MDI210 : Numerical Analysis and Continuous Optimization

Robert M. Gower

TELECOM ParisTech

Who am I?

Robert M. Gower

- **Assistant prof at Telecom**
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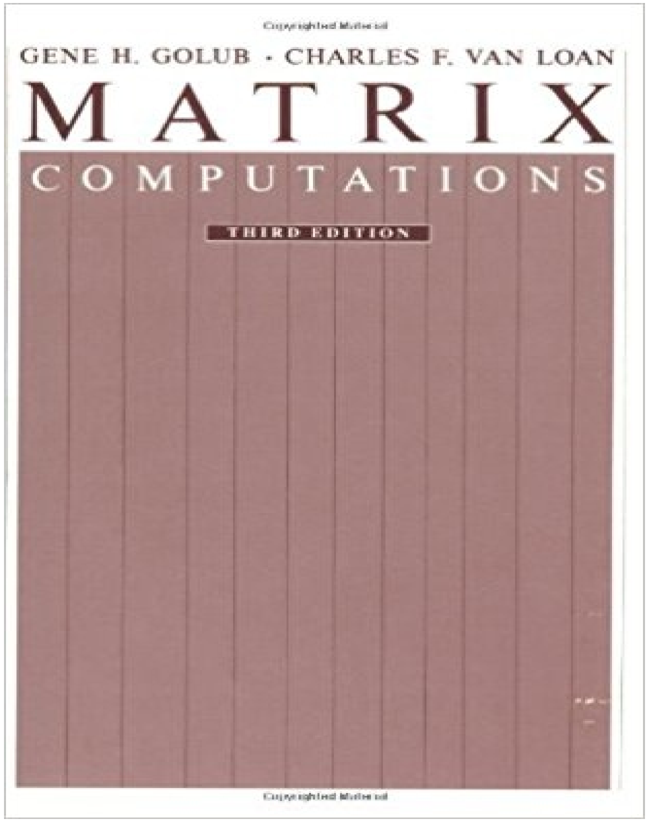
- **https://perso.telecom-paristech.fr/rgower/**
- **Research topics: Stochastic algorithms for optimization, numerical linear algebra, quasi-Newton methods and automatic differentiation (backpropagation).**

Core Info

- **Where** : Telecom ParisTech
- **Location**: Amphi Jade
- **Volume** : 28h
- **When** : 8 weeks
- **Exam: One exam** on … approx 31st of October
- **Online:** Find lecture notes on my homepage

  https://perso.telecom-paristech.fr/rgower/teaching.html
- **Exercices:** Do all exercises in the MDI210 lecture notes

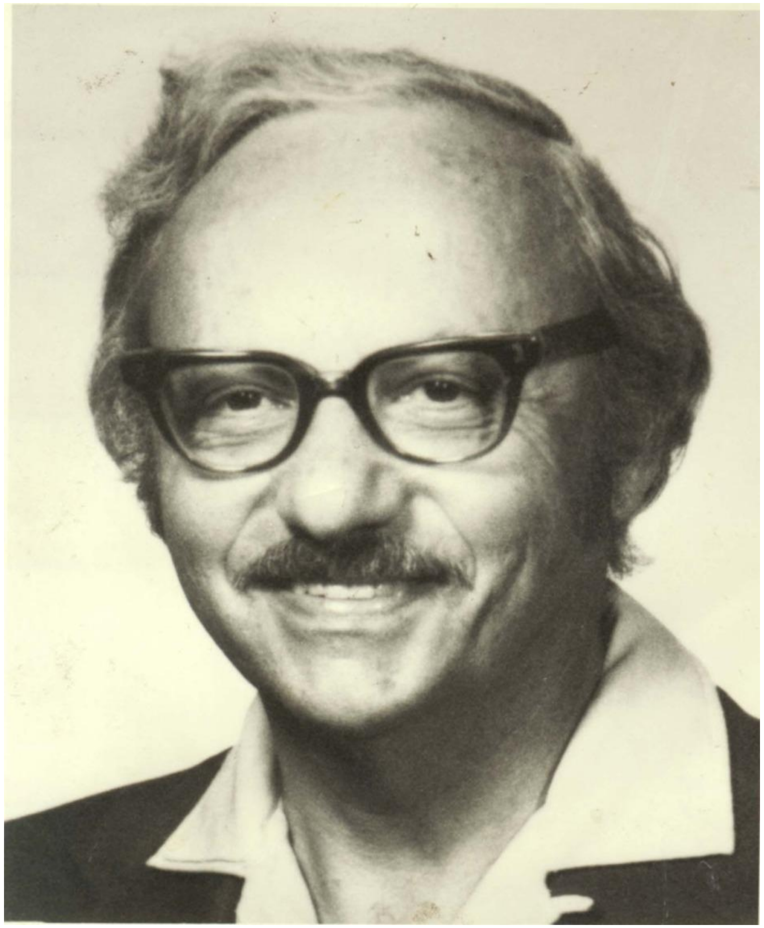
Additional References for Numerical Analysis



Matrix Computations:
Gene H. Golub and
Charles F. Van Loan

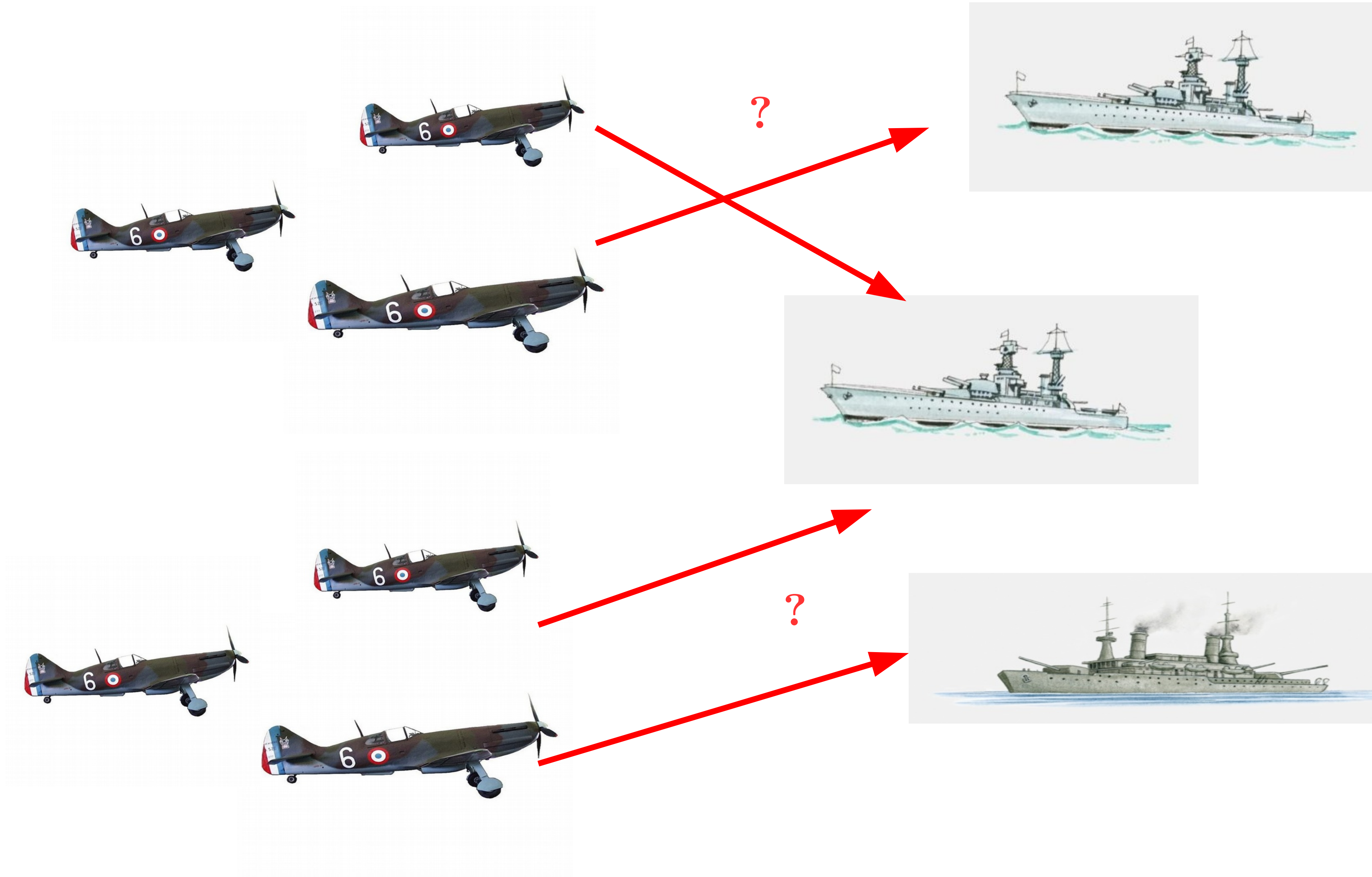
Three copies in the library on the 8th floor!

Linear Programming History (1939)

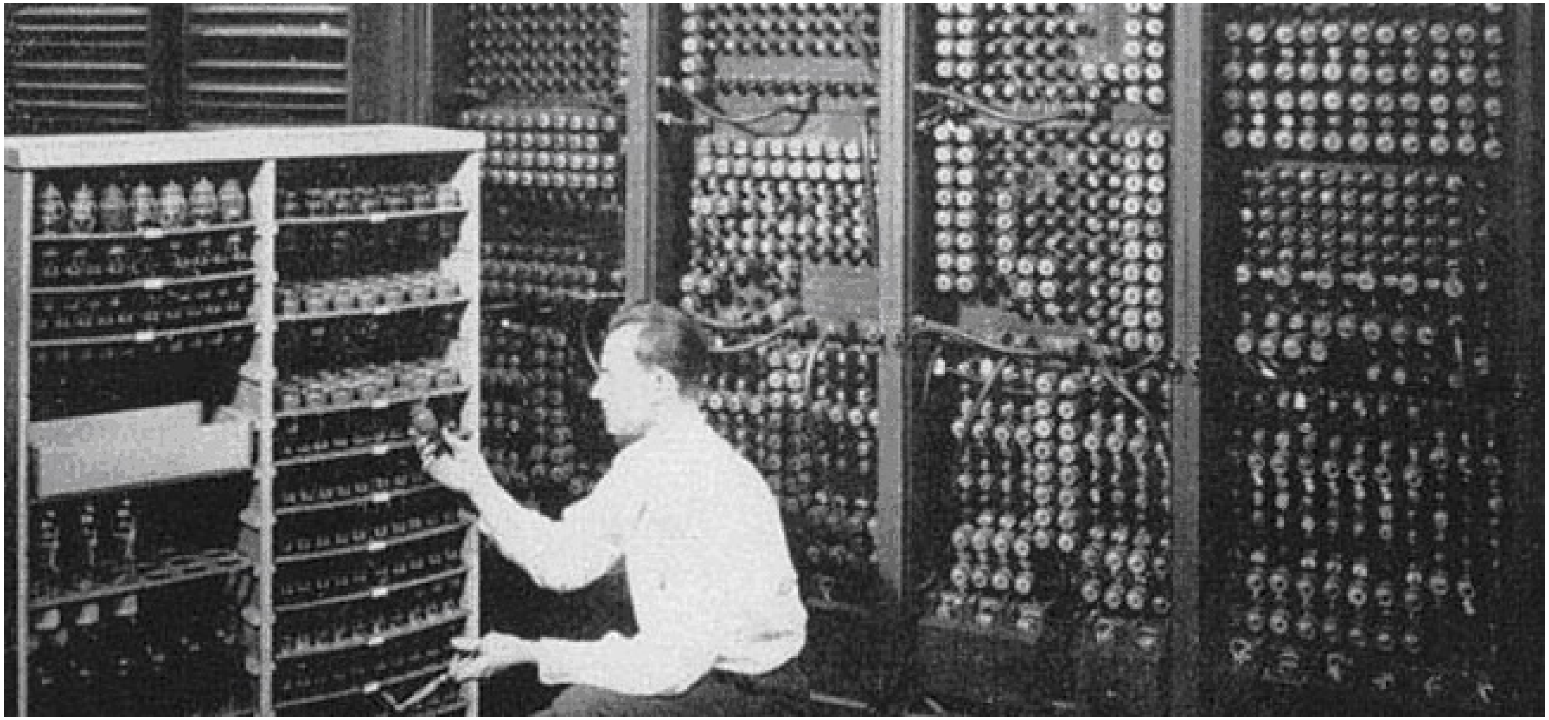


- 1947: George Dantzig, advising U.S. Air Force, invents Simplex.
- Assignment 70 people to 70 jobs (more possibilities than particles).

Linear Programming History (1941)



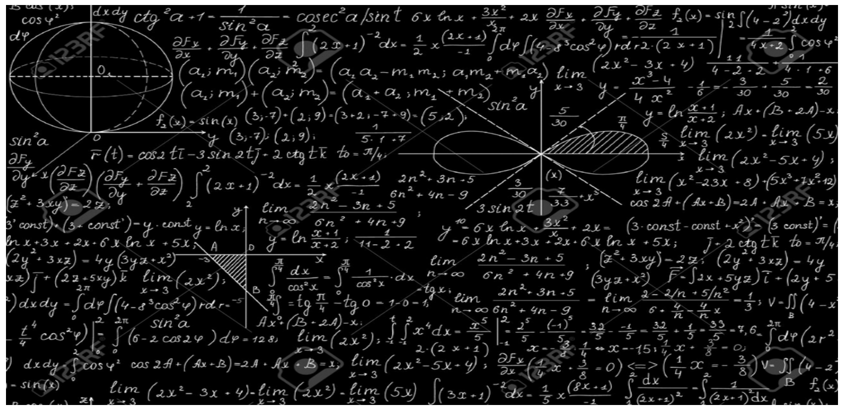
Army Builds Killing Machine (1949)



1949 SCOOP: Scientific Computation Of Optimal Programs

Mathematical Programming: Math used to figured out Flight and logistic programs/schedules

Dantzig the Urban Legend



Dantzig, George B. "On the Non-Existence of Tests of 'Student's' Hypothesis Having Power Functions Independent of Sigma." Annals of Mathematical Statistics. No. 11; 1940 (pp. 186-192).

Dantzig, George B. and Abraham Wald. "On the Fundamental Lemma of Neyman and Pearson." Annals of Mathematical Statistics. No. 22; 1951 (pp. 87-93).