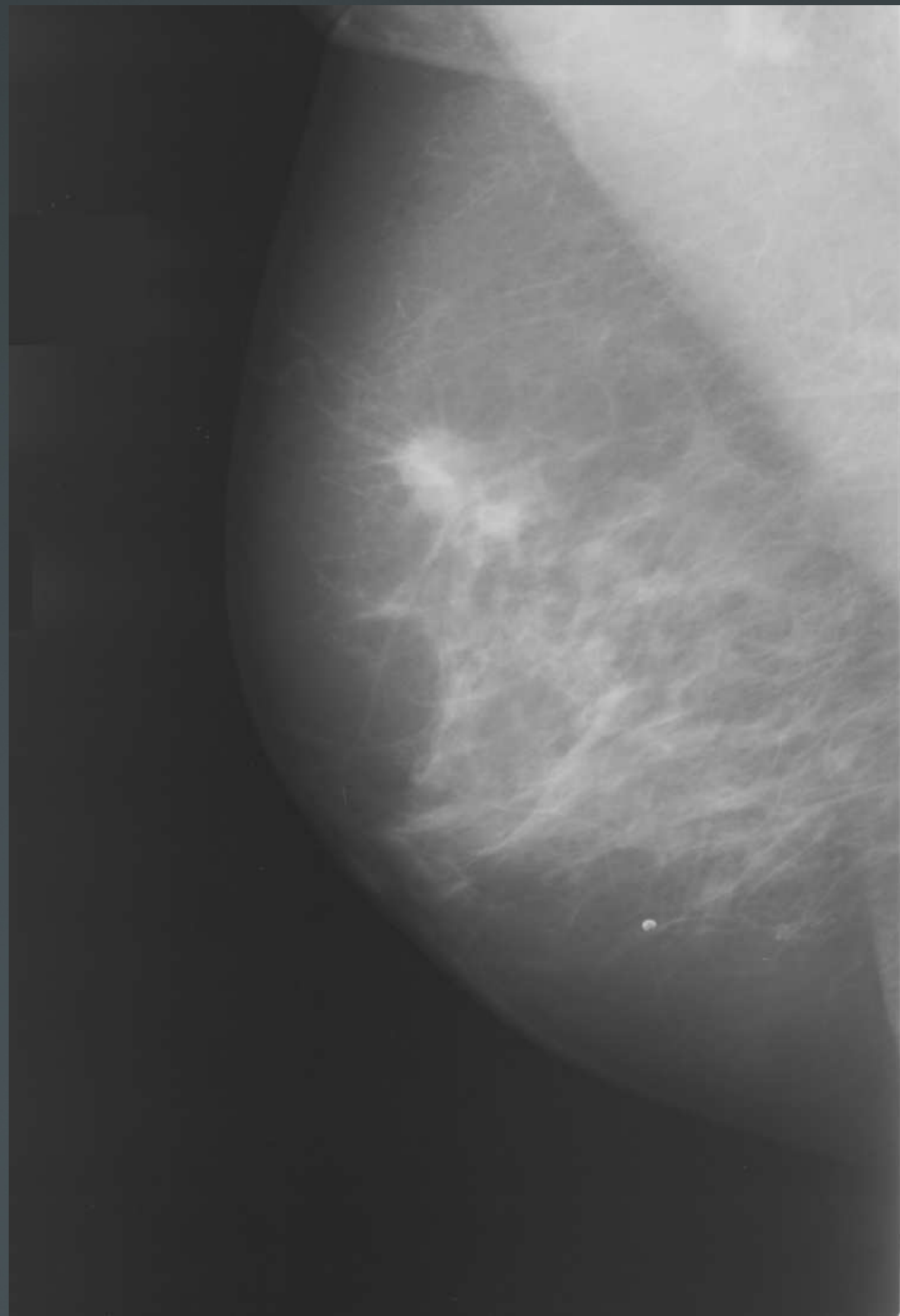
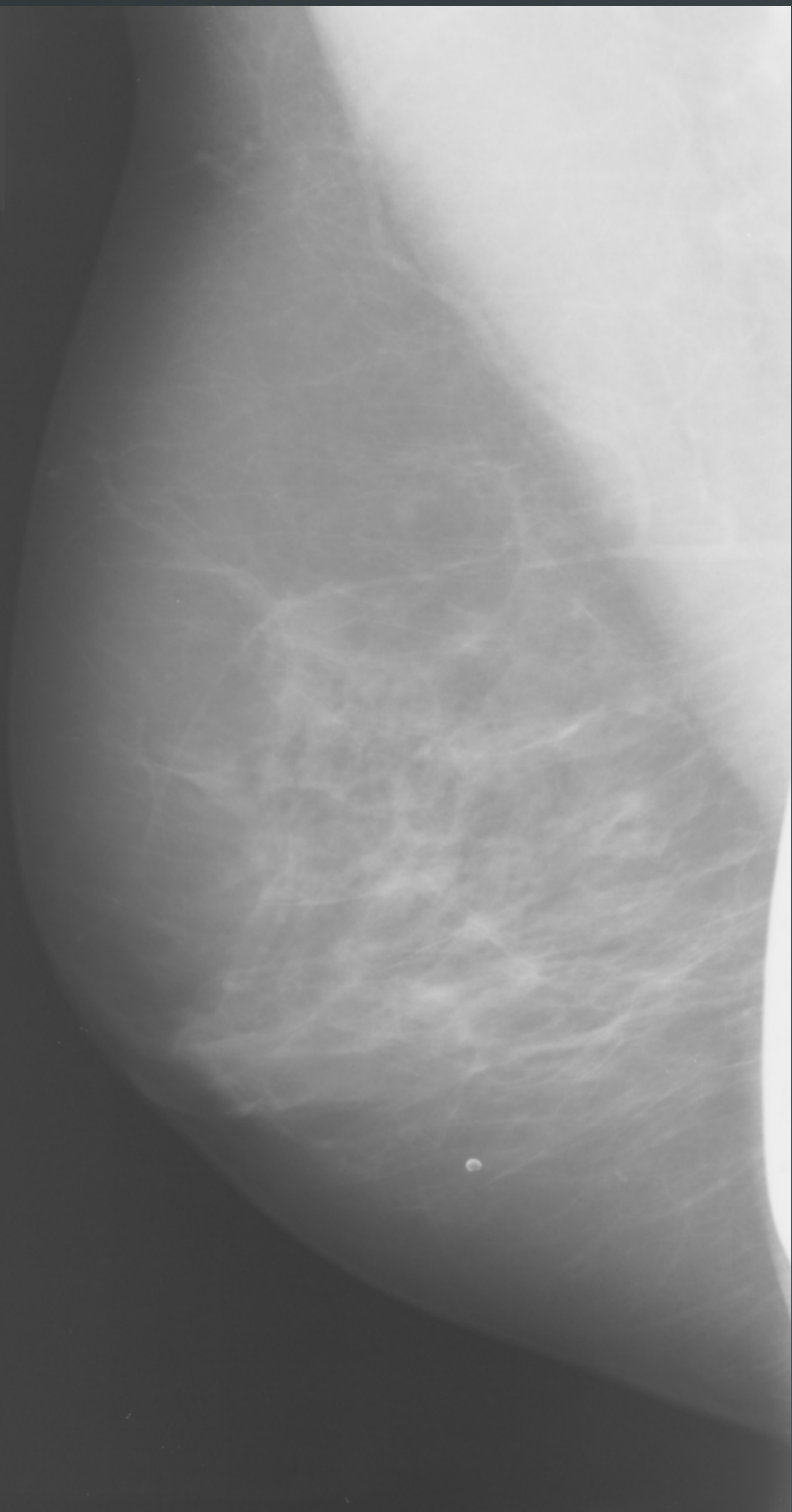
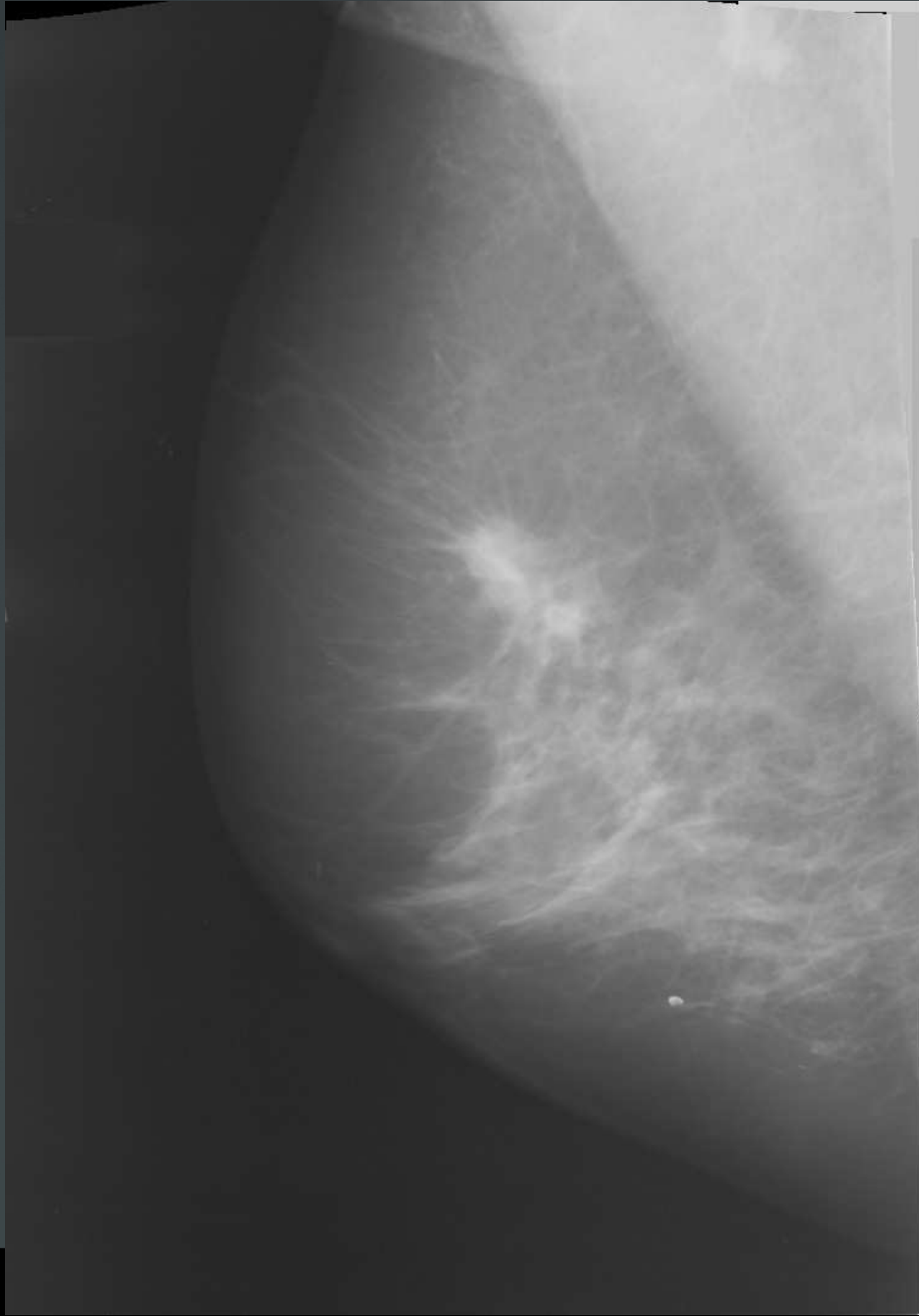


ITK REGISTRATION







SUMMARY

1- GETTING STARTED

2- WHAT DOES THE CODE DO?

3- FOR / AGAINST

4- APPLICATIONS

5- ...



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itk: <http://itk.org/>

- Download: <http://itk.org/ITK/resources/software.html>
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Where to get help:

- itk mailing list: <http://itk.org/ITK/help/ mailing.html>

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2- WHAT DOES THE CODE DO?

C++ / ITK

- Extend some of the registration examples in itk programming guide.
 - Unified format.
 - Combination of examples
 - Correction of some errors



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 - AFFINE
 - BSPLINES (Flexible)
 - DEMONS
 - POLIRIGID



2- WHAT DOES THE CODE DO?

C++ / ITK

- Extend some of the registration examples in itk programming guide.
 - Unified format.
 - Combination of examples
 - Correction of some errors
- Registration methods:
 - RIGID
 - AFFINE
 - BSPLINES (Flexible)
 - DEMONS
 - POLIRIGID
- Advanced “methods”
 - Multiresolution
 - MR Affine
 - MR Bsplines
 - Method combination (via scripts, not C++)
 - Affine + Bsplines
 - MR AFFINE + MR Bsplines



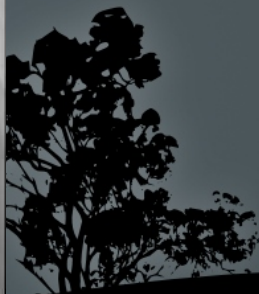
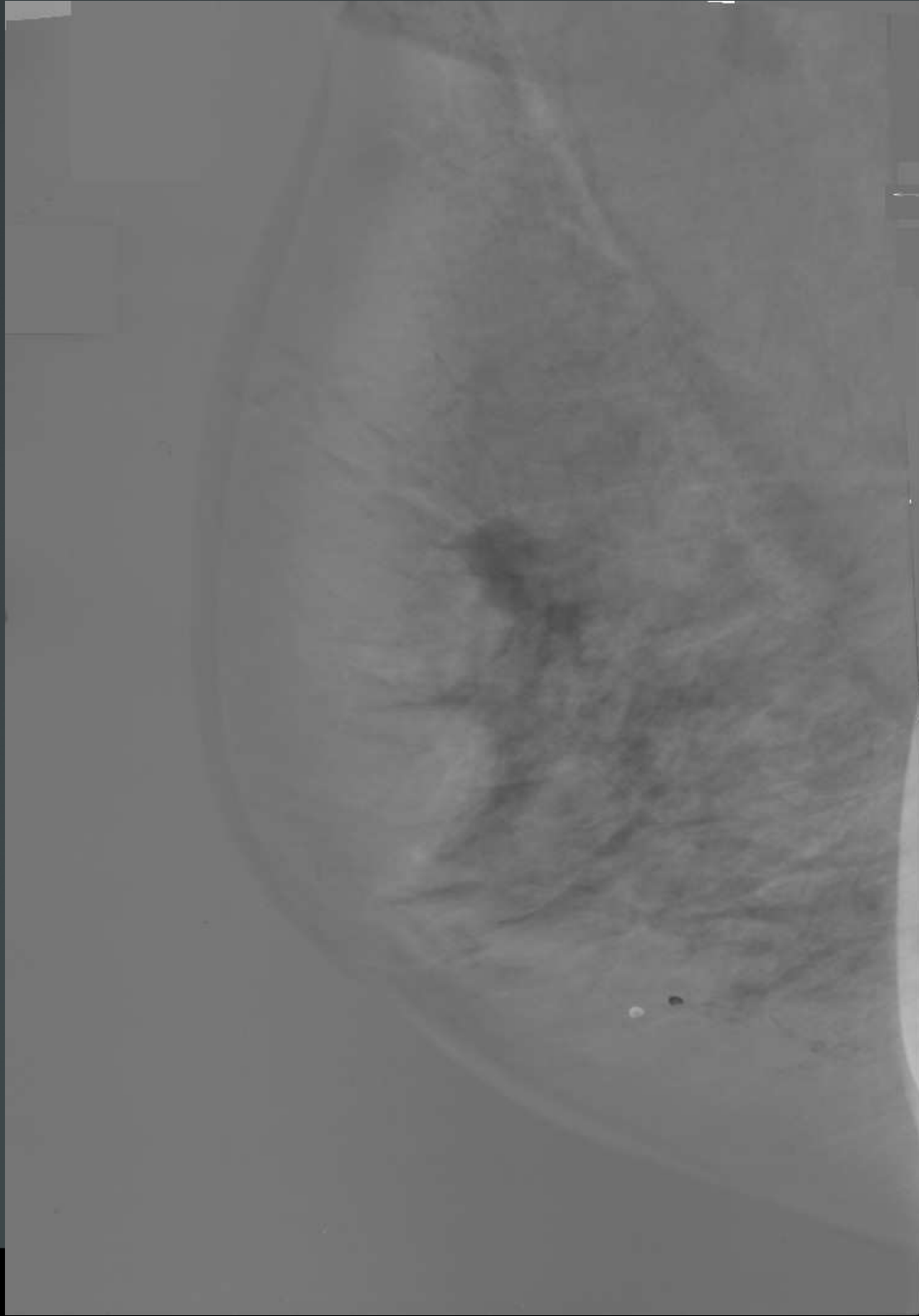
2- WHAT DOES THE CODE DO?

C++ / ITK

Code example (RegistreFlexible.cxx):

- Two possible Distances.
- Registration Structure (Images, parameters, registration Optimizer, Observer)
- Output
 - Output image
 - Difference images
 - Checkerboard images
 - ...





2- WHAT DOES THE CODE DO?

Bash shell scripts

- Test bash scripts:
 - Call Registration Methods.
 - “Black-Box-wise”
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exemple d'execució:

```
./testadorAfi ~/principal/codi/c++/mamo/arpons/MOCKUPF027140/7.dcm ~/principal/codi/c++/mamo/arpons/MOCKUPF027140/8.dcm ./ 100
```

#definim parametres:

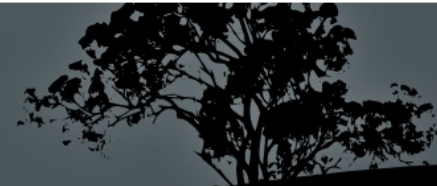
fixed=\$1

moving=\$2

outputDir=\$3

iterations=\$4

numberOfMetrics=2



2- WHAT DOES THE CODE DO?

Bash shell scripts

- Test bash scripts:
 - Call Registration Methods.
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```
for(( i=0 ; i<numberOfMetrics ;i=i+1 ))
do
  echo " "
  echo " ***** "
  echo "          PROVANT metrica de tipus: $i "
  echo " ./registreAfi $fixed $moving ./sortidaAfi$i.dcm $i $iterations > sortidaAfi$i.txt "
  echo " ***** "

  ./registreAfi $fixed $moving ./sortidaAfi$i.dcm $i $iterations > sortidaAfi$i.txt
  mkdir arxiusAfi\_outputDir\_ $i
  mv *.dcm arxiusAfi\_outputDir\_ $i
  mv sortidaAfi$i.txt arxiusAfi\_outputDir\_ $i
done
```

2- WHAT DOES THE CODE DO?

Bash shell scripts

- Test bash scripts:
 - Call Registration Methods.
 - “Black-Box-wise”
 - Allows for (limited) parameter combination
- Traverse sub-directory structure (specific one!)
 - Execute test bash scripts
 - Organize information (sort results for different methods randomly)
 - Delete intermediate files.



2- WHAT DOES THE CODE DO?

Bash shell scripts

- Test bash scripts:
 - Call Registration Methods.
 - “Black-Box-wise”
 - Allows for (limited) parameter combination
- Traverse sub-directory structure (specific one!)
 - Execute test bash scripts
 - Organize information (sort results for different methods randomly)
 - Delete intermediate files.
- Modify Dicom Tags (uses dcmtool, dcmtool)
- Create DicomDirs (uses dcmtool, dcmtool)
- Send “progres” e-mail (need exim4)
- ...



SUMMARY

1- GETTING STARTED

2- WHAT DOES THE CODE DO?

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3- FOR / AGAINST

- Easy to use (I hope)
- Many methods, general purpose problem
- Possibility to extend / touch anything
- Accepts many image formats
- It actually works!
- Some working experience
- Possibility to incorporate more methods.



3- FOR / AGAINST

- Easy to use (I hope)
 - Many methods, general purpose problem
 - Possibility to extend / touch anything
 - Accepts many image formats
 - It actually works!
 - Some working experience
 - Possibility to incorporate more methods.
- Function names and notation!
 - Not the best programming ever (by far)
 - ← Not easy!
 - ← (not ALL? Sik?)
 - ← ... most of the time!



SUMMARY

1- GETTING STARTED

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4- APPLICATIONS (SO FAR)

- MAMMOGRAPHIC REGISTRATION (some written results and conclusions).

-



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5- . . .

- Free support!
- Contact: yago@eia.udg.edu
- Future Work
- Questions?

