

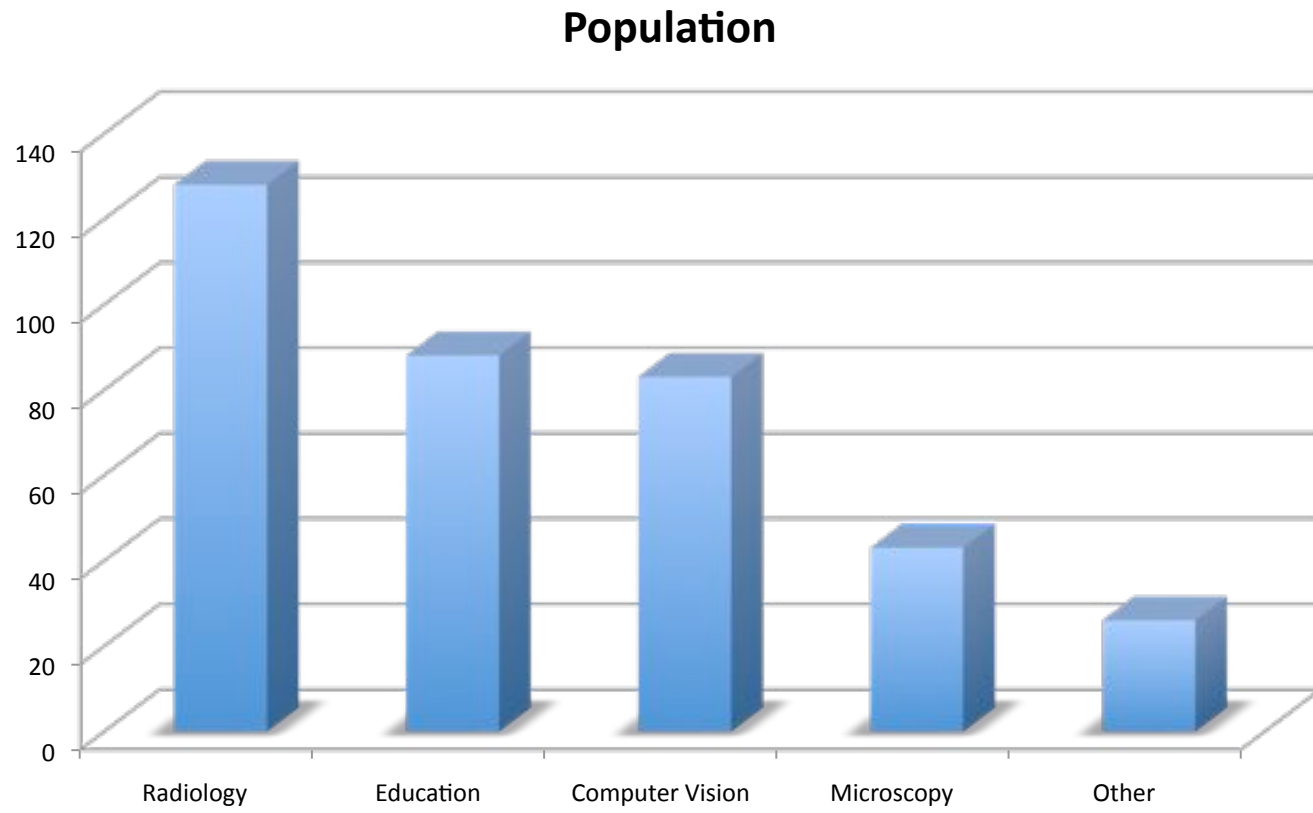
SimpleITK Survey: Preliminary Results

General Statistics

- 214* participants
- Non-ITK users:
 - 13.55% (29 participants) have never used ITK
 - 185 have used ITK
 - 55% (16) of non-ITK users are C++ users
- Non-C++ users:
 - 15.88% (34 participants) have never used or don't feel comfortable using C++
 - Specific distribution: 4 + 30
 - 61% (21) of non-C++ users have used ITK
 - 13 have never used ITK

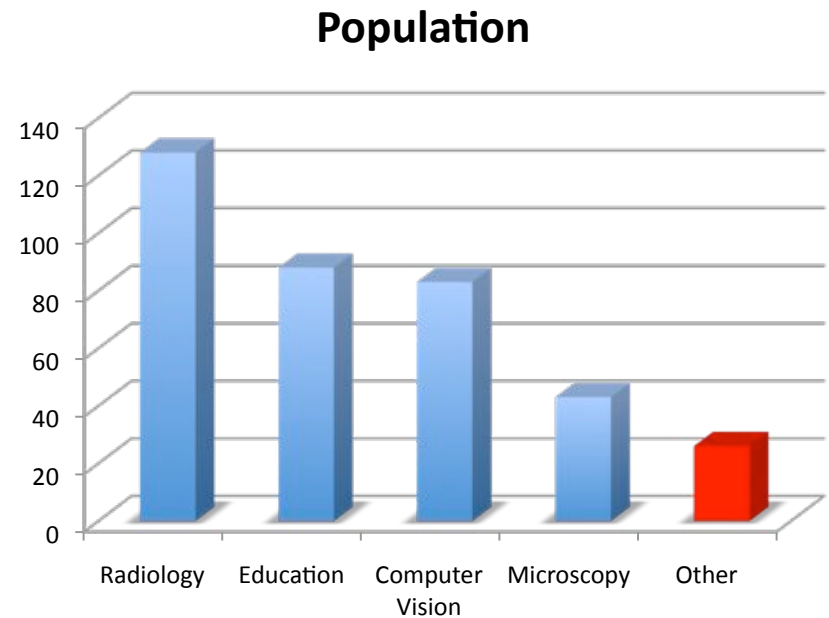
*as of 10/29/10

Population



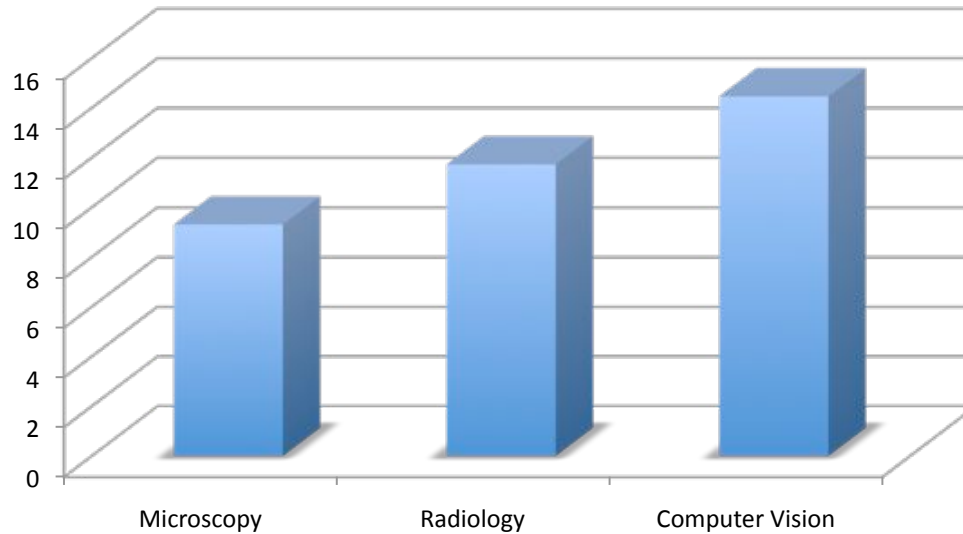
Population: Other

- Neuroimaging
- Ophthalmology
- Remote Sensing
- Statistics
- Microstructure modeling
- fMRI, DWI
- Historical paintings & preservation
- etc...

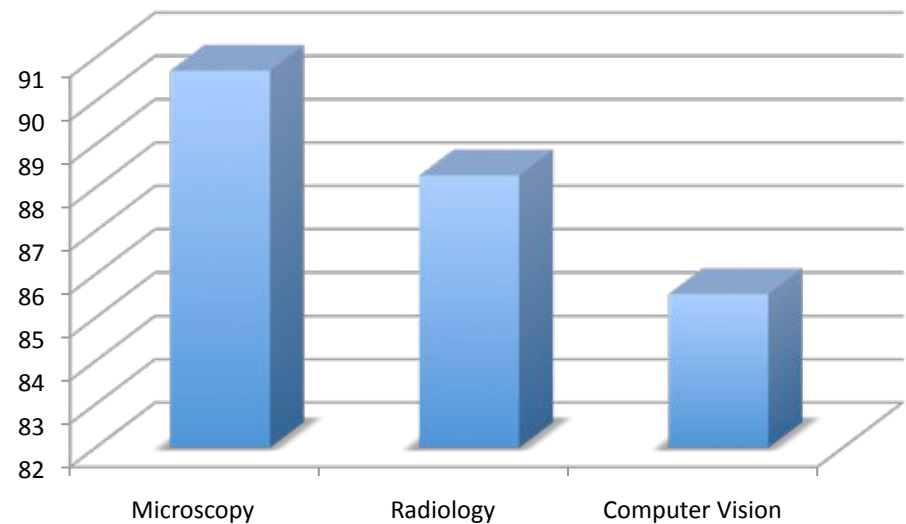


Population that don't use C++

Percentage of Subjects that don't use C++



Percentage of Subjects expert in C++

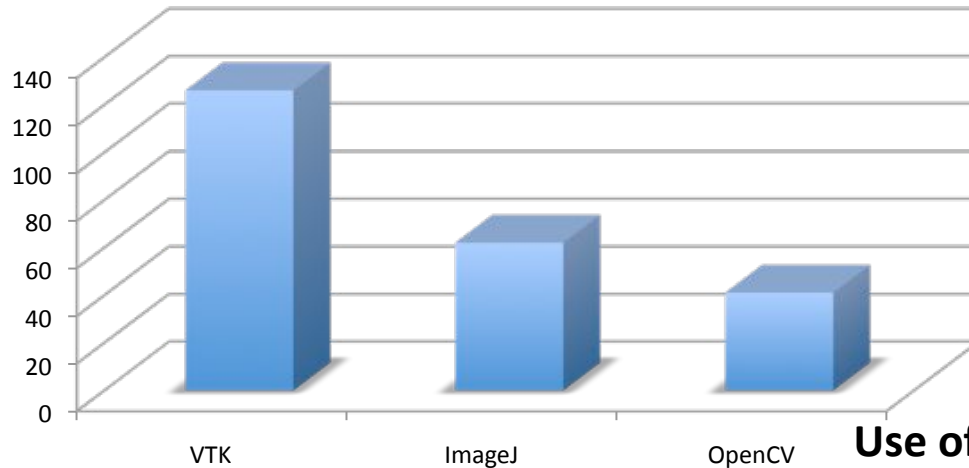


Questions:

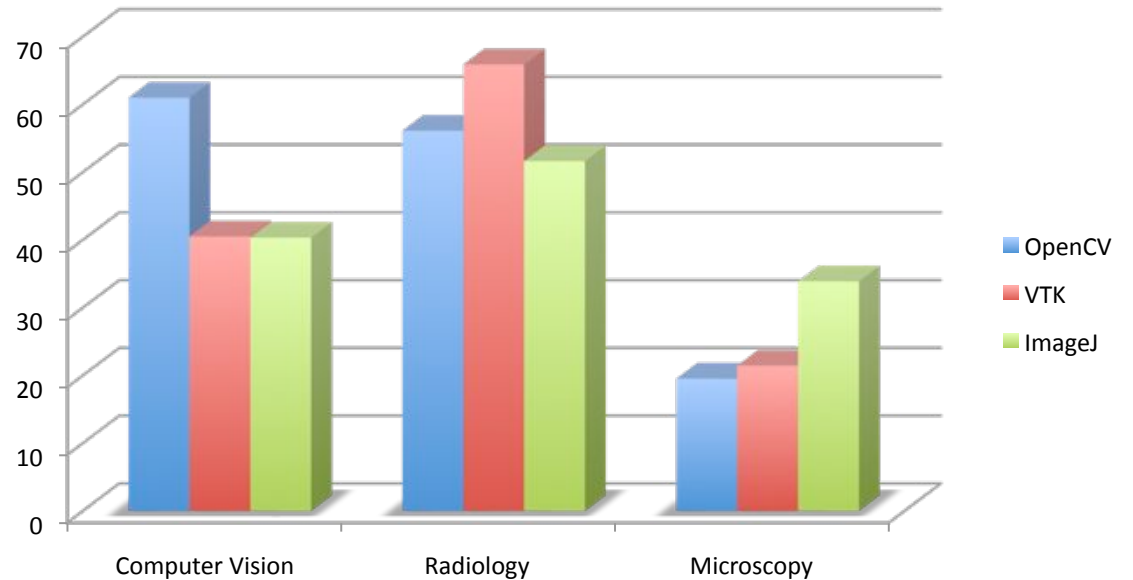
- Most people in microscopy use C++?
- More people in Radiology use C++ than in Computer Vision?

What libraries are used to process images (besides ITK)?

General Use of Three Open Source Libraries



Use of three Imaging Libraries: Different Background

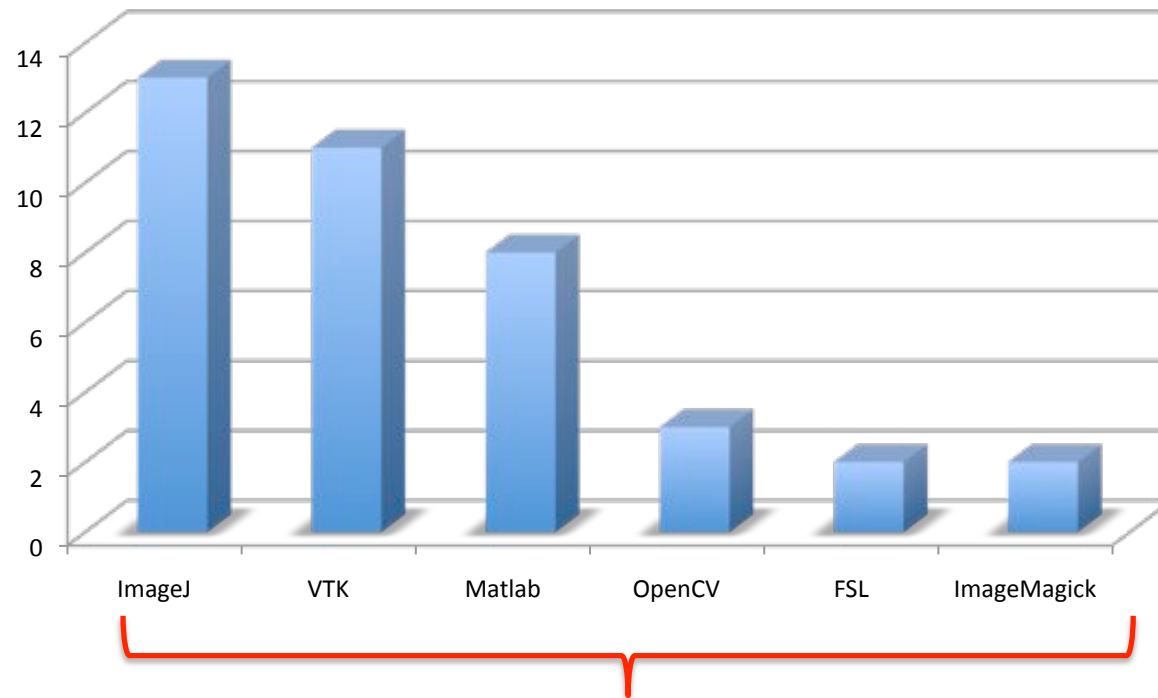


Q:

- Is ImageJ the primary software in microscopy?
- Visualization / Image display is key to radiology.

Libraries used among non-C++ developers

Among Non-C++ Developers



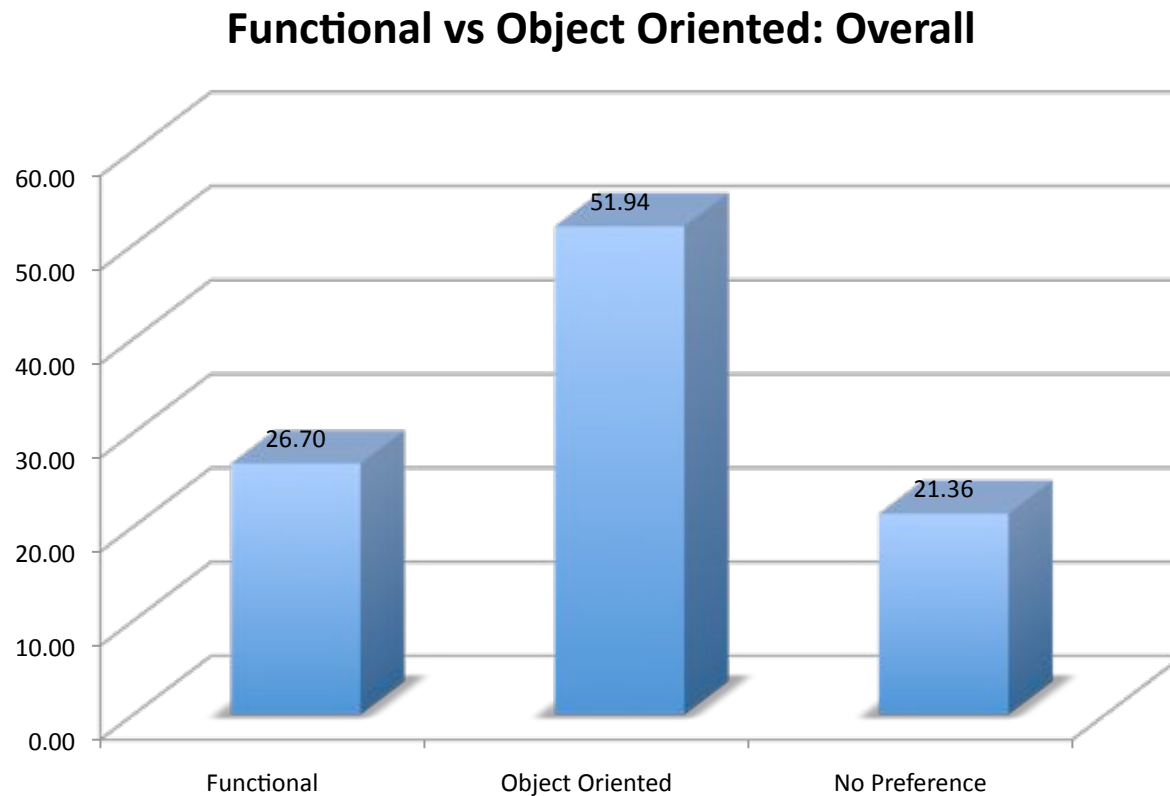
Note that all of the top libraries / applications among non-C++ developers provide processing and visualization.

What other software / libraries?

1. 3D Slicer
2. Analyze
3. Cimage
4. convert3D
5. MIPAV
6. DCMTK
7. ENVI
8. Orfeo Toolbox
9. FSL
10. Camino
11. ITK-snap
12. GDCM
13. Gimp
14. Fiji
15. Irfanview
16. Vxl
17. Matlab
18. Octave
19. Qt
20. OsiriX
21. Simpleware ScanIP
22. Mathematica
23. GPU shaders
24. Mia.sf.net
25. Mipav
26. Etdips
27. Mitk
28. ~~My own code~~
29. Hugin
30. IDL
31. ~~In house Tools~~
32. OpenSceneGraph
33. OTB
34. ParaView
35. PIL
36. Mayavi
37. R
38. Seg3D
39. V3D
40. VisualC++
41. ANTS
42. Numpy
43. Scipy
44. ImageMagick

ITK

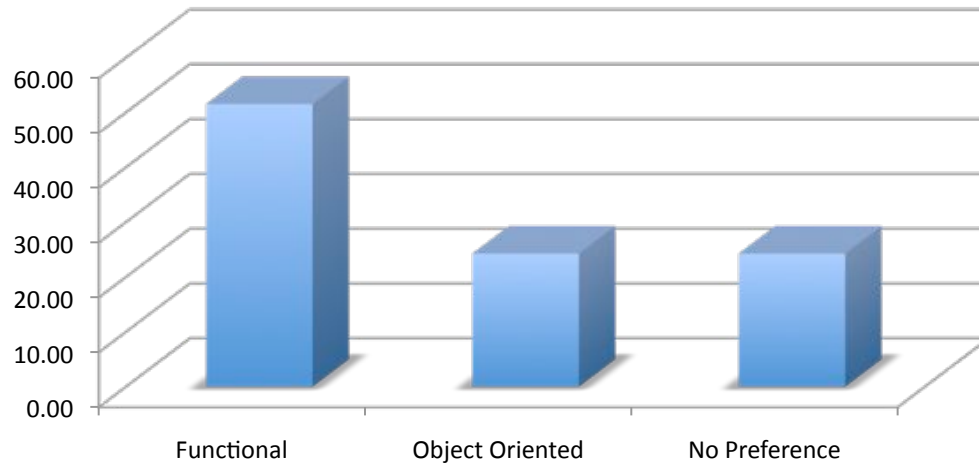
Functional vs. Object Oriented



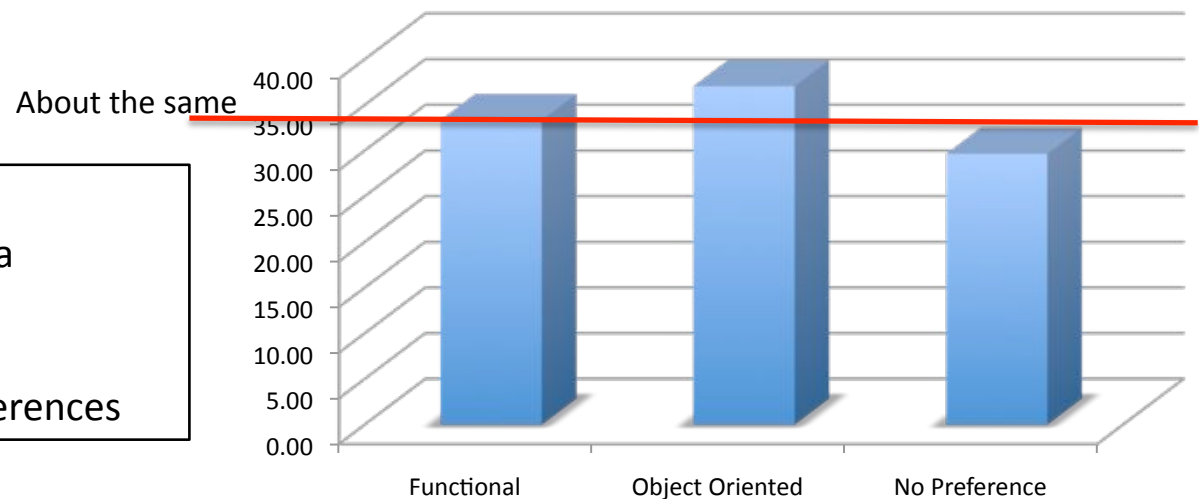
Overall, it seems that people prefer an *Object Oriented* programming style. However....

Functional vs. Object Oriented

Preference Among Non-C++ Programmers



Preference Among Non-ITK Users

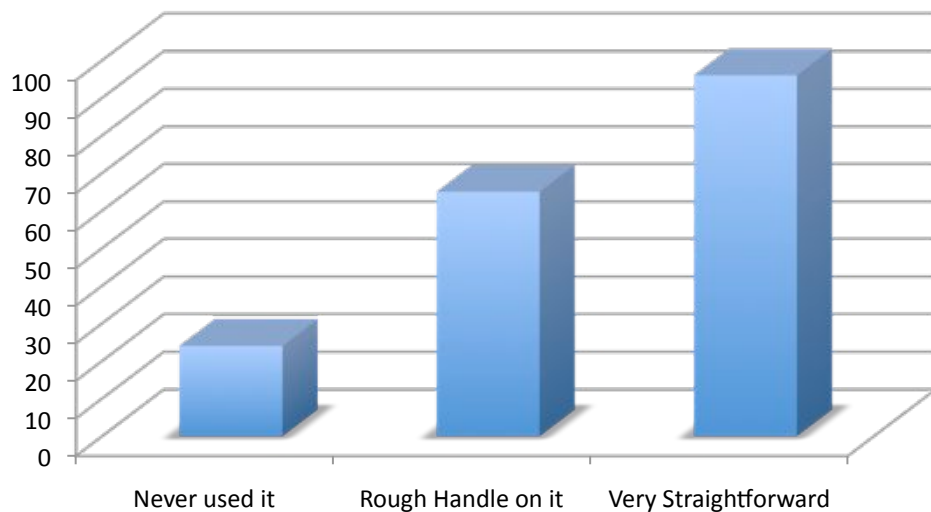


However:

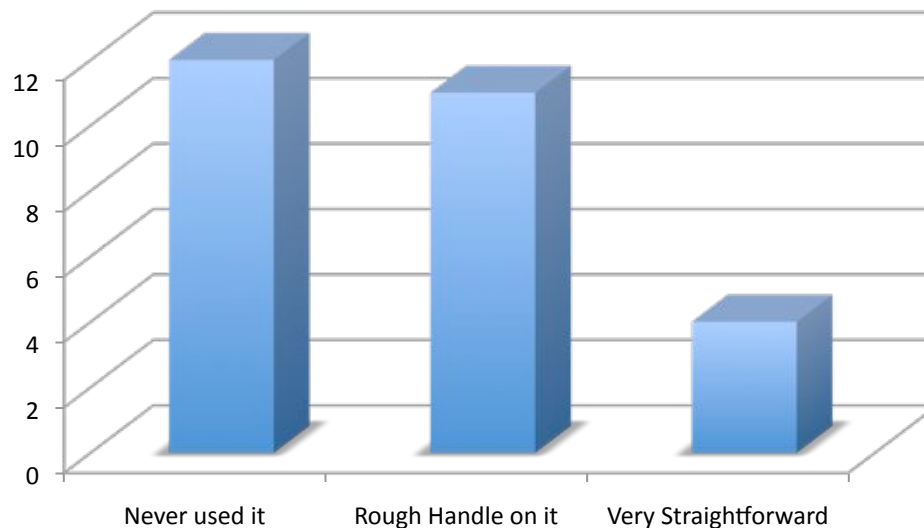
- Non-C++ programmers prefer a Functional style
- Non-ITK users don't have preferences

How well do you understand the pipeline?

Filter Pipeline: Overall



Filter Pipeline: Non-C++ Developers

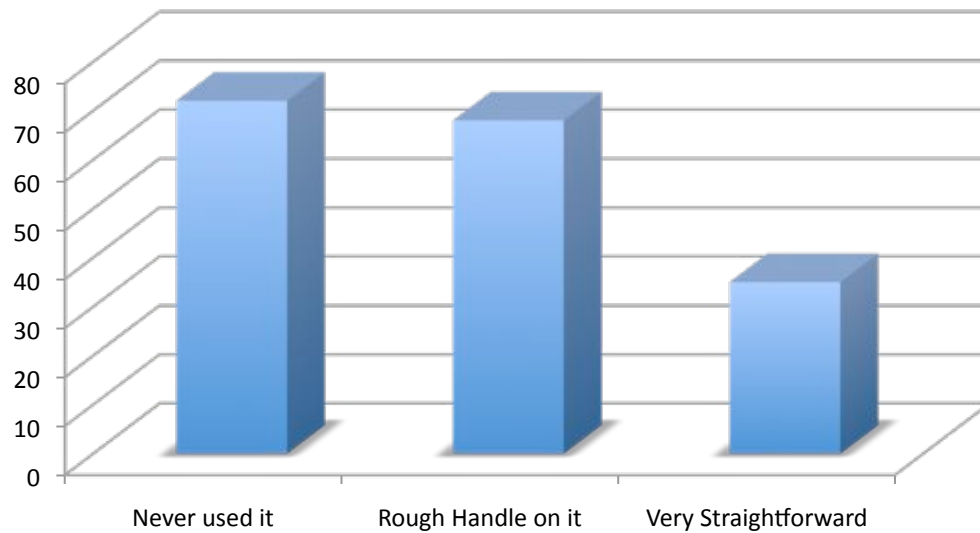


Note:

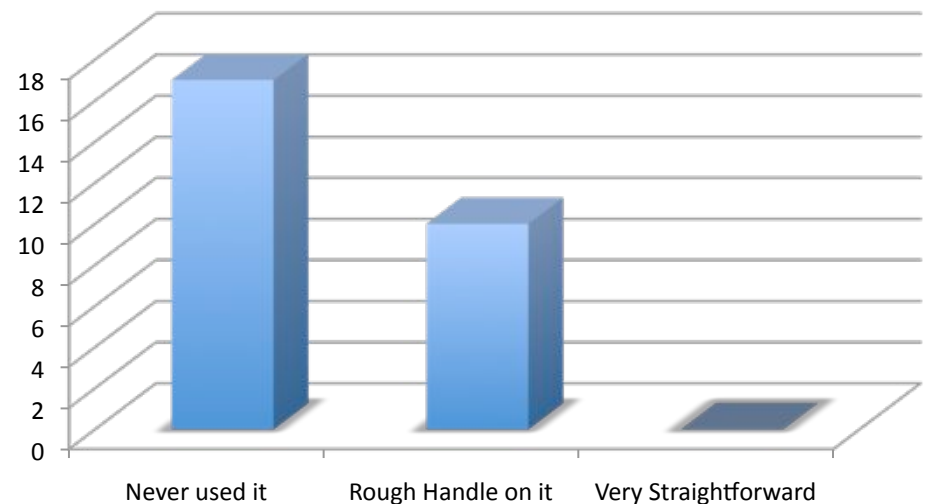
Non-C++ Users (including the 61% that have used ITK), don't understand the pipeline.

How well do you understand streaming?

Streaming: Overall



Streaming: Non-C++ Developers



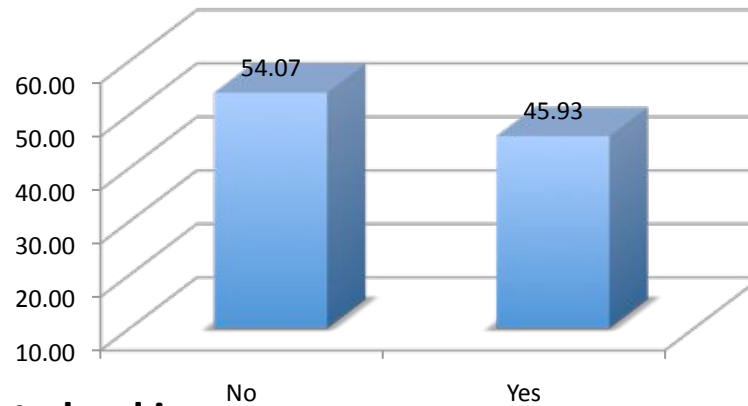
Note:

Most ITK, non-ITK, and C++ users don't have a clear understanding of streaming

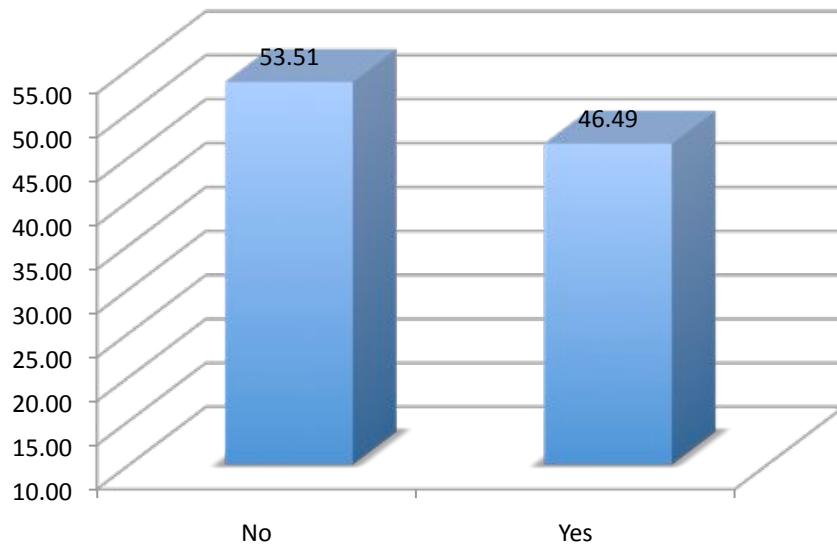
However....

Loading images larger than RAM?

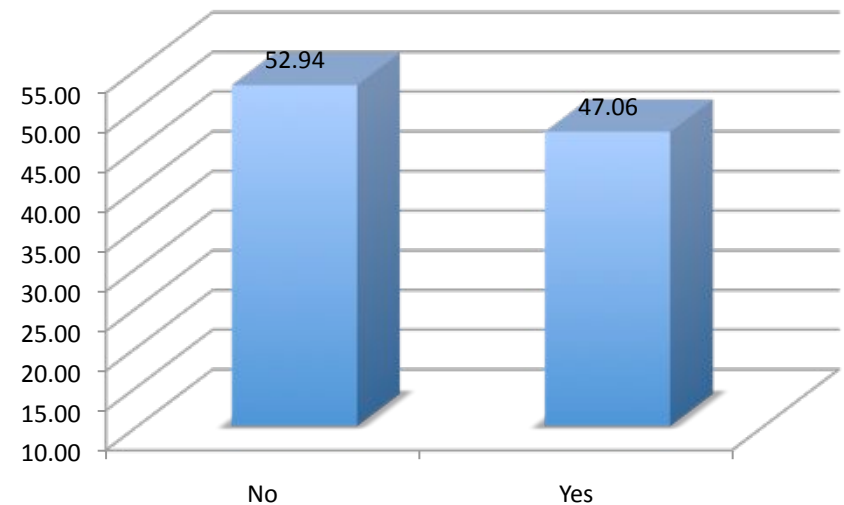
Overall: Do you need to load images larger than local memory?



ITK Users: Do you need to load images larger than local memory?

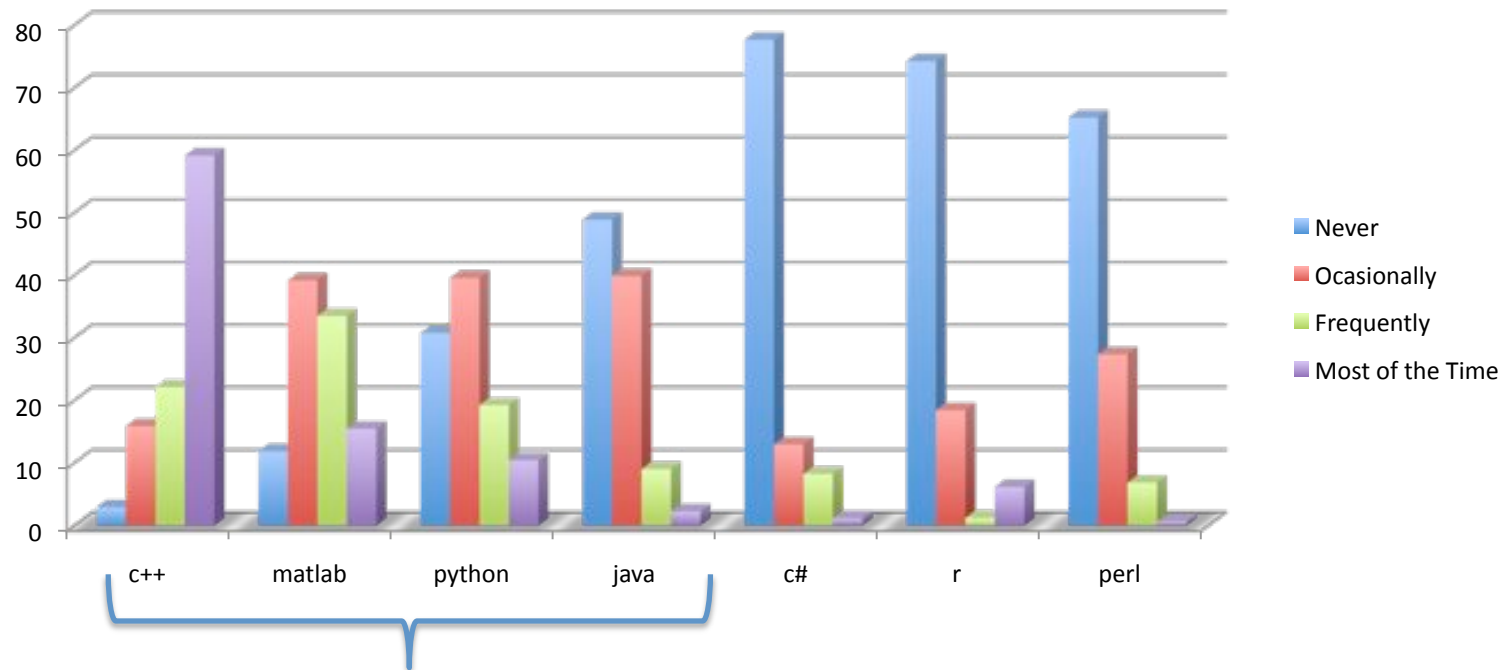


Non-C++ Users: Do you need to load images larger than local memory?



Programming Languages

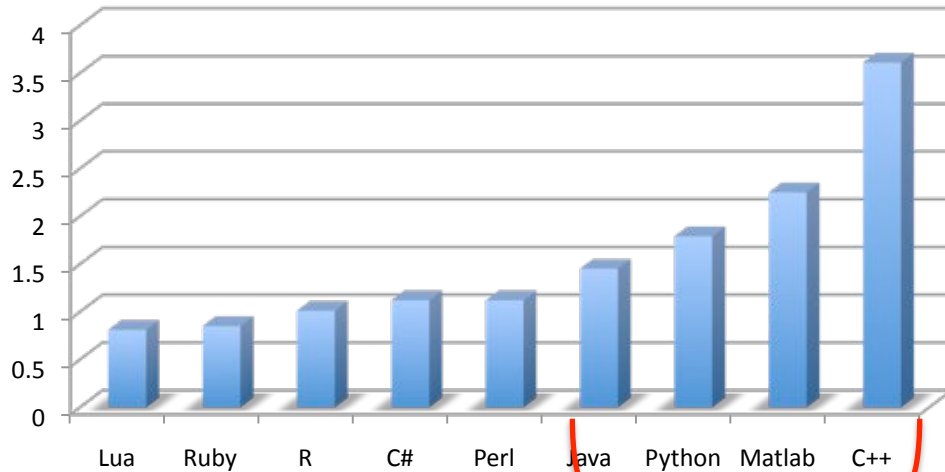
Programming Language: Overall



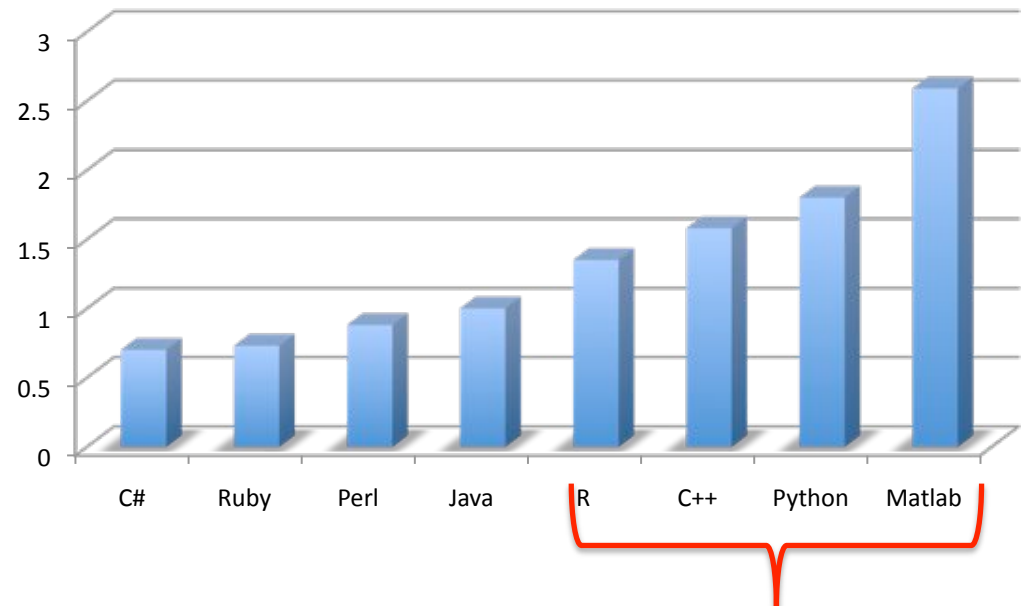
The most important programming languages?

Programming Languages

Preferences: C++ Experts



Preferences: Non C++ Developers



Q:

Can we say that Matlab, Python, C++, Java, and R are the most important programming languages?

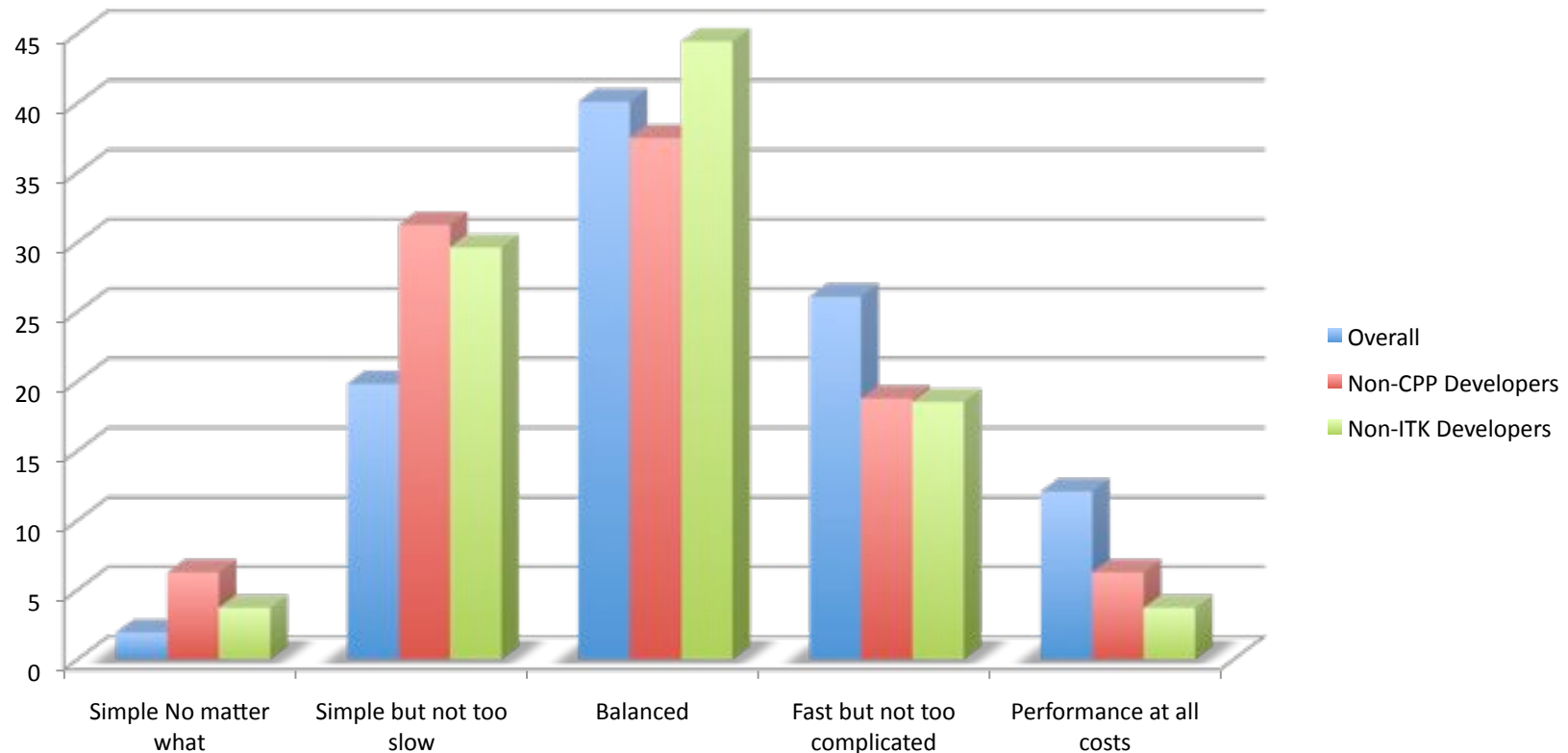
Other programming languages

- Bash
- C
- Fortran
- JavaScript
- Mathematica
- Objective-C
- Octave
- PHP
- D
- Vala
- TCL
- Visual Basic

The logo for C/C++ programming languages, featuring the text 'C/C++' in a stylized, blue, rounded font with a white outline and a slight shadow effect.

Simplicity vs. Performance

Performance Among Groups

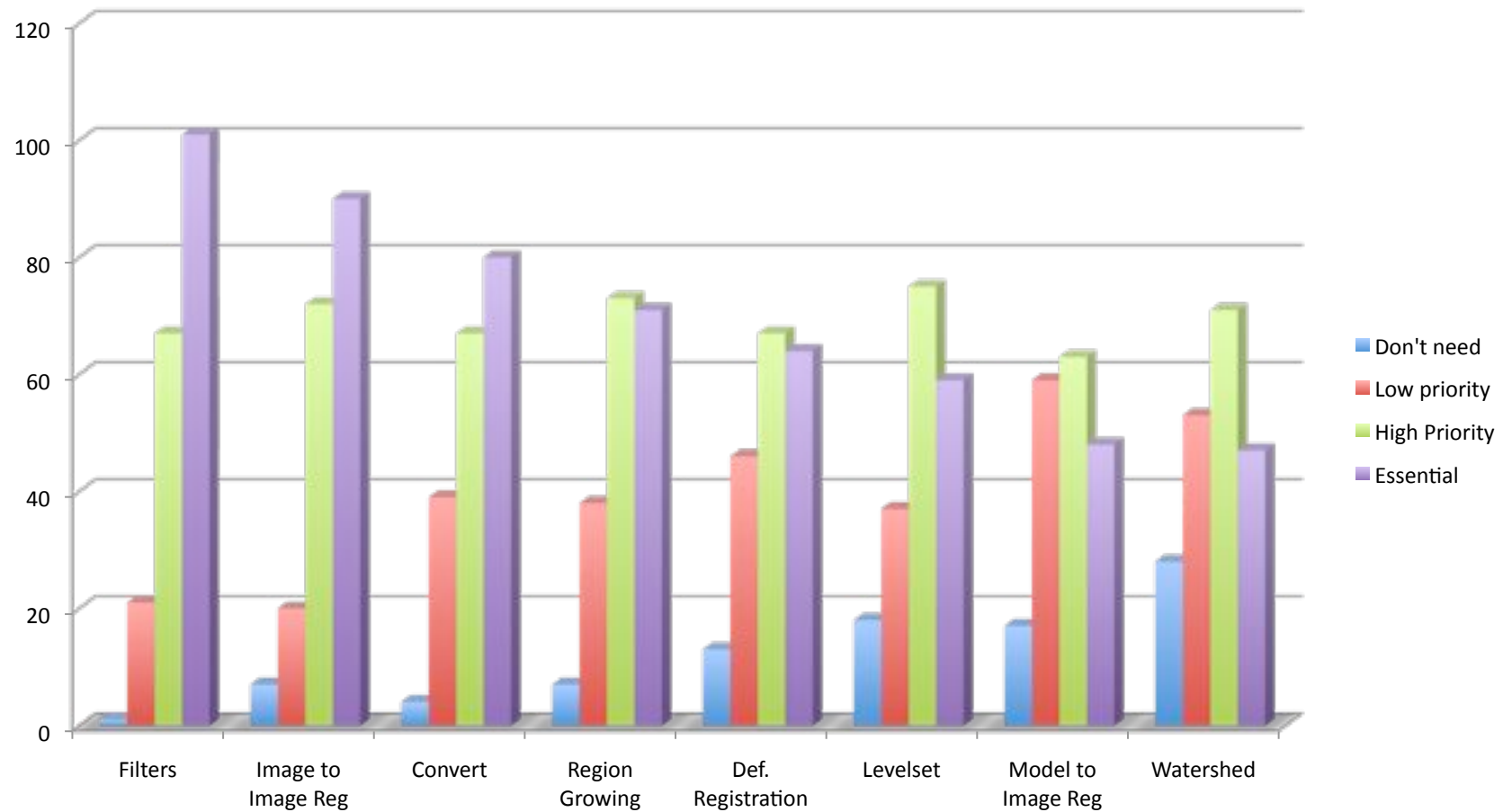


Order: 4 2 1 3 5

It seems that for non-C++ and non-ITK developers simplicity is more important than performance.

What ITK features are important?

Overall Importance

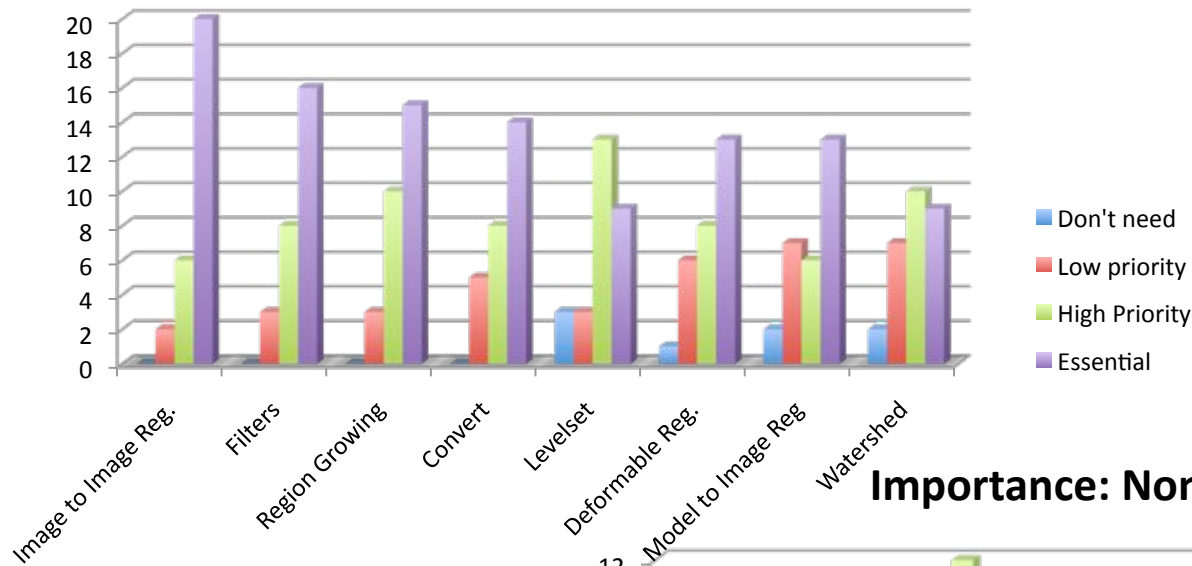


Note:

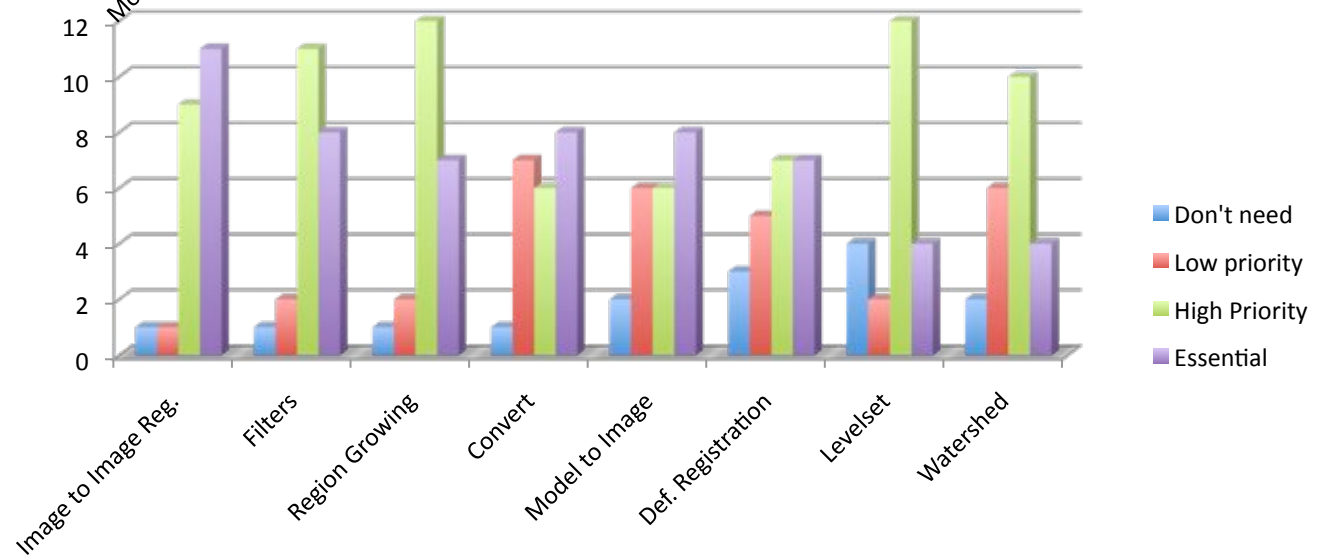
A good and simple segmentation technique is better than a complex and state-of-the-art approach?

What ITK features are important?

Importance: Non C++ Developer



Importance: Non-ITK Developers

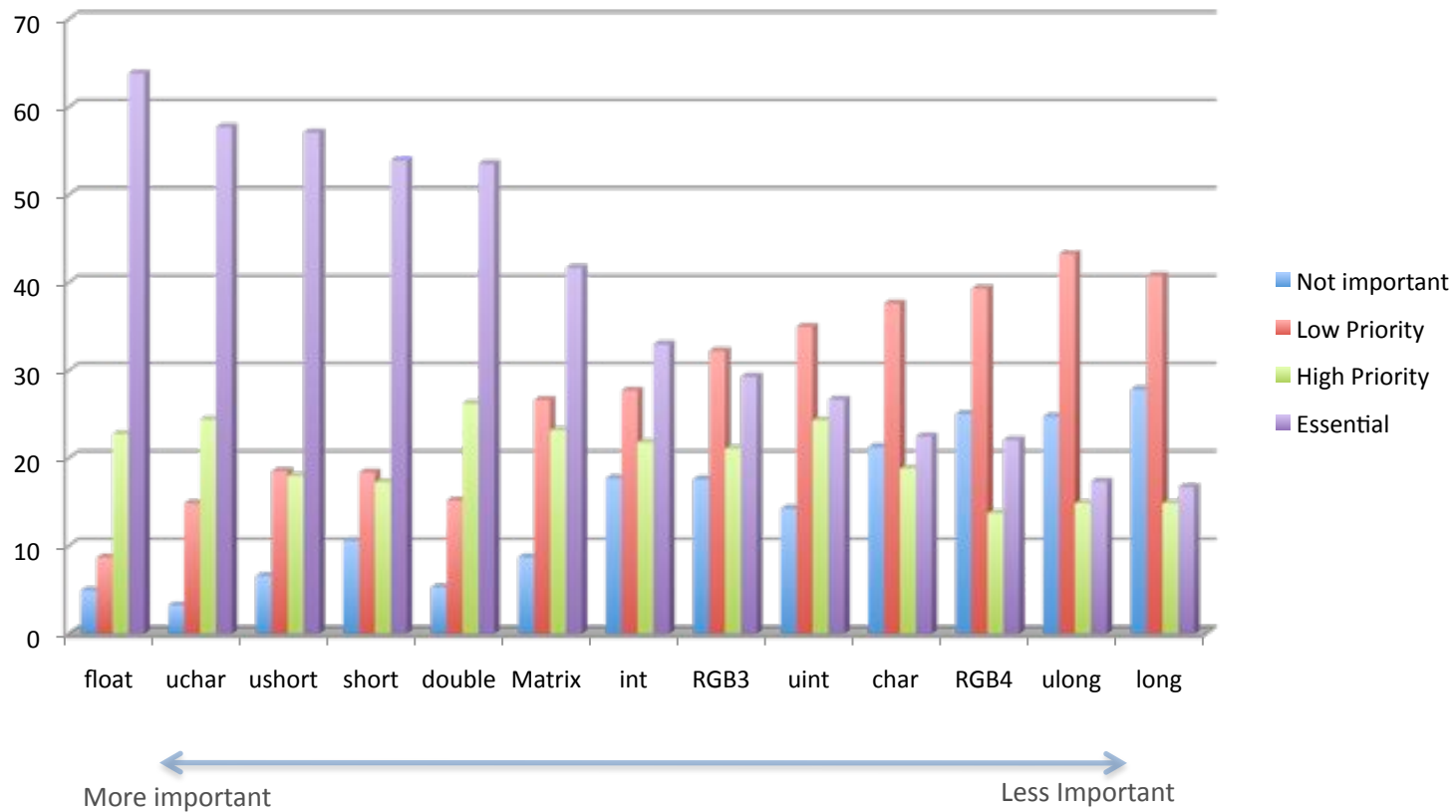


It seems that the most important features are:

1. Registration
2. Filters
3. Region Growing
4. Convert

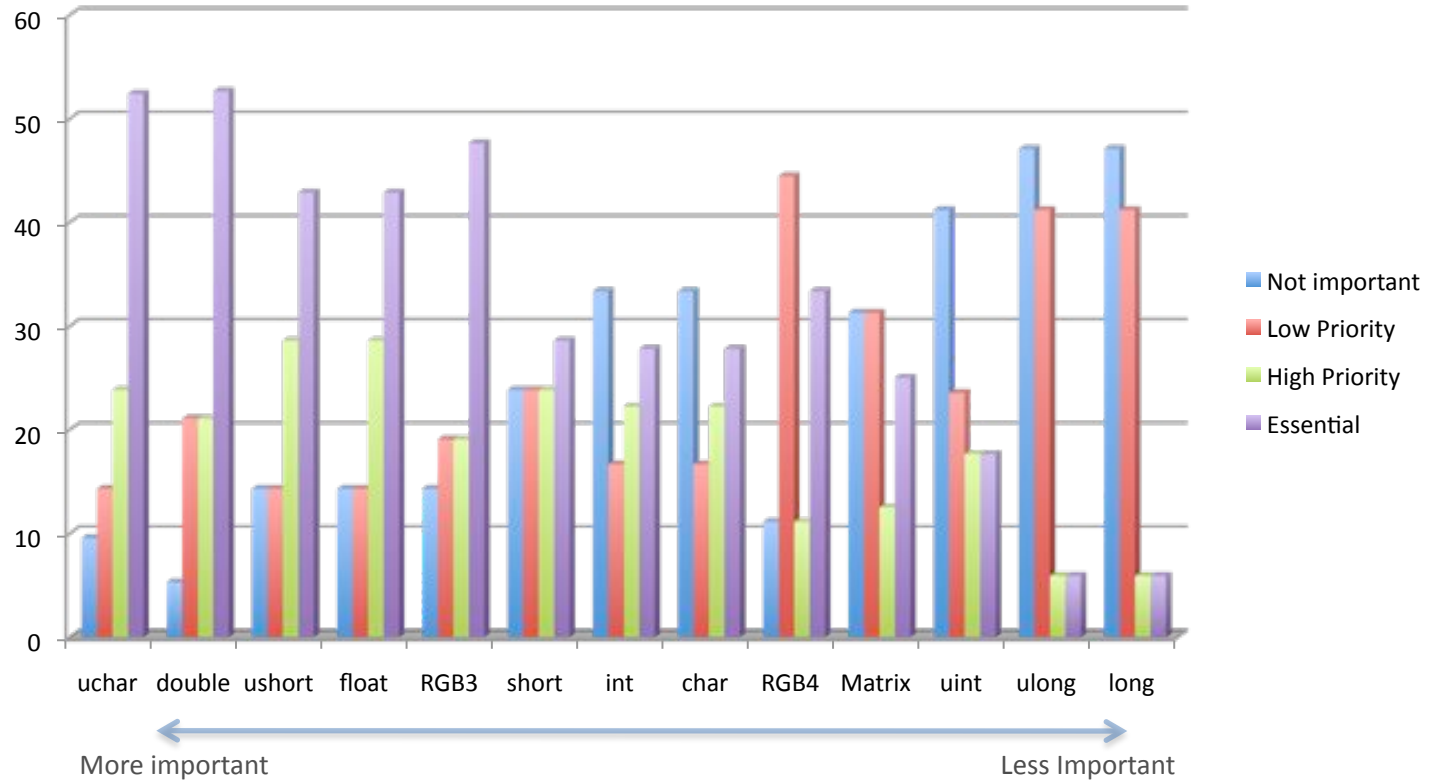
Pixel Type: Overall

Pixel Type: Overall



Pixel Type: Non-ITK Users

Pixel Type: Non-ITK Users



Top 6 (Non-ITK users)

1. uchar
2. double
3. ushort
4. float
5. RGB3
6. short

Top 6 (Overall)

1. float
2. uchar
3. ushort
4. short
5. double
6. matrix

