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On writing a dissertation

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- What should a MSc dissertation be
- Some advice on writing a dissertation
- Major parts of a dissertation
- Other parts of a dissertation
- Bibliographic references
- About text clarity
- About layout
- Examples

- Plagiarism

A MSc Dissertation

Should be a self-contained and demonstrate that its author:

- is capable of conducting research and deserves the degree

- knows the subject

- is aware of possible alternatives to his/her approaches

- has given a contribute to the field (not mandatory for a MSc)
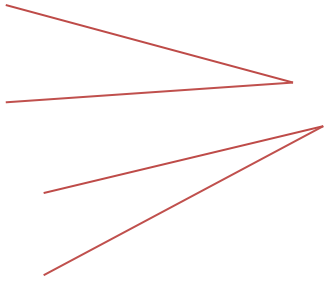
A MSc Dissertation

Should also:

- Have no more than the necessary length

- Have an adequate structure, be coherent and easy to read

- Be clear and rigorous

Some advice on writing a dissertation

- Read other dissertations submitted at your institution

- Read other dissertations on similar subjects

- Download the template from:
  http://www.ua.pt/deti/PageText.aspx?id=7976&ref=ID0EFCA/ID0ECFCA

- Write an index as soon as possible

- Begin writing as soon as possible

- Start organizing the references as soon as possible

- Define a set of rules (concerning grammar, terminology, layout, ...)

Major Parts of a Dissertation

- Title
- Abstract ——————— In Portuguese and English
- Introduction
- State of the Art
- Methods
- Results
- Discussion —————— Are often in the same chapter
- Conclusions
- Future work
- Bibliographic References

Other Parts of a Dissertation

- Index
- Acknowledgments
- Appendices
- List of figures
- List of tables
- List of symbols
- List of acronyms

    – Supplementary materials (code, videos, …in DVD or site)

Bibliographic references

- There are several types:
  - Book
  - Journal paper
  - Conference Proceedings paper
  - Thesis/ Dissertation
  - Document available at the Internet
  - …

- There are several referencing styles acceptable in our field

Choose one and apply it coherently!

Examples of Referencing Styles:
IEEE – Institute of Electrical and Electronics Engineers

[1]   A. Kerren, A. Ebert, *Human-Centered Visualization Environments*. LNCS vol. 4417, Springer, 2007.

[2]   S. Silva, B. Sousa Santos, and J. Madeira, "Exploring Different Parameters to Assess Left Ventricle Global and Regional Functional Analysis from Coronary CT Angiography," *Comput. Graph. Forum*, vol. 31, no. 1, pp. 146–159, Feb. 2012.

[3]   F. Steinicke, K. Rothaus, and K. Hinrichs, "Poster : A Virtual Body for Augmented Virtuality by Chroma-Keying of Egocentric Videos," *Proceedings of the IEEE 3D UI*, pp. 1–2, 2009.

Examples of Referencing Styles:
APA – American Psychological Association

- Andreas Kerren, Achim Ebert, and J. M. (2007). *Human-Centered Visualization Environments*. (J. M. Andreas Kerren, Achim Ebert, Ed.)*New York*. LNCS vol. 4417, Springer.

- Silva, S., Sousa Santos, B. , & Madeira, J. (2012). Exploring Different Parameters to Assess Left Ventricle Global and Regional Functional Analysis from Coronary CT Angiography. *Computer Graphics Forum*, *31*(1), 146–159.

- Steinicke, F., Rothaus, K., & Hinrichs, K. (2009). Poster : A Virtual Body for Augmented Virtuality by Chroma-Keying of Egocentric Videos. *Proceedings of the IEEE 3D UI*, 1–2.

Citing the references along the text using IEEE

According to Kerren and Ebert [1], Visualization ….

… different parameters can be used to characterize the LV function [2] …

A visual representation of the user in the Virtual Environment may have a large impact on presence [3]…

Citing the references along the text using APA

According to Kerren and Ebert (2007), Visualization ...

... different parameters can be used to characterize the LV function (Silva *et al*., 2008) ...

A visual representation of the user in the Virtual Environment has a large impact on presence (Steinicke *et al*., 2009)...

Organizing Bibliographic References

- Start organizing your references as soon as possible

- Use a managing tool and carefully define your keywords

ENDNOTE®

MENDELEY

Concerning text clarity

- The text must:
  - be accurate and clear (phrases not too long, simple, not redundant, with a correct punctuation, …)

  - have a coherent grammatical style (e.g. concerning verb tenses)

  - have correct spelling

  - have a coherent visual appearance (e.g. font, size, references, titles, …)

  - use correct translations and have foreign words written in italic
  - …

Concerning Layout

Define a Style Guide and apply it throughout the entire document!

- Begin chapters in a new page (leaving "generous" blank space on the top)
- Leave generous margins, headers and footers

- Use a readable font (size and type)
- Convey section and sub-section hierarchy through font (size, bold, …)

- Number pages
- Number chapters, sections and sub-sections
- Number figures, graphics, tables, … (preferably within each chapter)

- Figures, graphics, tables, etc. must:

  - "tell a story"
  - be cited along the text
  - have an explicit caption with a coherent format
  - cite a reference if adapted from elsewhere
  - be near their mentions in the text
  - be cited always in the same way
    (e.g., figure x, fig. x, Fig. x,…)

- The List of Acronyms should be organized alphabetically

- Words with several possible orthographies should be written using always the same spelling (eg. on-line, online)

- Choose UK English or US English and use it coherently throughout the text

Some illustrative examples from:

Generous margins, headers and footers

CHAPTER 7
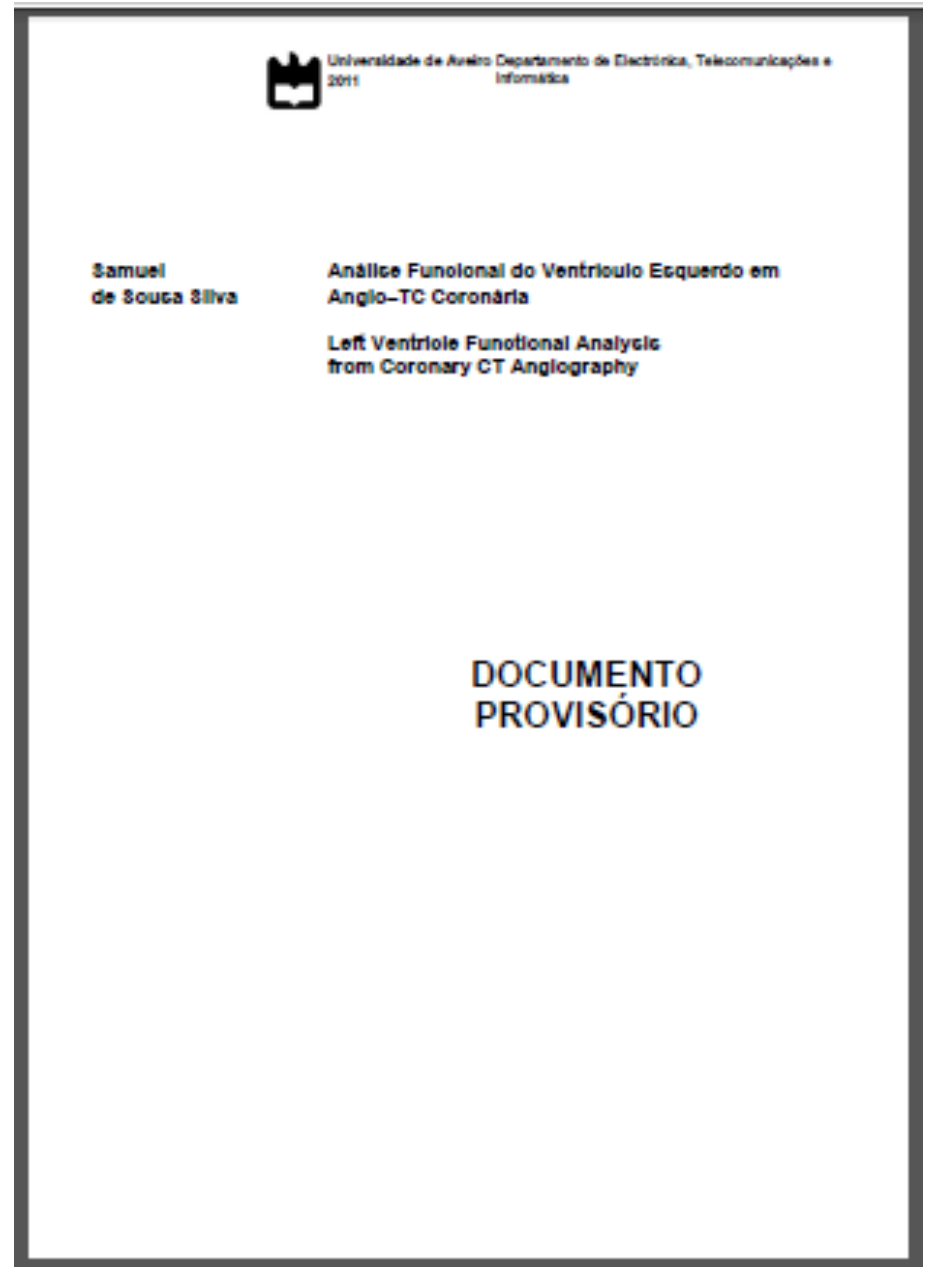
Similarity Measures for Left Ventricle Segmentations Comparison

MEDICAL image processing and analysis tools often include segmentation for quantitative measure of extent, volume and shape. Validation of new segmentation methods and tools usually implies comparing their various outputs among themselves (or with a ground truth), using similarity metrics. Several such metrics are proposed in the literature but their use is often guided by criteria resulting from their popularity in the literature.

Among the different similarity and discrepancy metrics available it is important to select those which are relevant for a particular task, as opposed to using all metrics, therefore avoiding additional computational cost and redundancy.

A methodology is proposed which enables the assessment of how different similarity and discrepancy metrics behave for a particular task and the selection of those which provide relevant data.
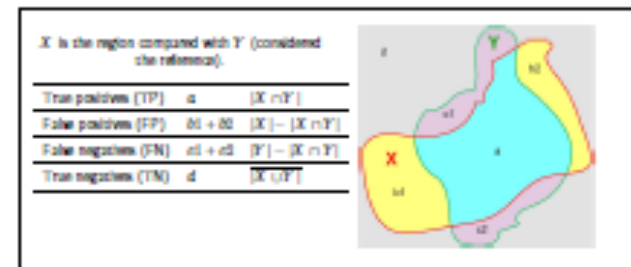
Chapter begins in a new page (leaving "generous" blank space on the top)

X is the region compared with Y (considered the reference).		
True positives (TP)	a	$|X \cap Y|$
False positives (FP)	$b1 + b2$	$|X| - |X \cap Y|$
False negatives (FN)	$c1 + c2$	$|Y| - |X \cap Y|$
True negatives (TN)	d	$\overline{|X \cup Y|}$

Figure 7.1 – Notable regions of interest when analysing the similarity between two regions X and Y.

(and as shown in figure 7.1) the various metrics will be presented for 2D (pixel sets). Nevertheless, all can be applied to 3D (voxel sets).

One of the simplest similarity measures is the Jaccard coefficient which is equal to one if the compared regions completely overlap and equal to zero if the regions do not overlap and is defined as:

$$Jac = \frac{|X \cap Y|}{|X \cup Y|} \quad (7.1)$$

An equivalent similarity measure, known as Dice coefficient can be expressed as:

$$Dice = \frac{2|X \cap Y|}{|X| + |Y|} \quad (7.2)$$

In Babalola et al. two variants of the Dice coefficient are described: the false positive Dice (FP_{Dice}), and the false negative Dice (FN_{Dice}). While the Dice coefficient conveys the level of similarity, these two discrepancy measures allow a more accurate characterization of what has happened and are defined as:

$$FP_{Dice} = \frac{2|X \cap \overline{Y}|}{|X| + |Y|} \quad (7.3)$$

$$FN_{Dice} = \frac{2|\overline{X} \cap Y|}{|X| + |Y|} \quad (7.4)$$

The Tanimoto similarity measure is defined by:

Font and numbering convey section/sub-section hierarchy:

8.2 Background Work

Evaluation of image processing methods is of paramount importance. To support the work presented in this chapter a brief overview of notable principles and applications concerning the evaluation of segmentations methods is provided.

8.2.1 Evaluation of Image Processing Methods

Zhang [30, 31] classifies segmentation evaluation methods in two main categories: analytical and empirical. The analytical methods evaluate the segmentation by looking into the segmentation algorithm and analysing its properties. On the other hand, the empirical methods evaluate the

Number within chapter:

$$E = \frac{1}{c} \sum_{i=1}^{n} \sum_{j=i}^{n} \left[\frac{(\delta_{ij} - d_{ij})^2}{\delta_{ij}} \right] \qquad (8.2)$$

$$c = \sum_{i=1}^{n} \sum_{j=i}^{n} \delta_{ij} \qquad (8.3)$$
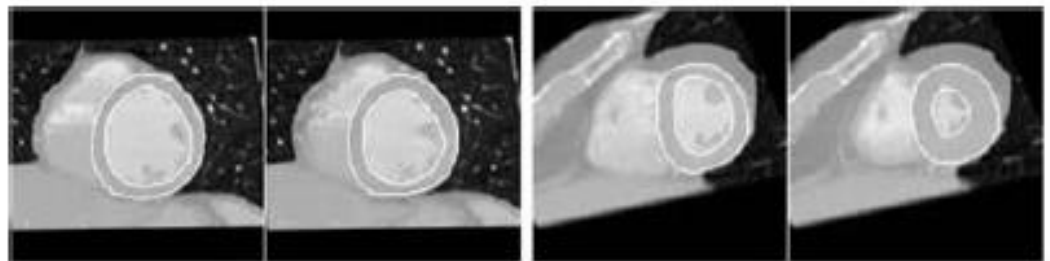
Adapted figure including reference:

Figure 4.1 − Several examples of the obtained myocardium segmentation. Image obtained from [30].

Tables and figures reporting on Author's work with explanatory legend:

Table 5.1 – Evaluation results for endocardium and epicardium segmentation.

A. Endocardium Segmentation Evaluation

Exam	End-Sistole				End-Diastole				60%			
	Apex	Mid.	Valve	Tract	Apex	Mid.	Valve	Tract	Apex	Mid.	Valve	Trac
1	O	O	-	O	O	O	O	O	O	O	+	O
2	O	O	+++	+++	O	O	++	++	O	O	+++	++
3	O	O	+	+++	O	O	O	++	O	O	++	++
4	O	O	O	+	O	O	- - -	O	O	O	- -	O
5	-	-	+++	+++	-	O	- -	- - -	-	O	+++	- -
6	O	O	++	- - -	-	O	++	- - -	-	O	+++	- -
7	-	- - -	- - -	- -	-	- - -	- -	- - -	- -	- -	++	- -

B. Epicardium Segmentation Evaluation

Exam	Apex	End-Sistole				Apex	End-Diastole			
		Mid.		Base			Mid.		Base	
		L	S	L	S		L	S	L	S
1	O	O	+++	O	+++	O	O	+++	O	+++
2	- -	O	O	O	+++	- -	O	O	O	O
3	-	O	O	O	+	-	-	-	-	-
4	O	-	+++	+++	O	O	-	++	O	O
5	- -	- -	++	++	++	- - -	+++	+++	- - -	- - -
6	- -	- -	+++	O	O	- -	-	+++	- -	O
7	- - -	- - -	++	- -	- -	- - -	- - -	-	-	-

O : Optimum   + : Excess   – : Shortage
Number of symbols conveys severity level, e.g.:   +++ : level 3 excess;   – – : level 2 shortage

Figure 6.4 – Segmentation editing by surface deformation. The editing tool is a sphere and can be used in any of the view planes. It appears in different sizes depending where the view plane intersects the sphere. On the bottom right image a 3D view of the surface (in red) and sphere (in blue) are shown
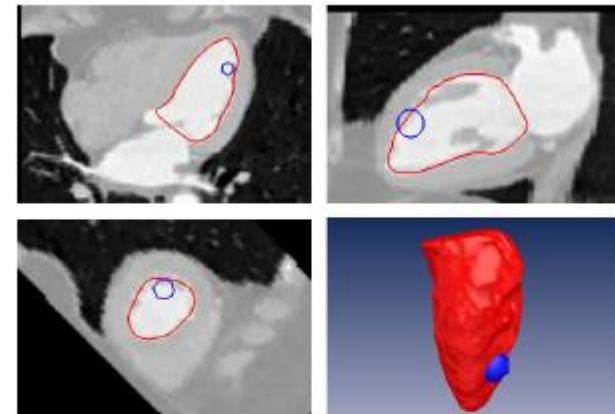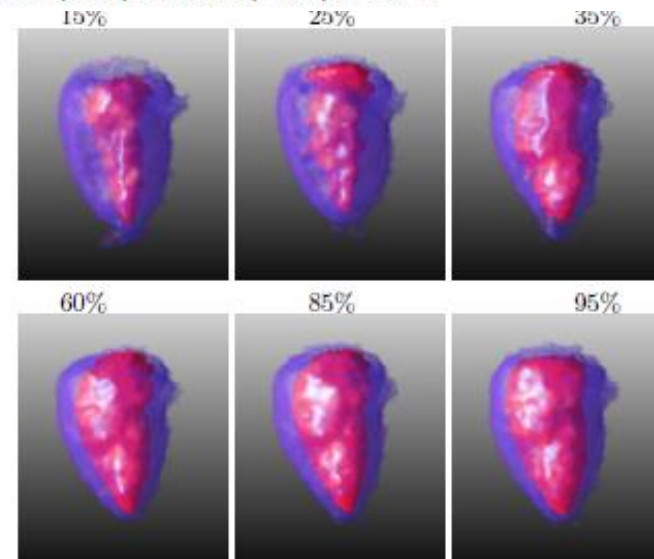
*"Using module View3D a simple three-dimensional view of the segmented data was also built.
Figure 5.12 presents several 3D visualizations of the same left ventricle in different cardiac phases."*   (Silva, 2011)

15%   25%   35%
60%   85%   95%

Figure 5.12 – Segmentations viewed using 3D models, obtained using *surface rendering*, and presenting the endocardium in red and the epicardium in blue with a degree of transparency.

List of Acronyms organized alphabetically

List of Acronyms

AHA	American Heart Association
ASM	active-shape model
AUC	area under the curve
BCLV	biplane cine left ventriculography
CHVNG/E	Centro Hospitalar de Vila Nova de Gaia/Espinho
CMR	cardiac magnetic resonance
CT	computed tomography
CTA	coronary CT angiography
CTP	myocardial CT perfusion
DTMRI	diffusion tensor magnetic resonance imaging
EBCT	electron beam CT
ECG	electrocardiogram
ES	end-systole
ESV	end-systole volume
EF	ejection fraction
GHT	generalized Hough transform
GUI	graphical user interface
ICA	invasive coronary angiograph
LA	left atrium
LV	left ventricle
LVM	left ventricular mass
MDCT	multiple detector-row computed tomography
MI	myocardial infarction
MM	myocardial mass
MPR	multi-planar reconstruction
MPS	myocardial perfusion scintigraphy

Plagiarism

- According to IEEE :

"the reuse of someone else's prior ideas, processes, results, or words without explicitly acknowledging the original author and source …

… a serious breach of professional conduct, with potentially severe ethical and legal consequences"

"… copying phrases without credit and quotation marks can be considered plagiarism … , paraphrasing done improperly can qualify as plagiarism"

http://www.ieee.org/publications_standards/publications/rights/plagiarism.html

- Five levels of plagiarism

- Corrective actions

IEEE Five levels of plagiarism:

- *"**Level One** - … uncredited verbatim copying of a full paper, or the verbatim copying of a major portion (> 50%), or verbatim copying within more than one paper by the same author(s).*

- ***Level Two** - … uncredited verbatim copying of large portion (between 20 and 50%) or verbatim copying within more than one paper by the same author(s).*

- ***Level Three** - … uncredited verbatim copying of individual elements (Paragraph(s), Sentence(s),Illustration(s), etc.) resulting in a significant portion (up to 20%) within a paper.*

- ***Level Four** - … uncredited improper paraphrasing of pages or paragraphs.*

- ***Level Five** - … credited verbatim copying of a major portion of a paper without clear delineation (e.g., quotes or indents)."*

http://www.ieee.org/publications_standards/publications/rights/ID_Plagiarism.html

IEEE Possible Corrective Actions:

" *Depending on the level of misconduct, one or all may be applied:*

- *Notice of violation in Xplore*

- *Prohibition from publishing in IEEE or periodical*

- *Rejection and return of papers in review and queues*

- *Referral to the IEEE Ethics and Member Conduct Committee*

- *Repeat offenders subject to increased penalty"*

Interesting books

- Luís A. Oliveira, *Dissertação e Tese em Ciência e Tecnologia, Guia de Boas Práticas*, LIDEL, 2011
- Umberto Eco, *Como se faz uma tese em Ciências Humanas*, Editorial Presença, 1998
- William Stunk Jr., E. B. White, *The Elements of Style,* Longman, 4th edition*,* 1999

Interesting links

- Bibliotecas da UA, *Referências bibliográficas, normas e estilos*, http://www.ua.pt/sbidm/biblioteca/PageText.aspx?id=12012 (online 2014/Nov/25)
- University of Queensland, *Referening Style Guides* https://www.library.uq.edu.au/help/referencing-style-guides (online 2014/Nov/25)
- IEEE, *A Plagiarism FAQs* http://www.ieee.org/publications_standards/publications/rights/plagiarism_FAQ.html (online 2014/Nov/25)