Project Bernstein

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Outline

- Project overview
- Watermarks
- AD751
- AD751 web-version
- Paper dating application
- Summary

Project overview

Project Berstein

- Bernstein = amber
- OeAW
- co-funded by E.U.
- area of research - history of paper

Project Bernstein (2)

- output
  - digital infrastructure for paper expertise
  - watermarks DB
  - image measurement SW
  - contextual resources for cartography and bibliography
  - integrated workspace

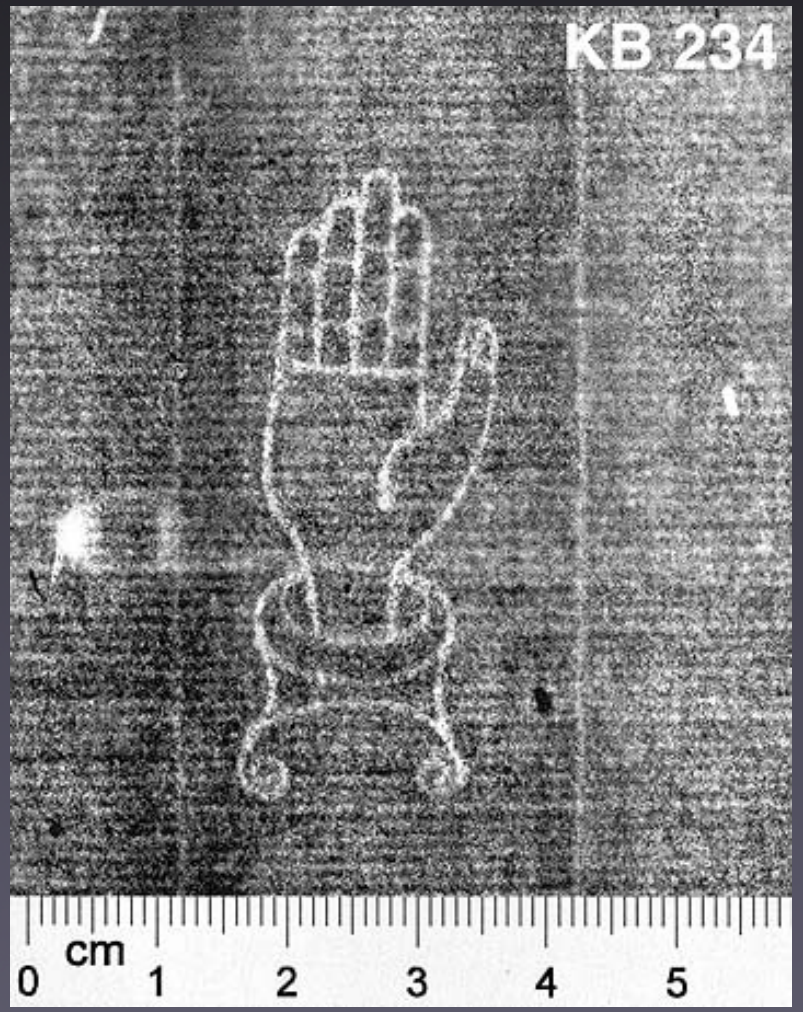
Watermarks

Watermarks overview

- introduced in Italy
- proof of authenticity
- different paper mass width
- produced by bent wire
- limited mould lifespan (~4 years)

Watermarks

- laid lines
- watermark symbol



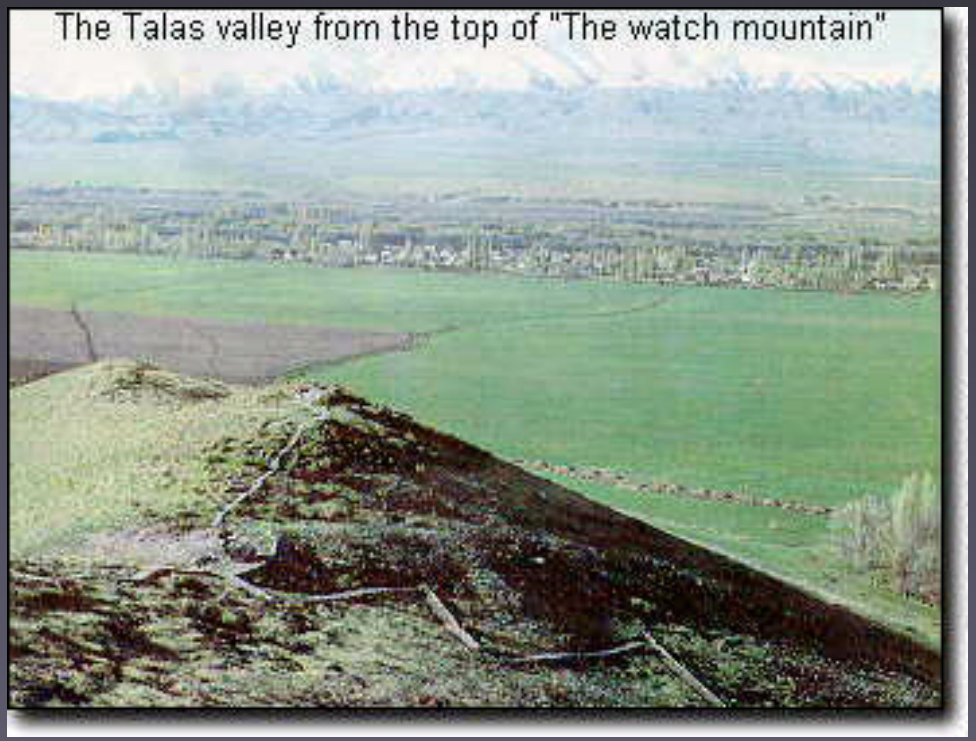
Watermarks DB

- different wat. DBs
- produced by manual expertise
- dates for known watermarks

AD751

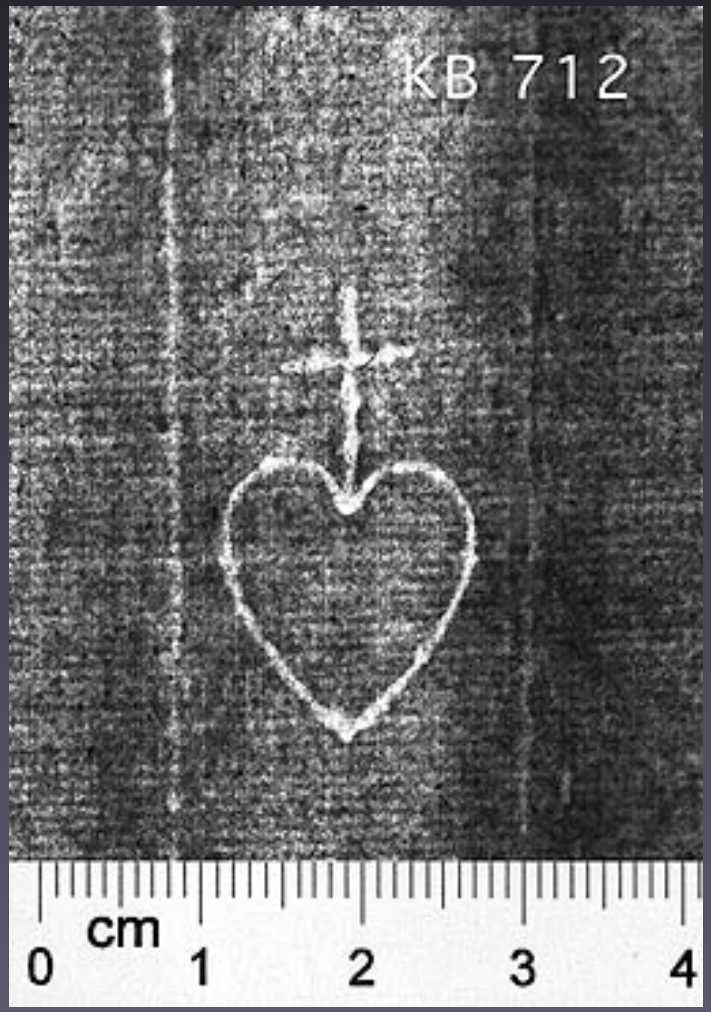
AD751 overview

- tool for laid lines measurements
- author: Vlad Radu Atanasiu
- Matlab based
- GUI app.
- Talas Valey



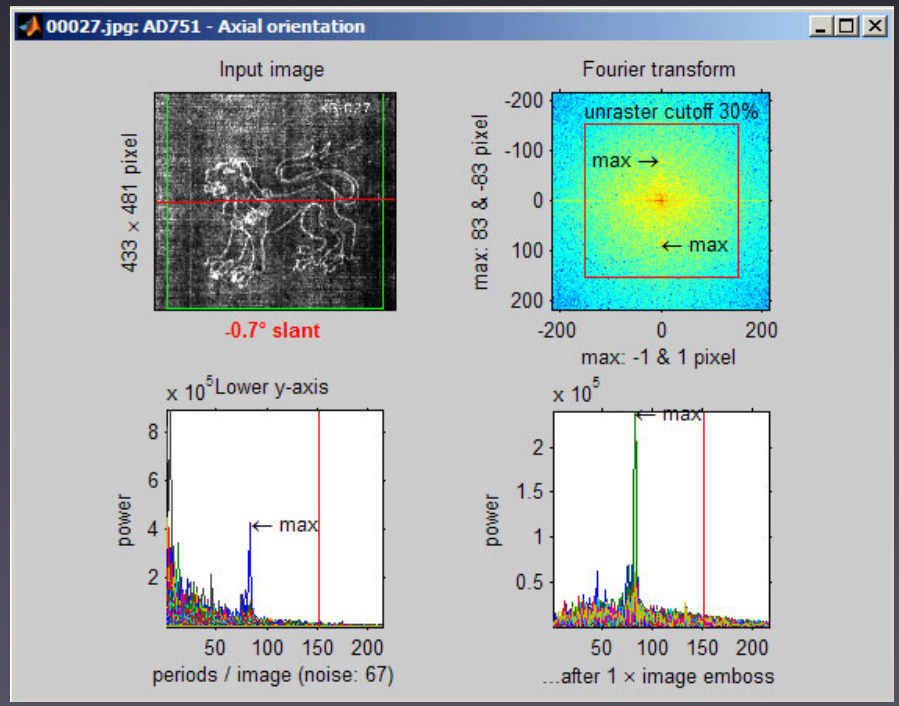
Laid lines

- paper mould
  - wooden form
  - screen of wires/ threads/stems
- paper mass differencies
- line - 'watermarks'

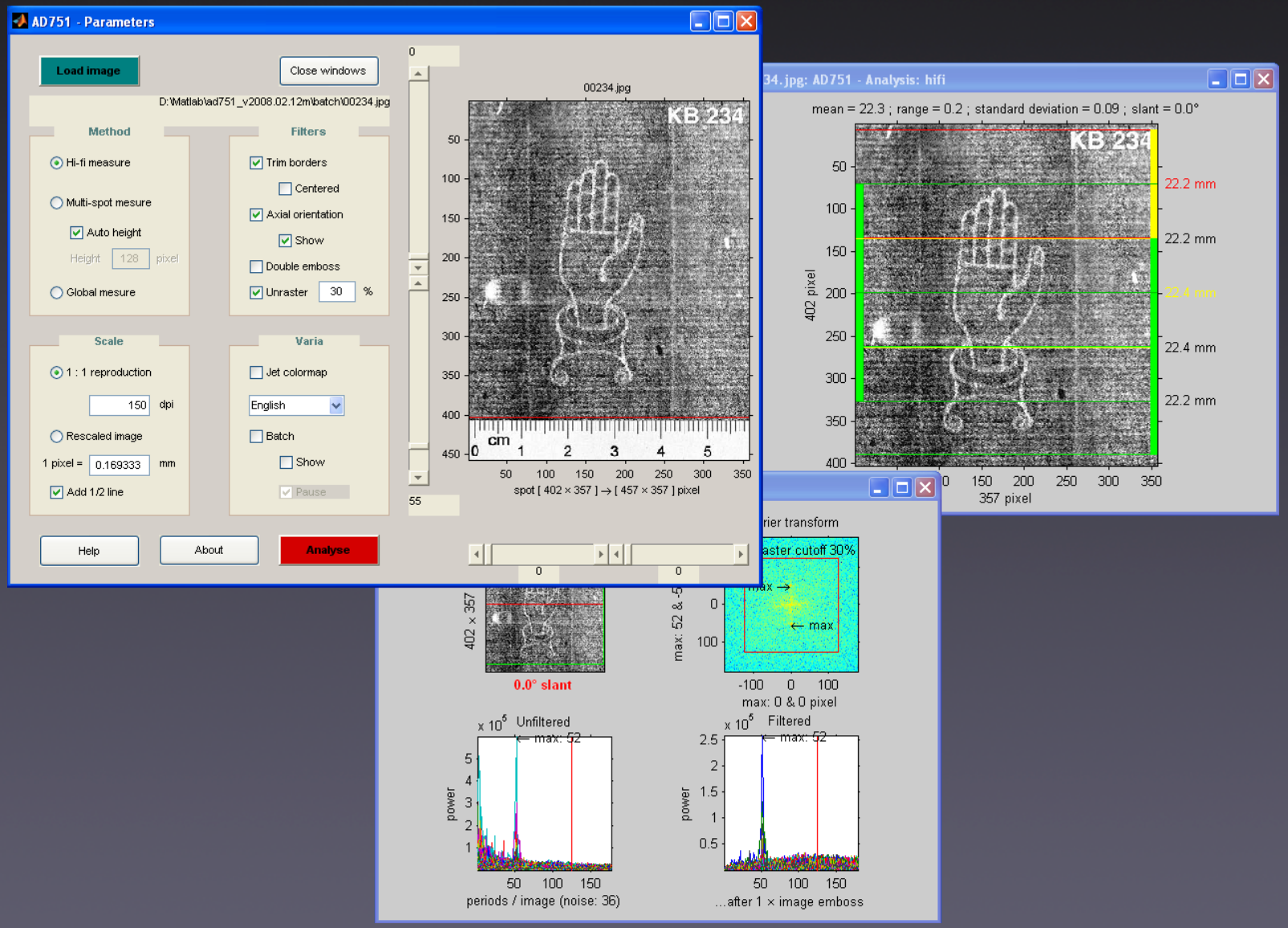


Functionality

- 3 different analysis methods
- orientation
- batch processing



AD751 GUI


AD751 - Parameters
Load image
Close windows
D:\Matlab\ad751_v2008.02.12m\batch\00234.jpg
Method
Hi-fi measure
Multi-spot mesure
Auto height
Height 128 pixel
Global mesure
Filters
Trim borders
Centered
Axial orientation
Show
Double emboss
Unraster 30 %
Scale
1 : 1 reproduction
150 dpi
Rescaled image
1 pixel = 0.169333 mm
Add 1/2 line
Varia
Jet colormap
English
Batch
Show
Pause
Help
About
Analyse
00234.jpg
KB 234
spot [402 × 357] → [457 × 357] pixel
34.jpg: AD751 - Analysis: hifi
mean = 22.3 ; range = 0.2 ; standard deviation = 0.09 ; slant = 0.0°
22.2 mm
22.2 mm
22.4 mm
22.2 mm
402 pixel
357 pixel
0.0° slant
max: 0 & 0 pixel
Unfiltered
Filtered
power
periods / image (noise: 36)
...after 1 × image emboss

AD751 web-version

Matlab to web

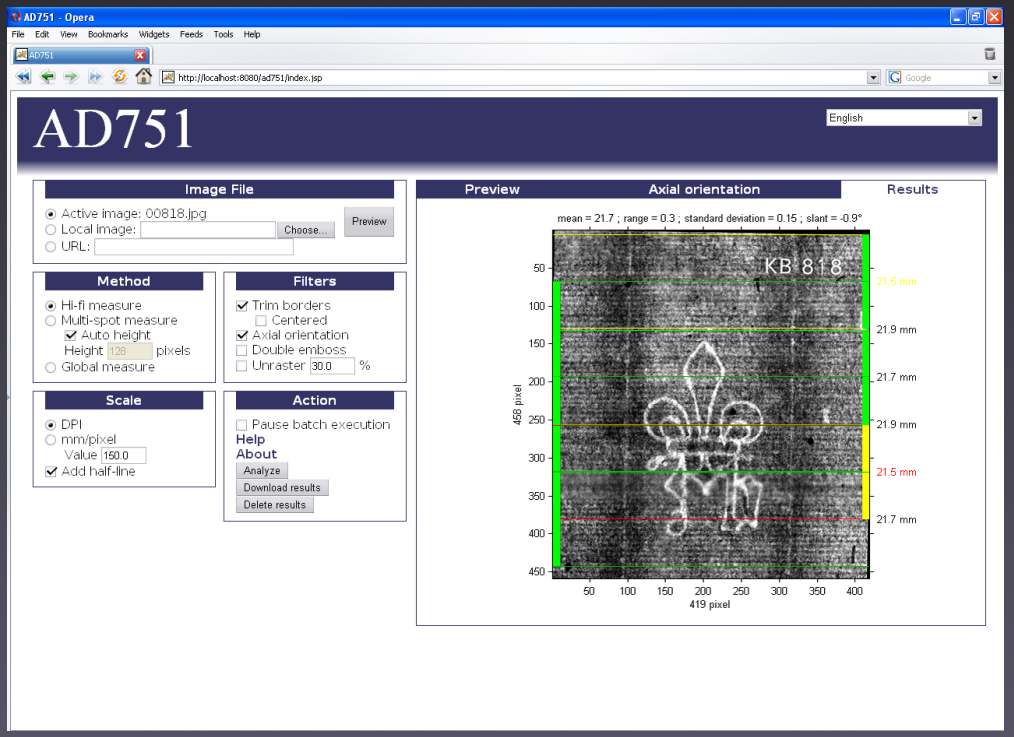
- Matlab Builder JA/NE
  - compiling matlab code to Java/.NET
  - no GUIDE GUIs
  - variable number of parameters/results
- Webfigure applet
  - rotation, zoom, move

Matlab to web

- Java
  - use mcc to compile .m files
  - instantiate produced Java class
  - call approptiate methods
  - (display Webfigures)
  - release allocated (Matlab) resources
- JSP, HttpServlet

AD751 web

- full AD751 functionality
- HTML4, JS, CSS2
- Opera, FF, IE7



Paper dating application

Dating overview

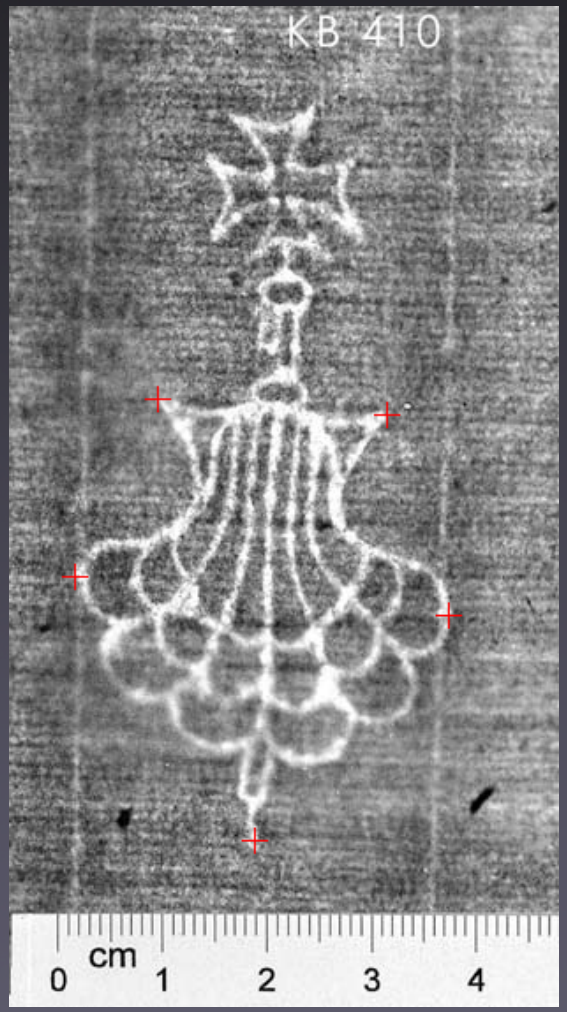
- limited mould lifespan
  - watermark bound to couple of years
  - differencies between various generations of the same watermark
- dated documents used for dating non-dated ones
- watermark comparison methods

Dating app. overview

- demonstrator application
- web based
- limited DB
- available to public

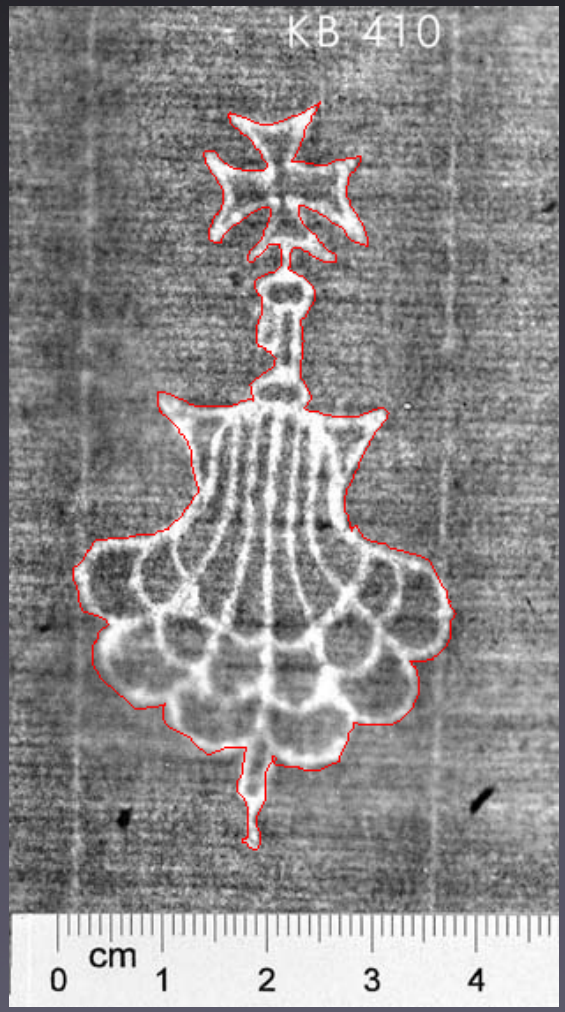
Comparison methods

- Landmarks
  - extremal points
  - class specific
  - PCA



Comparison methods (2)

- Wire length
  - imune to shape deformations



Cross-dating

- multiple watermarks (books)
- intersection of potential intervals
- enhancement of precision (?)

Process

- select watermark
- select method
- enter landmarks/wire length
- ... processing ...
- view results
- (add another watermark)

Summary

Summary

- watermarks
- paper analysis & dating
- Matlab to web

Thank you for your attention