

# The Lanczos Algorithm

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# Outline of talk

- 1 Introduction
- 2 The Algorithm
- 3 Applications

## 1 Introduction

## 2 The Algorithm

## 3 Applications

# Introduction

# Brief History

The Lanczos algorithm was developed by Cornelius Lanczos. He developed the method while working at Boeing in the 40s. It was then forgotten for a number of years due to the lack of computers meaning that it couldn't be properly utilised. When it was then “rediscovered” it was modified multiple times to fix some instability issues.

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## 2 The Algorithm

## 3 Applications

The Lanczos Algorithm is used to solve large scale eigenvalue problems. So give a large  $n \times n$  matrix  $A$  we have:

### Eigenvalues and eigenvectors

$$Av_i = \lambda_i v_i$$

Where the vectors  $v_i$  are the eigenvectors and the scalars  $\lambda_i$  are the eigenvalues.

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Thank you!