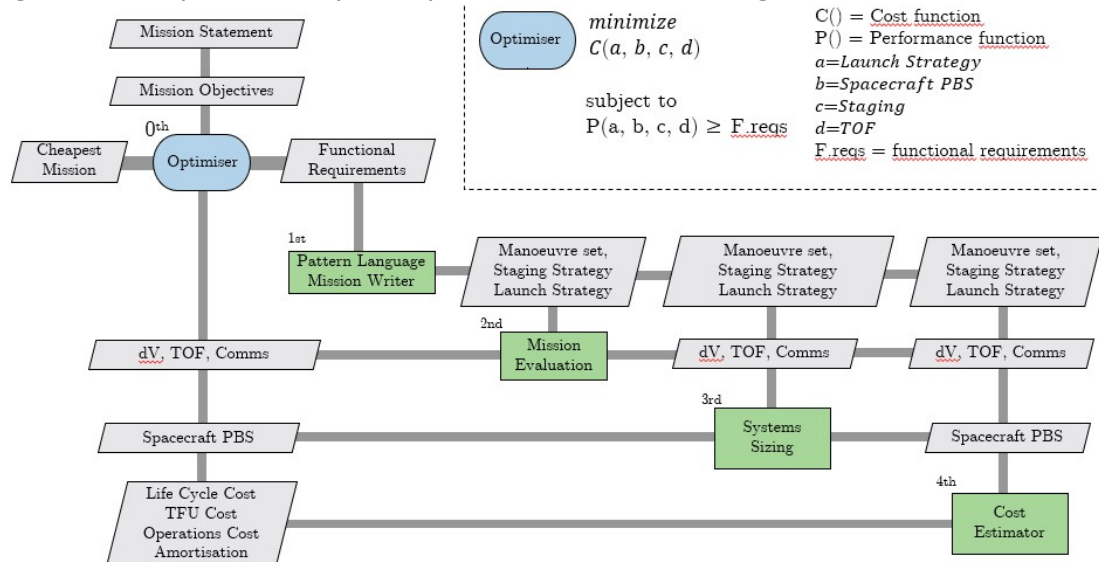*Fig. 3 An Example of a discipline represented in an XDMS diagram.*

Fig. 4 The Moneyball methodology represented as an XDMS diagram.

A first draft of the optimisation problem that is the moneyball methology. The green boxes are the disciplines, grey boxes are inputs and outputs, and the paths between them represent information flow. The objective function is the life cycle cost of the mission. Not

all of the disciplines will take up an equal share of the work of the PhD. The project will likely focus on the pattern language and the cost estimation disciplines.
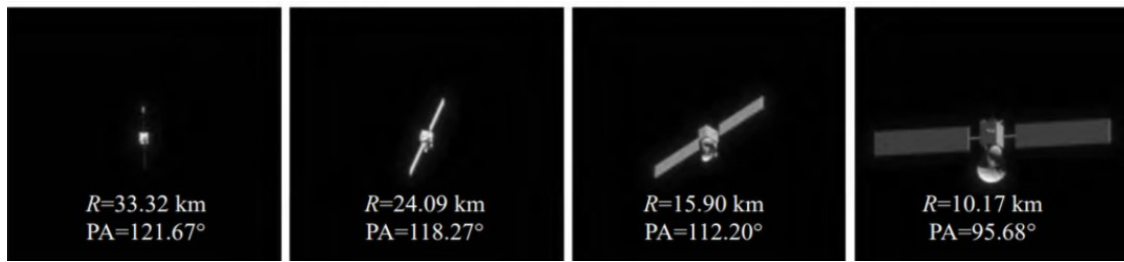
Fig. 5 An American satellite approaching and inspecting a Chinese GEO communications satellite at close range in 2020. Pictures published in protest by the CNSA.

MEETING LOG

A log of all scheduled meetings had this month with their subjects. informal meetings not included.

Friday 12th: Professor Sanchez:
Integration to the SACLAB, Co-supervision arrangement, ETH collab idea.

Tuesday 16th: Professor Lizy-Destrez:
Integration to SACLAB, ETH collab.

Friday 19th: Professor Lizy-Destrez:
Integration to SACLAB Suggested Reading, ETH collab.

Friday 19th: Jean-luc Clavel:
ETH collab.

Friday 26th: Sebastien Maes:
Introductions, Co-supaervision arrangement.

Friday 26th: Jean-luc Clavel, Julien Lafforgue, Margot Raynal :
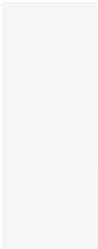ETH collab.

Monday 29th: Professor Sanchez.
XDSM diagram, Pattern languages, ESA OSIP attempt 2, IAC 2024.

OUTLOOK

After integration to the SACLAB, February is for:
 - Developing the scope of the PhD,
- Abstract for IAC 2024,
 - Exchanging more with fellow SACLAB researchers,
 - Organising a tri-partite meeting between Sebastien Maes, Professor Sanchez and Professor Lizy-Destrez about Alten's supervision contribution,
 - CIFRE dossier submission and advancing enrollment in the école doctorale,
 - Working days at Alten: Friday 9th and Friday 23rd of February.

That's the news for January.

Thank you for a good start.
Sincerely,
Conall