TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

MF TUTORIAL PART 0

Introduction

Sibylle Hess and Michiel Hochstenbach

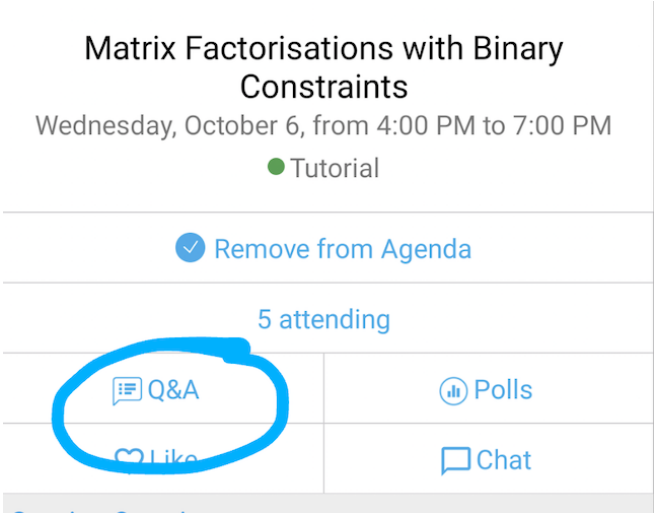
OUTLINE

15:00 - 15:05	Intro
15:05 - 15:25	SVD and Eigendecompositions *(5min Q&A)*
15:25 - 15:40	NMF *(5min Q&A)*
15:45 - 16:00	**BREAK**
16:00 - 16:20	Clustering - k-means *(5min Q&A)*
16:20 - 16:45	Clustering - Nonconvex *(5min Q&A)*
16:45 - 17:00	**BREAK**
17:00 - 17:30	Biclustering *(5min Q&A)*
17:30 - 17:50	Where else to go from here?

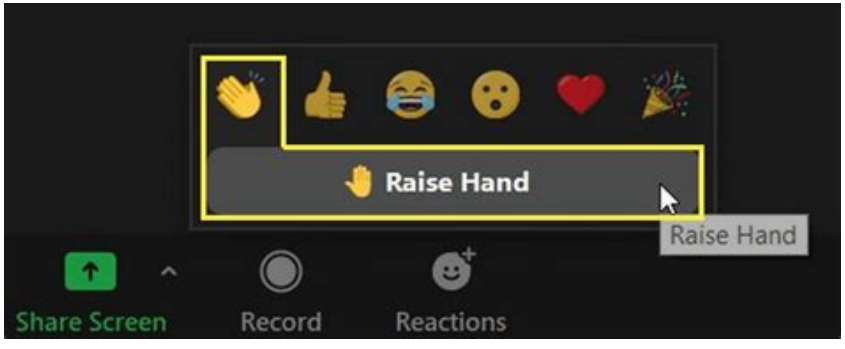
PARTICIPATION

I'd be happy to take your questions and comments!

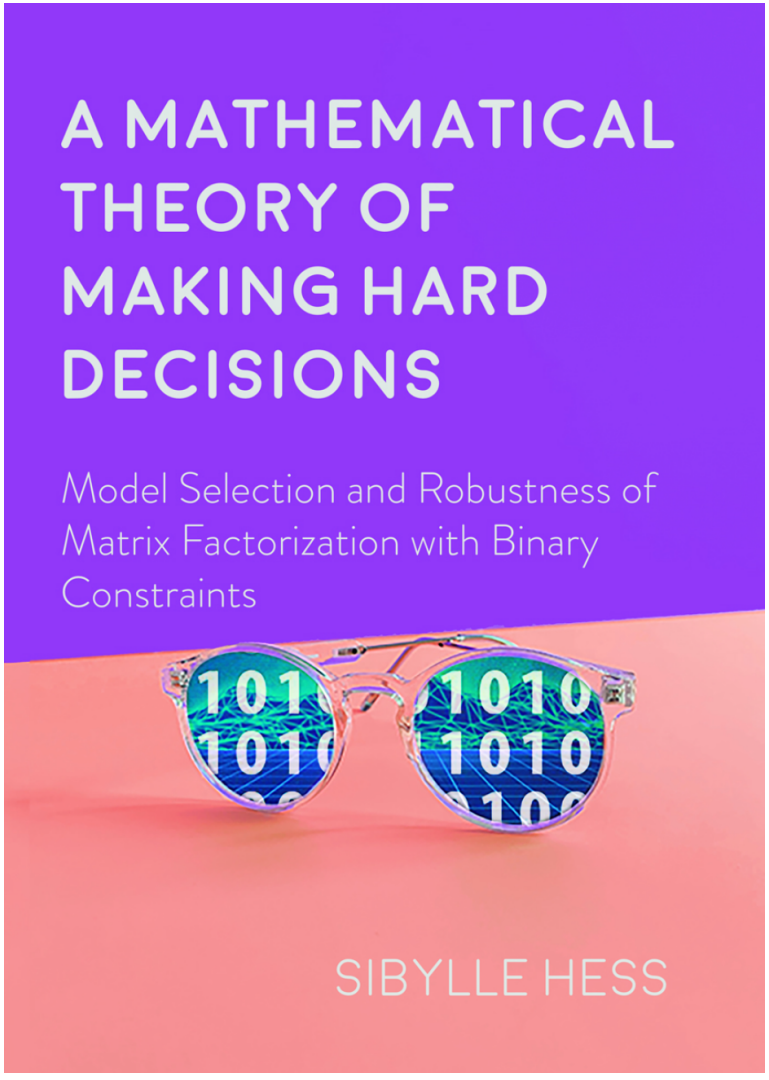
Put your questions in the Whova Q&A chat



Raise your hand in Zoom



BASIS FOR THIS TUTORIAL



If you want to read up on the proofs of results presented here and have a more detailed overview of the matrix factorization zoo, have a look at Sibylle's dissertation (especially Chapters 2 and 3)

Link to PDF

DISCLAIMERS

- We will give our own **IMPRESSIONS** based on our own experience, but that doesn't mean that this is the only view
- The presented **LITERATURE** is only a **REPRESENTATIVE SAMPLE**
- If you think that we **MISSED A PAPER** or a viewpoint, please **CONTACT** us, we will update the slides and videos:

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THE SCOPE

ONE OBJECTIVE TO RULE THEM ALL:

$$\min_{X,C,Y} \|D - YCX^\top\|^2$$
$$\text{s.t. } (X, C, Y) \in \mathcal{F} \subseteq \mathbb{R}^{m\times k} \times \mathbb{R}^{k\times k} \times \mathbb{R}^{n\times k}$$

WITHIN SCOPE:

- Comparison of connected MF learning tasks
- Trends and advances in optimization for MF (focus: handling binary constraints)

OUT OF SCOPE:

- MF for specific data types (text, audio, image, ..)
- Encyclopedic overview of methods

LET'S START