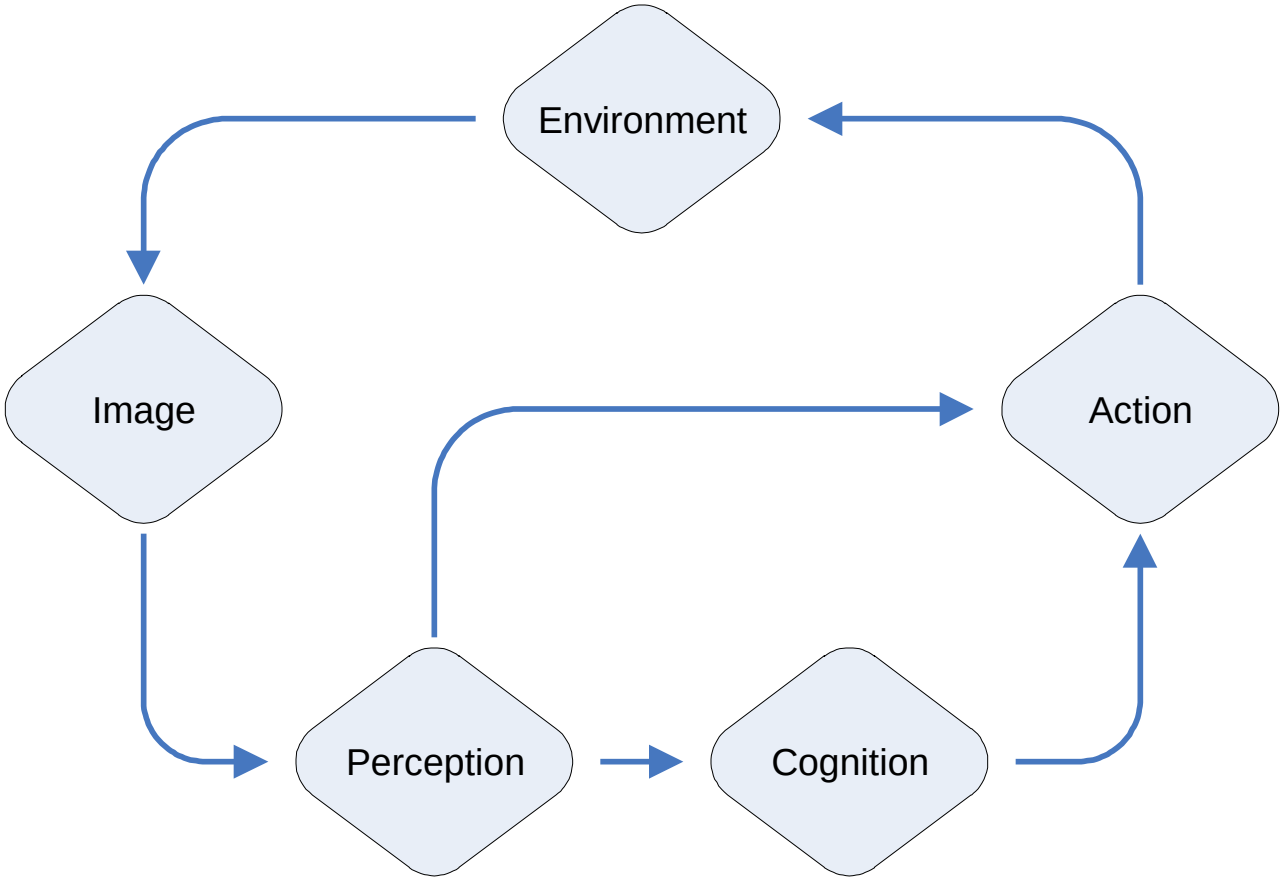
C. Batini & M. Scannapieco
Data and Information Quality Book Figures

Chapter 5: Quality of Images

Schematic overview of the interaction process by Janssen and Blommaert [342]



Images exhibiting different fidelity degrees

a) Original image

b) Quantized image

c) Compressed image

Example of image usefulness

a) A faithful image

b) A contrast enhanced image showing more details in the background

Images with decreasing degrees of naturalness with respect to a mental reference of skin color



Examples of image aesthetic.The images are shown according to the aesthetic votes given by the community of the DPChallenge (http://www.dpchallenge.com) Web site. The subject refers to the "Fan" contest


Fan-tastic sunrise
Alexkc


Face on a Hand Fan
Lawton


Forgotten Fan
KYeatts73

How image content influences quality

a) The image could be considered of poor quality because the tree was not fully captured

b) For a person hating spiders, the image may be not considered of good quality.

c) A blurred image can be considered of good quality if the content is important for the photographer

Correspondences between dimension clusters and image quality models

Model →	Fun Model			QAC Model		
Dimensions	Fidelity	Usefulness	Naturalness	Quality	Aesthetics	Content
Accuracy	X objective		X subjective	X subjective		X subjective
Completeness				X subjective		X subjective
Redundancy				X subjective		X subjective
Readability				X subjective	X subjective	X subjective
Accessibility				X subjective		X subjective
Consistency				X subjective		X subjective
Trustworthiness				X subjective		X subjective
Usefulness		X fitness for use		X subjective		X subjective

Examples of incompleteness due to different motivations

Intentional (Artistic)

Accidental

Example of minimality

188 Kb

63 Kb

33 Kb

16 Kb

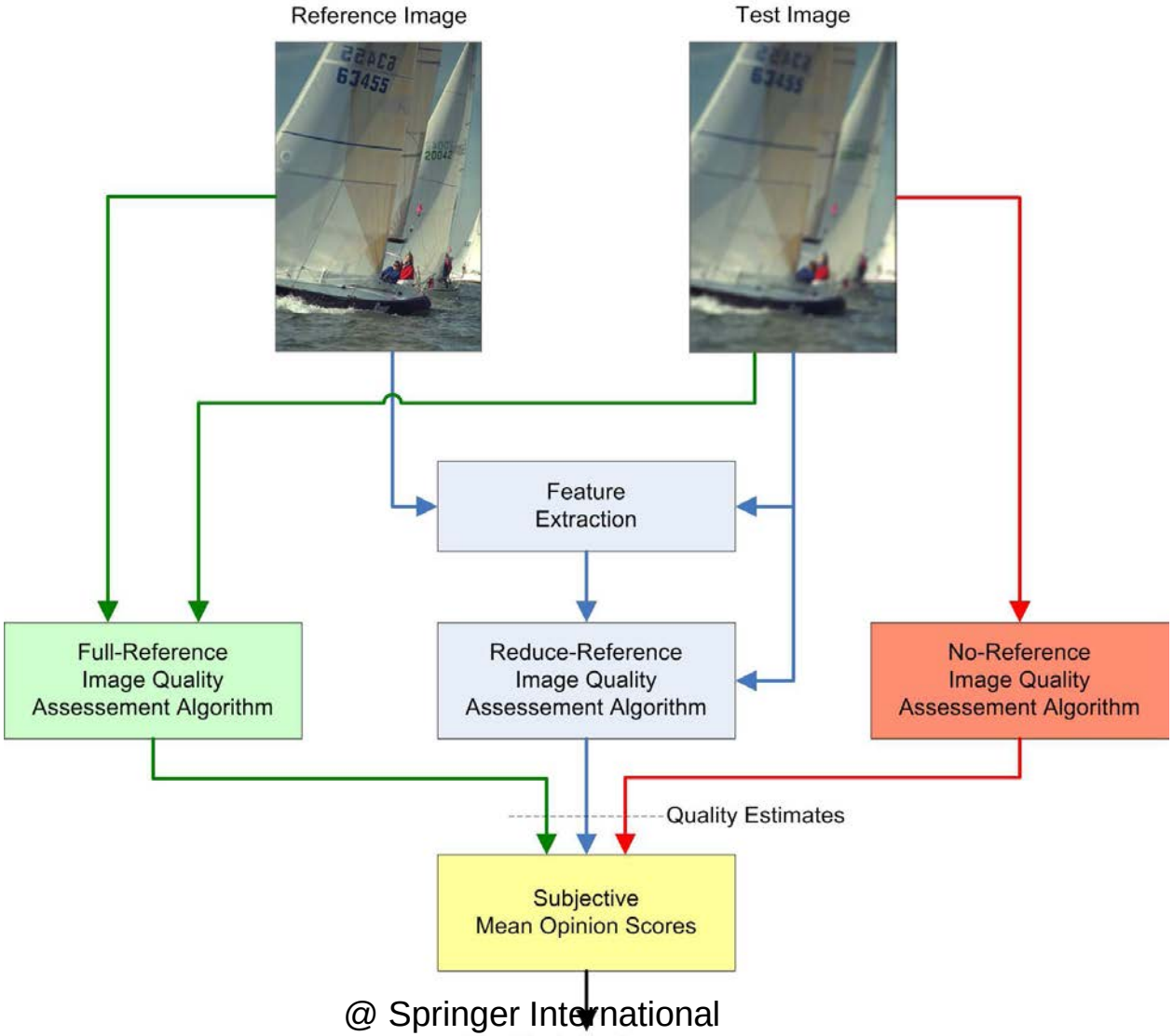
5 Kb

2 Kb

Example of tradeoff between fidelity and usefulness

Example of how the perceptual quality is influenced by the visibility of the distortion. Gaussian noise is applied to the top (left-side) and bottom (right-side) regions of the image. The image on the right is typically perceived as having higher quality than the image on the left.

Objective image quality assessment approaches



Examples of image defects detected by no-reference metrics

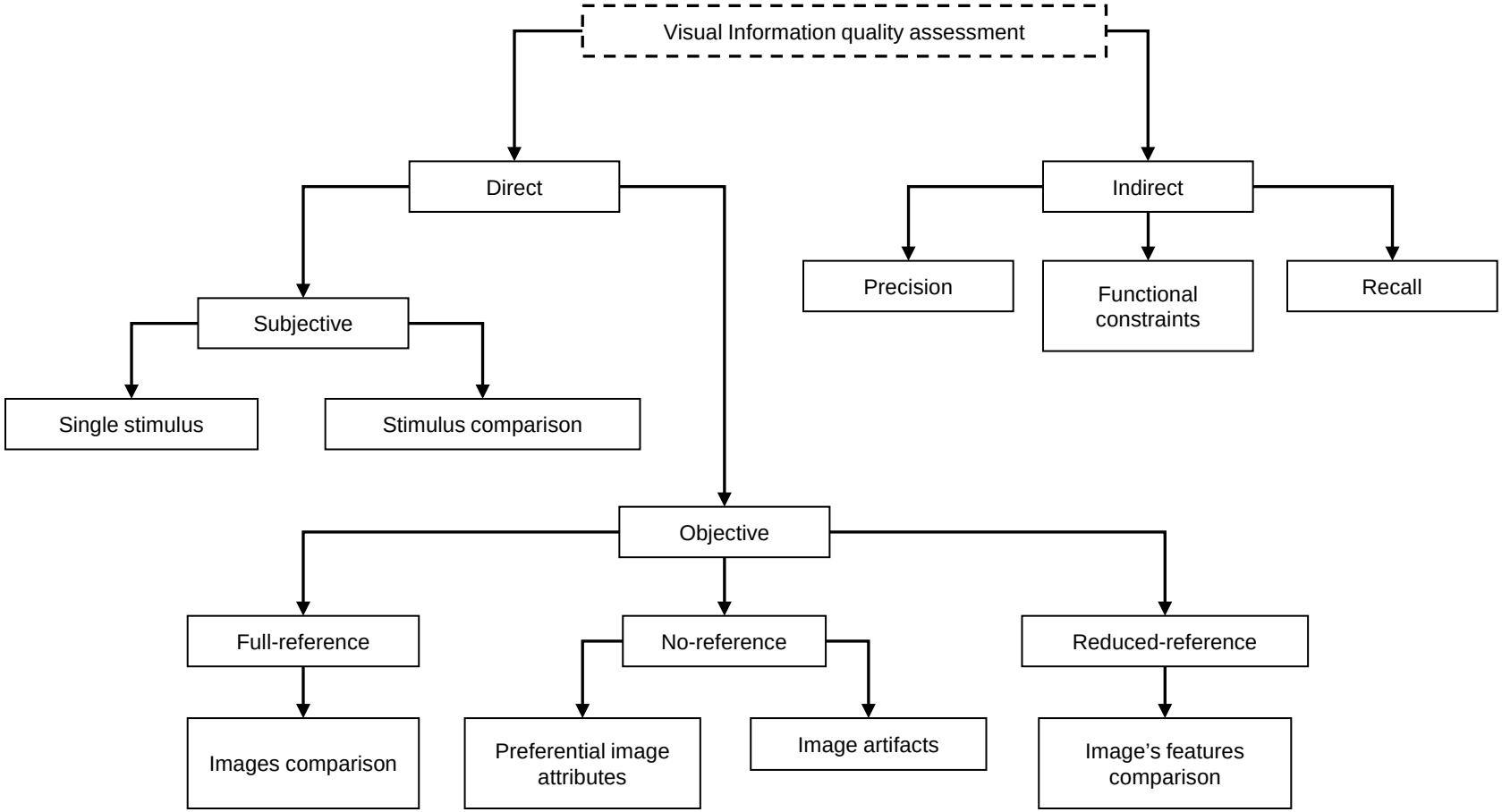
(a) Original (b) Colorfulness (c) Contrast

(d) Blockiness (e) Blurriness (f) Graininess

Significant correlations between defects and image quality dimensions

Defect → Quality Dimension	Colorfulness	Contrast	Blocking	Blurriness	Grainess
Accuracy			High negative correlation		
Fidelity			High negative correlation		
Naturalness	High non monotonic correlation	High non monotonic correlation	High negative correlation		
Usefulness			High negative correlation	High negative correlation	High negative correlation

Taxonomy of the different image quality assessment techniques



Relationship between the image production workflow chain and the image quality assessment approaches

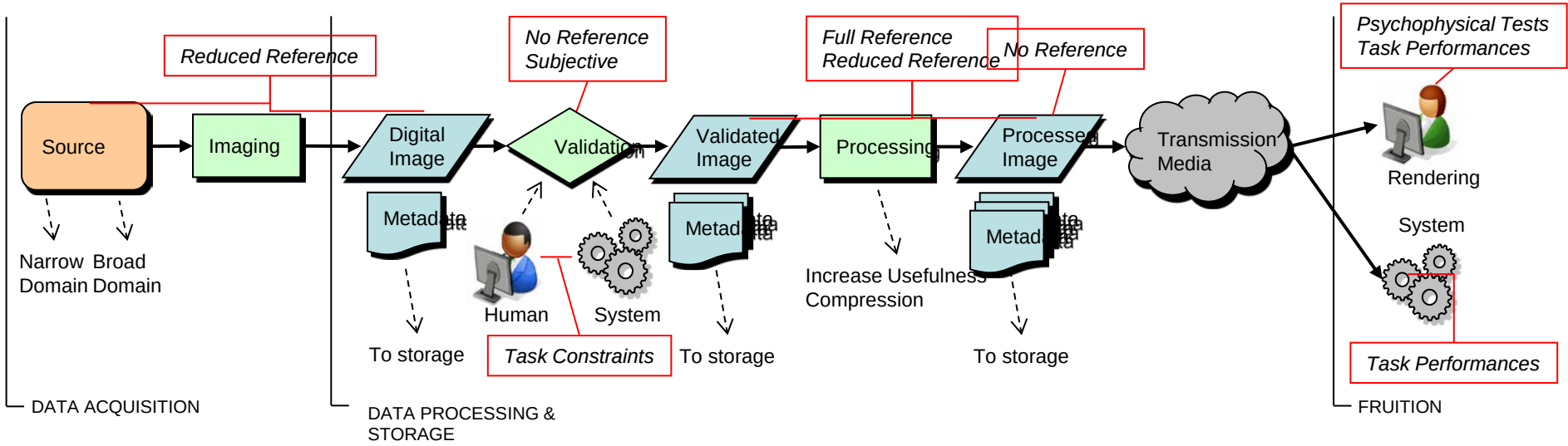


Image workflow chain of a high-quality digital images archive