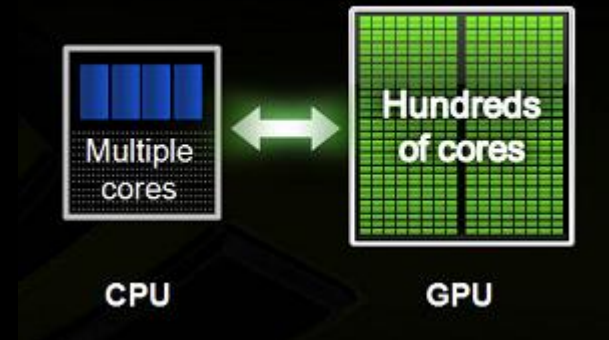
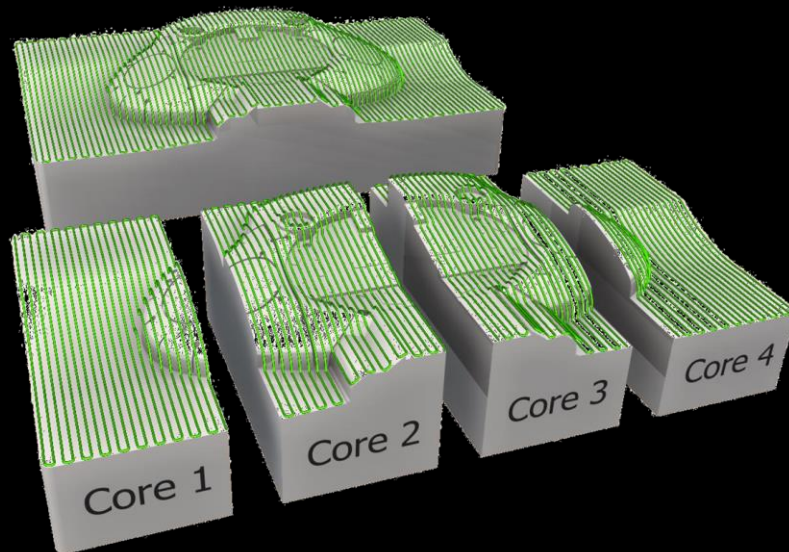
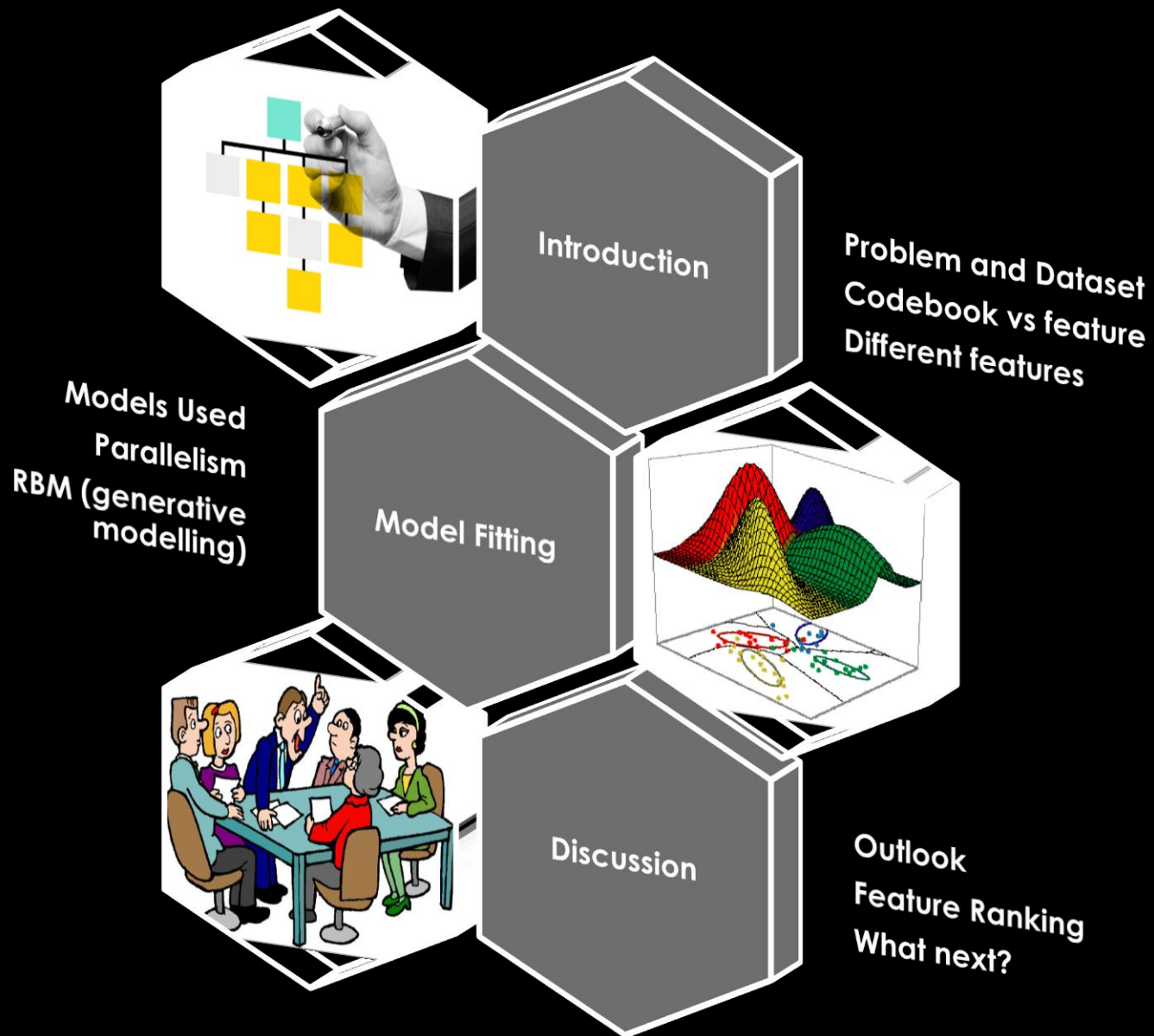


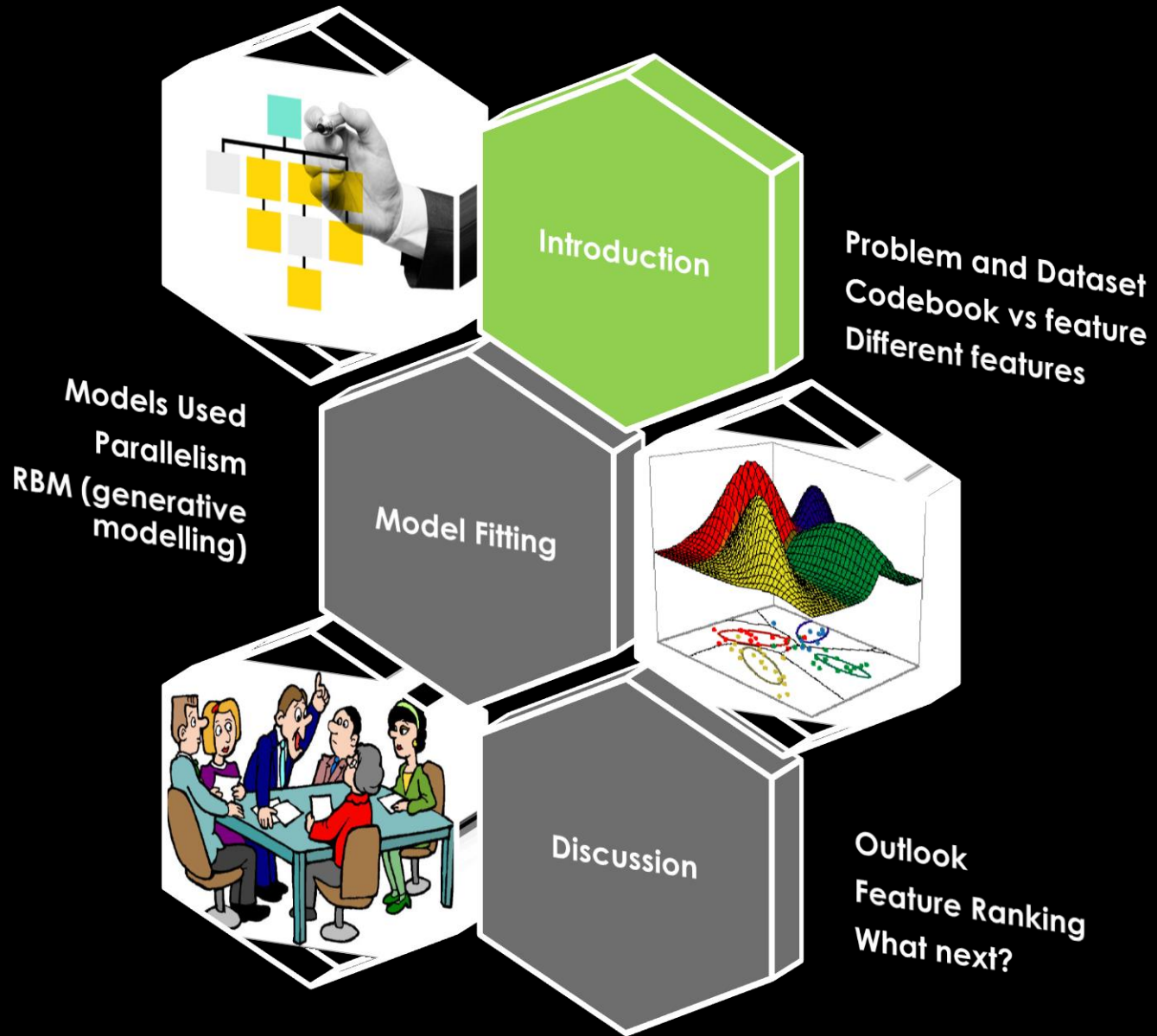
PARALLEL FRAMEWORK FOR AUTHOR IDENTIFICATION

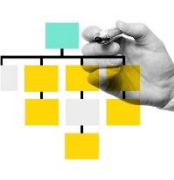
EXPLOITING PARALLELISM ON CPU AND GPU TO TRAIN MODELS IN PARALLEL

- PRAVEEN KULKARNI









Introduction

Problem and Dataset Codebook vs feature Different features

ICFHR 2012 Competition on Writer Identification Challenge 2: Arabic S...

Authors: A. Hassaine, S. Maadeed



[View research catalog entry for this paper](#)

Proc. Title: *2012 International Conference on Frontiers in Handwriting Recognition*

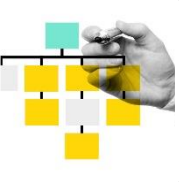
Year: 2012

Pages: 835-840

وغالباً يفتح عن حركات الصلابة الحركية في الأسبوسيفر والتي تحرك الصانع
القارية متسببة في حدوث هزات الزلازل. إلا أن مختلف المناطق الموجودة
على خط الزلازل تأخذ حوما التدابير الاحترازية.

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Introduction

Problem and Dataset Codebook vs feature Different features

Codebook based

- Based on graphemes
- Methods differ based on segmentation techniques
- Needs more data

Feature based

- Based on geometrical, structural and textural features
- Methods based on extracting different features and building PDF
- Useful for less data



Introduction

Problem and Dataset Codebook vs feature Different features

A Set of Geometrical Features for Writer Identification

Authors: A. Abdelâali Hassaine, Somaya Al-Maadeed



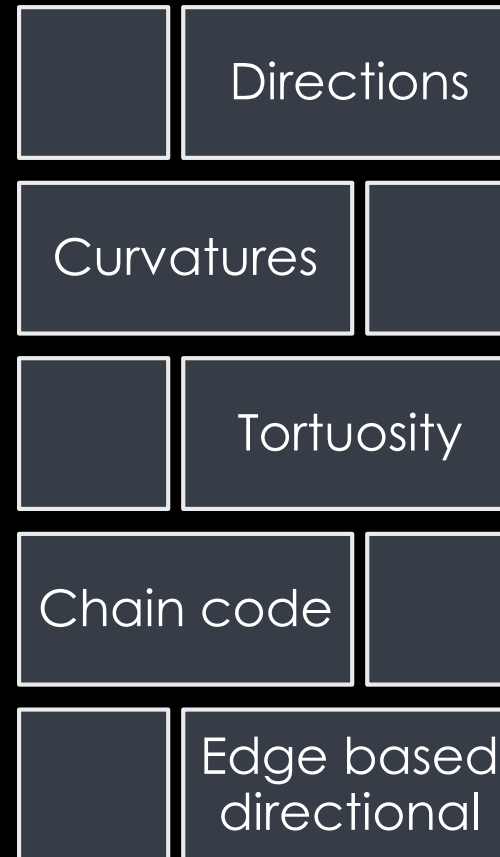
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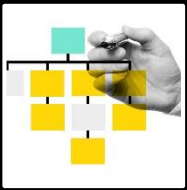
Book: *Volume 7667 of the series Lecture Notes in Computer Science*

Year: 2012

Volume: 7667

Pages: pp 584-591





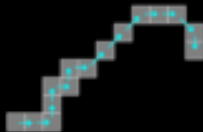
Introduction

Problem and Dataset
Codebook vs feature
Different features

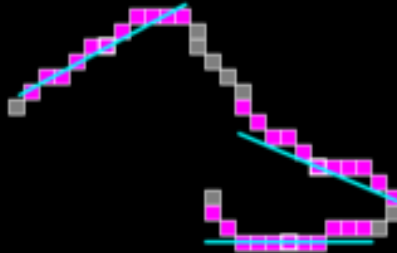
Directions



(a)



(b)



(c)



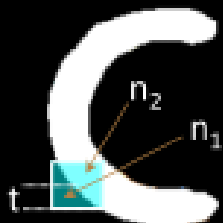
(d)



Introduction

Problem and Dataset
Codebook vs feature
Different features

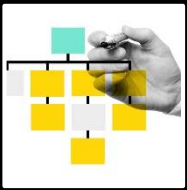
Curvatures



(a)



(b)

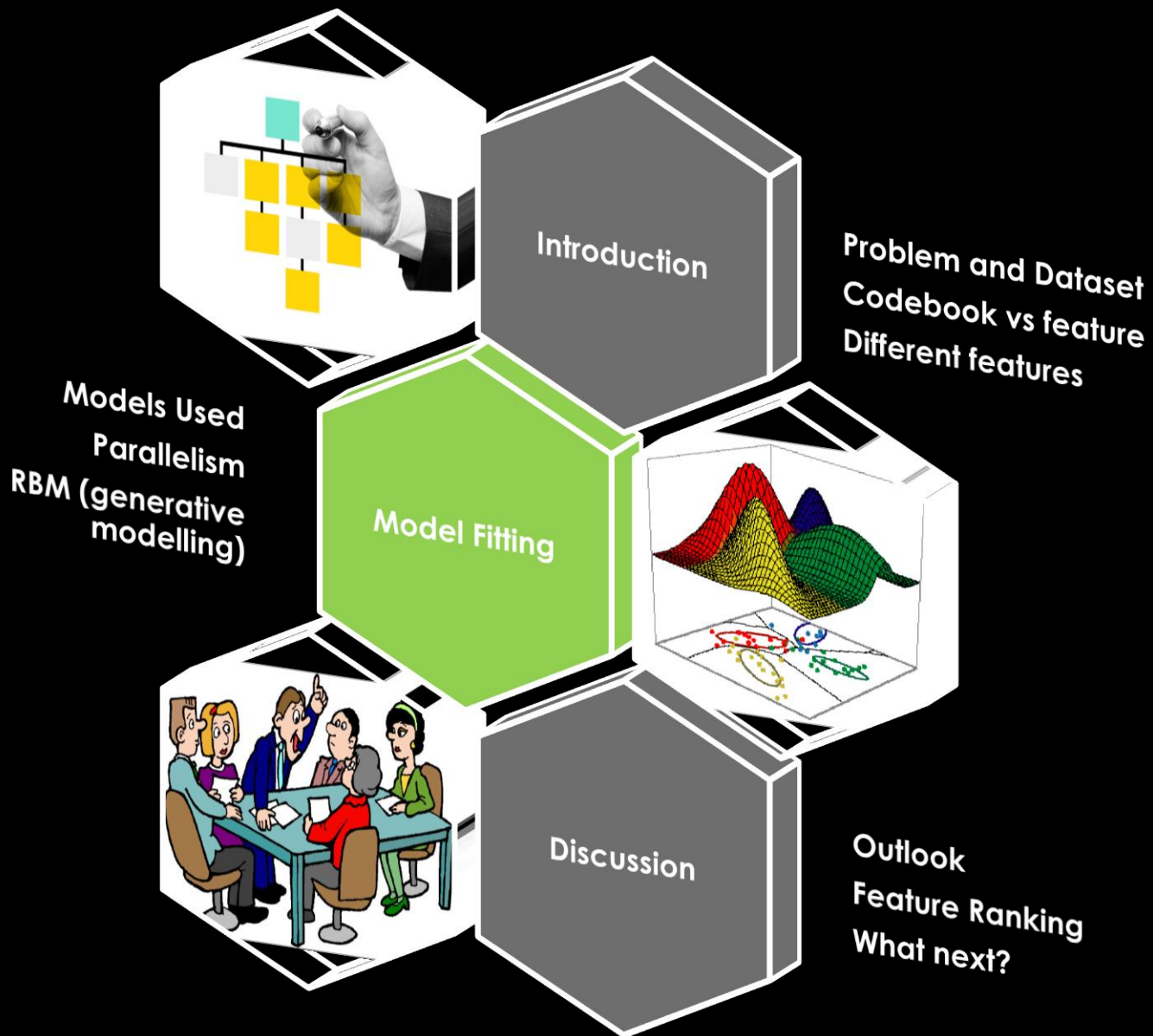


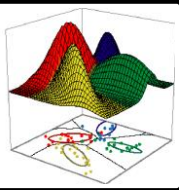
Introduction

Problem and Dataset
Codebook vs feature
Different features

Tortuosity





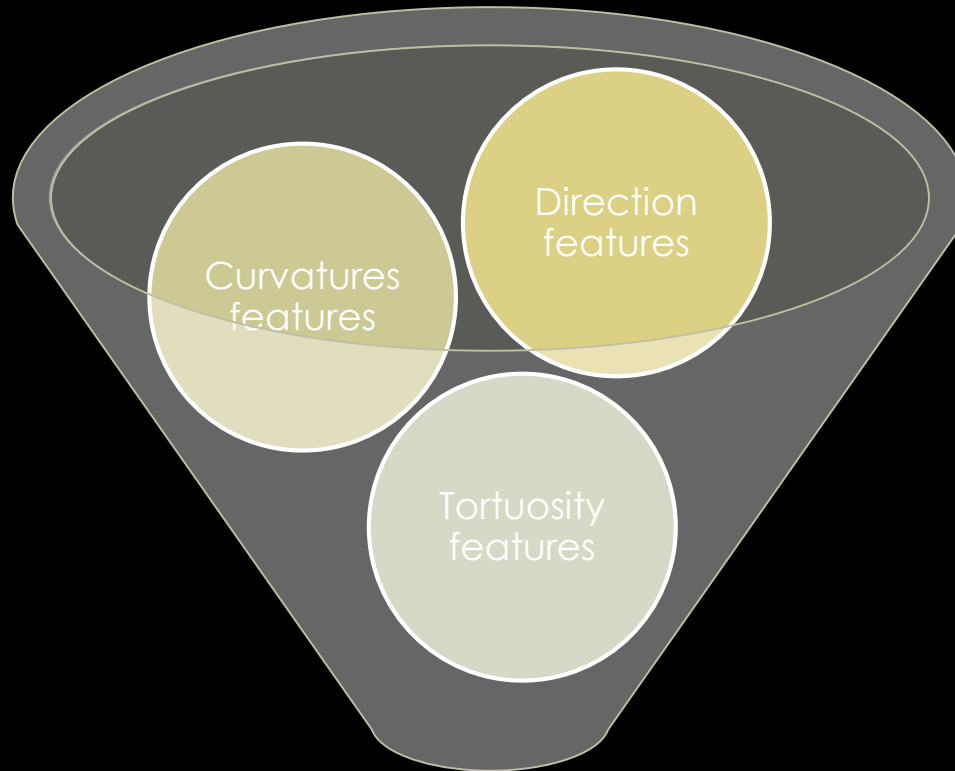


Model Fitting

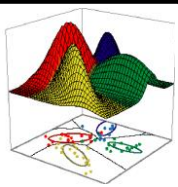
Models Used

Parallelism

RBM (generative modelling)



Classifier

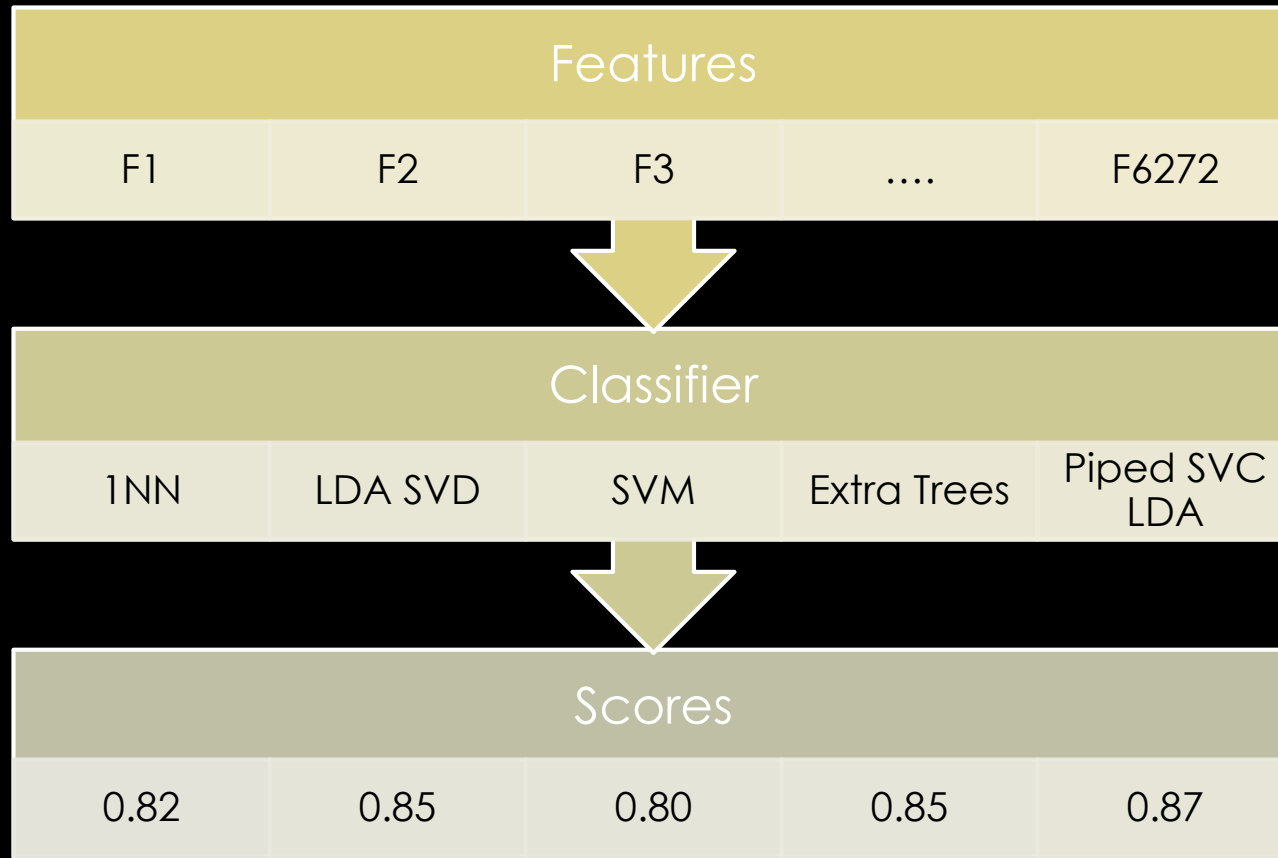


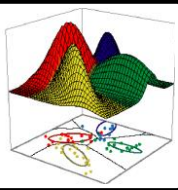
Model Fitting

Models Used

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Model Fitting

Models Used

Parallelism

RBM (generative modelling)

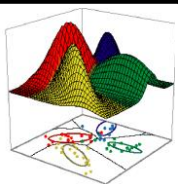
Combining Estimators

Feature Union

- Composite feature spaces:
Concatenating multiple feature extraction methods

Pipeline: chaining estimators

- Example: PCA does an unsupervised dimensionality reduction, while the logistic regression does the prediction

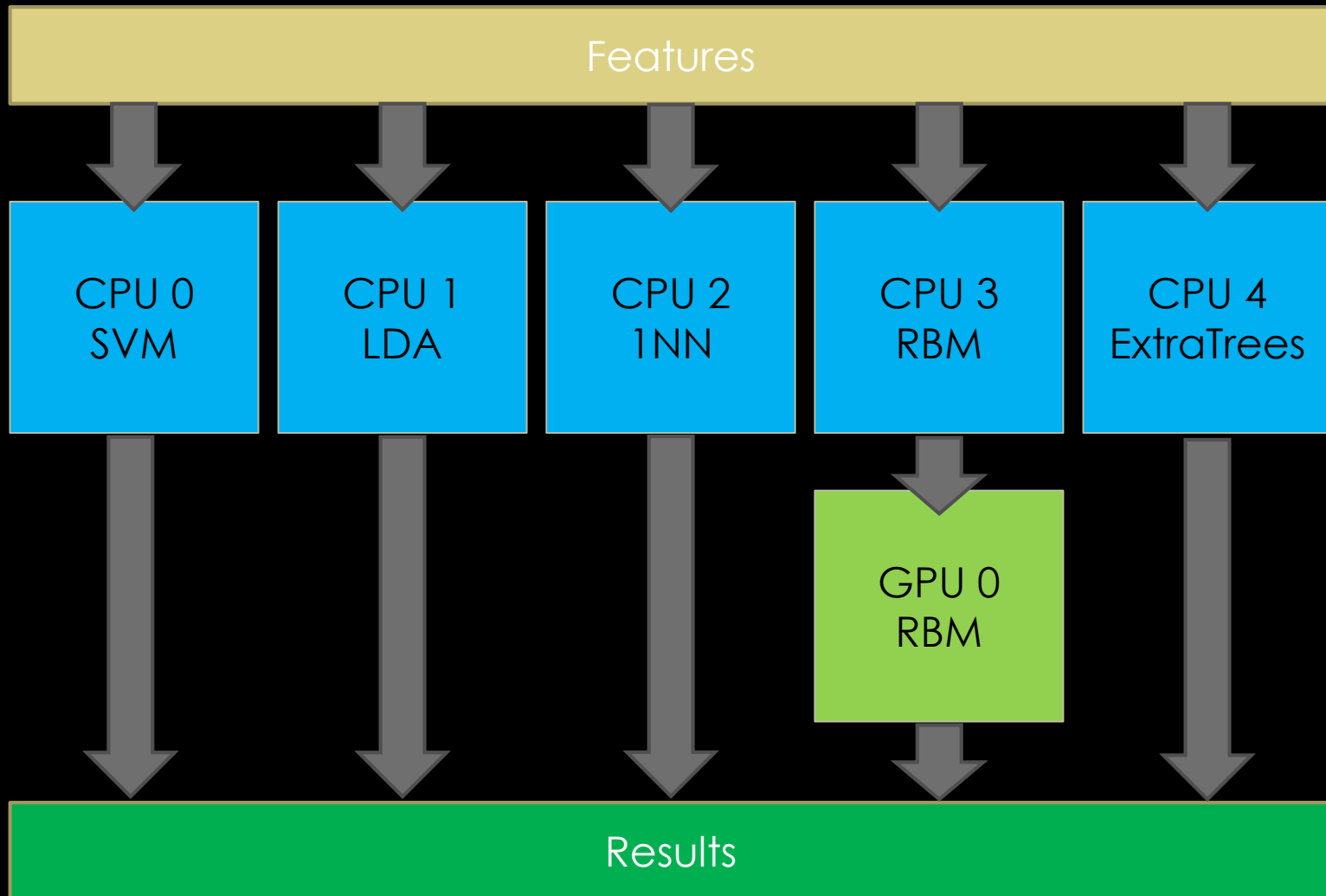


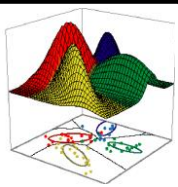
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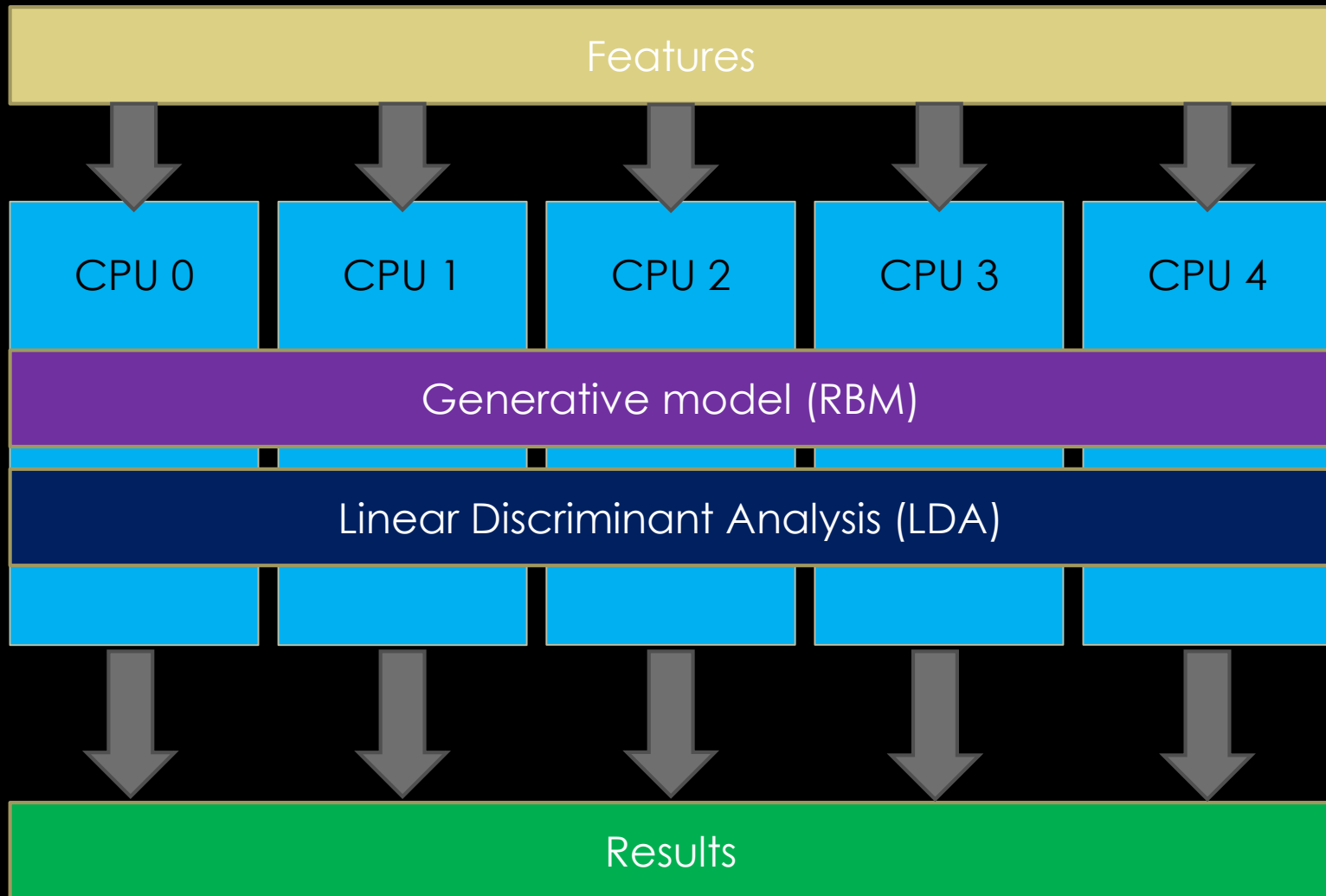


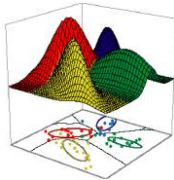


Model Fitting

Models Used
Parallelism

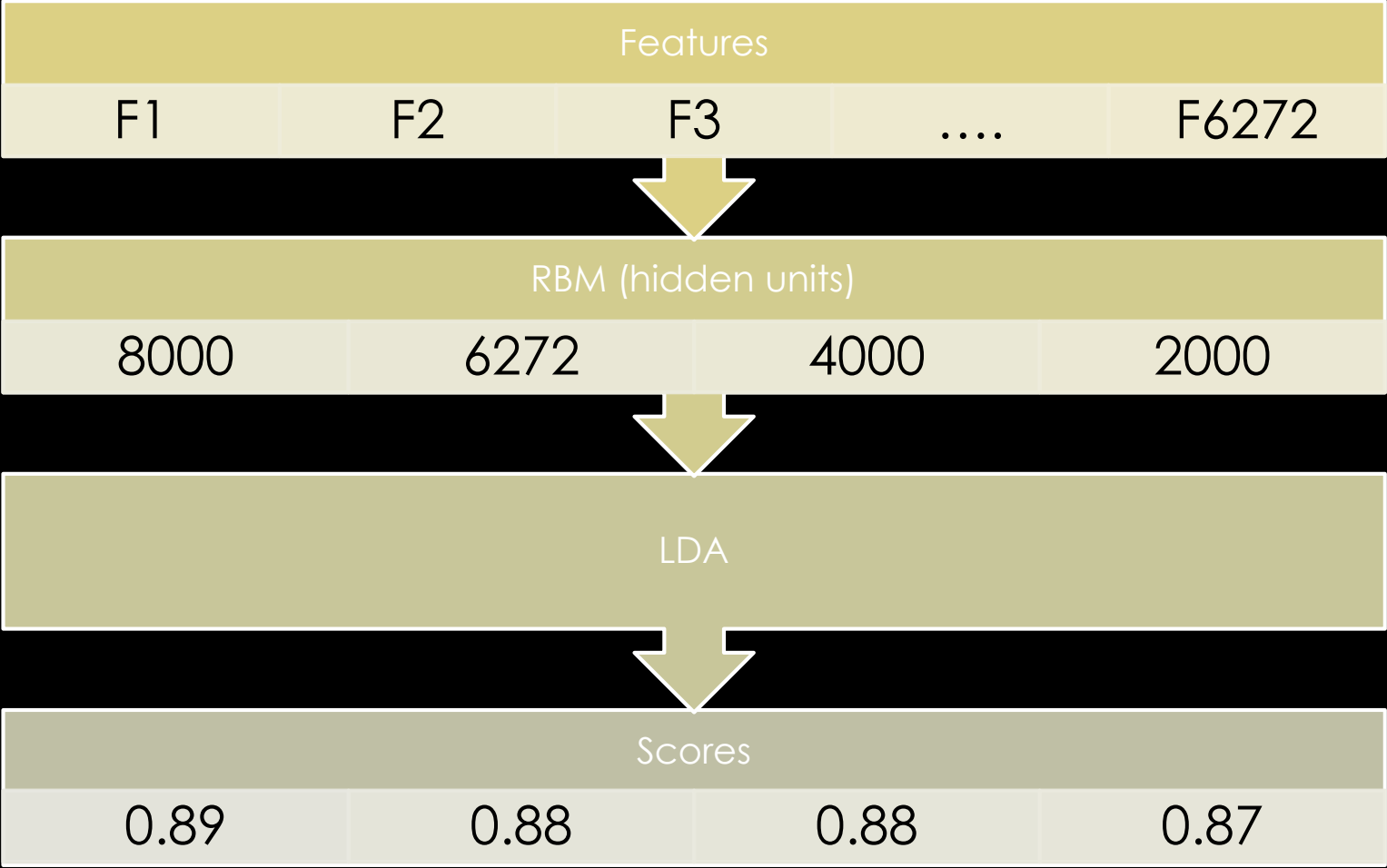
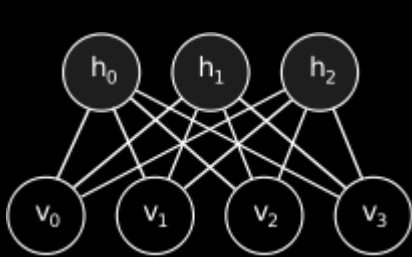
RBM (generative modelling)

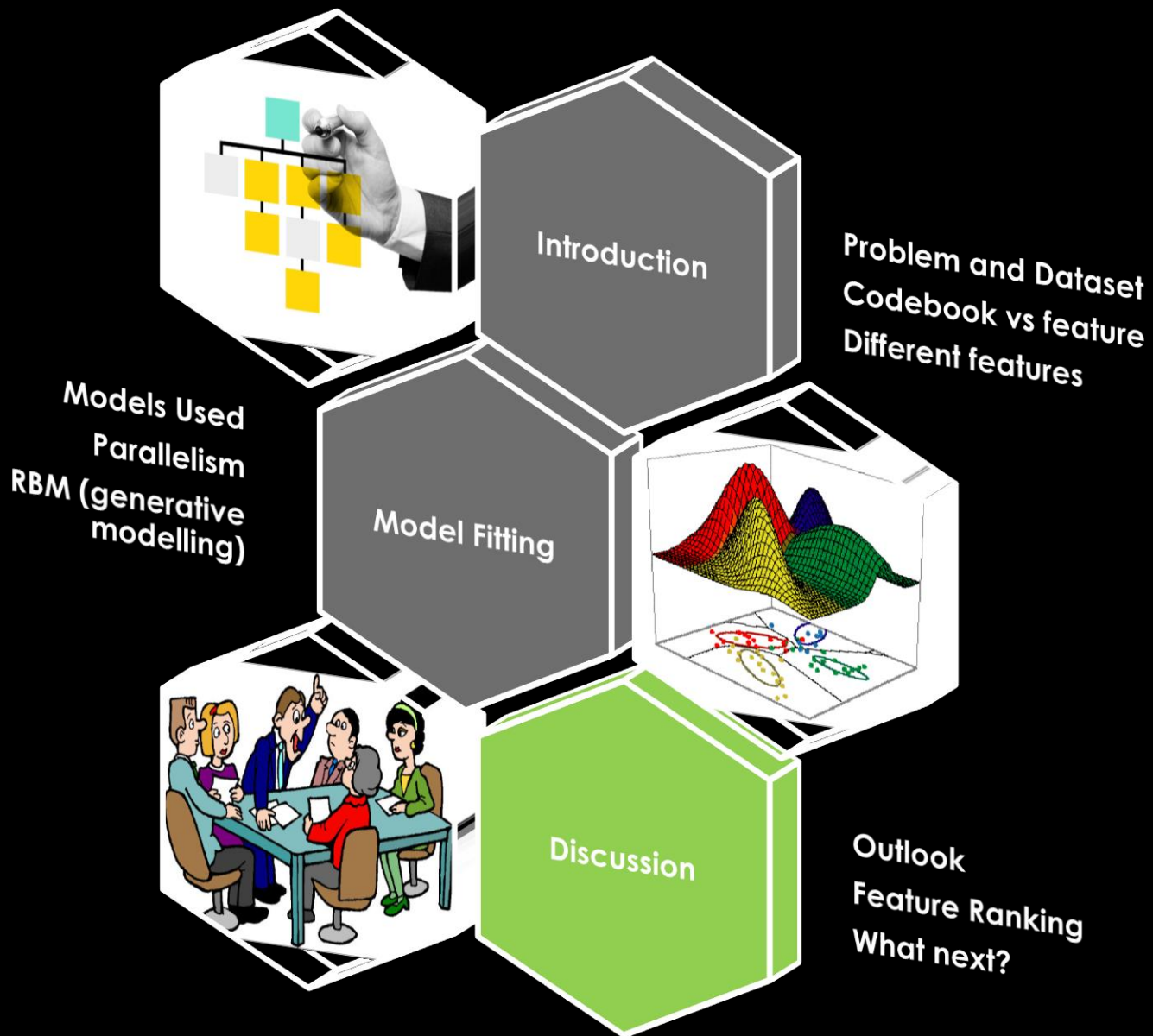




Model Fitting

Models Used
Parallelism
RBM (generative modelling)







Discussion

Outlook Feature Ranking What next?

Trying different classifiers

Combining estimators

- Feature Union
- Chaining estimators

Unsupervised learning

- RBM

Parallel framework

- Exploit multi cores on CPU and GPU to train models in parallel



Discussion

Outlook
Feature Ranking
What next?



Feature Ranking & Feature Selection



Discussion

Outlook
Feature Ranking
What next?



Feature Ranking & Feature Selection

danke !

●	Authors	Title	Year	Published In
●	Abdelâali Hassaine, So...	A Set of Geometrical Features for Writer Identification	2012	Volume 7667 of the series Lect...
●	Almazán, Jon; Gordo, ...	Efficient Exemplar Word Spotting	2012	Proceedings of the British Mac...
●	Bulacu, M.; Schomaker...	Writer identification using edge-based directional features	2003	Seventh International ...
●	Daniels, Zachary a.; Ba...	Discriminating features for writer identification	2013	Proceedings of the Internatio...
●	Fecker, Daniel; Asi, Ab...	Document Writer Analysis with Rejection for Historical Arabic Manuscripts	2014	2014 14th International ...
●	Fiel, Stefan; Sablatnig...	Writer identification and writer retrieval using the fisher vector on visual vocabularies	2013	Proceedings of the Internatio...
●	Hassaine, Abdelaali; Al ...	ICDAR 2013 Competition on Gender Prediction from Handwriting	2013	2013 12th International ...
●	Hassaine, Abdelaali; M...	ICFHR 2012 Competition on Writer Identification Challenge 2: Arabic Scripts	2012	2012 International ...
●	Hertel, Caroline; Bunk...	A Set of Novel Features for Writer Identification	2003	Audio- and Video-Based Bi...
●	Louloudis, G.; Stamato...	ICDAR 2011 Writer Identification Contest	2011	Document Analysis and R...
●	Maadeed, Somaya Al; ...	QUWI: An Arabic and English handwriting dataset for offline writer identification	2012	Proceedings - International ...
●	Marti, U. V.; Bunke, H.	The IAM-database: An English sentence database for offline handwriting recognition	2003	International Journal on Do...
●	Pratikakis, Ioannis; Gat...	ICDAR 2011 Document Image Binarization Contest (DIBCO 2011)	2011	Proceedings of the Internatio...
●	Thomas, Anil	Winner ICDAR2013 - Gender Prediction from Handwriting	2012	

