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50	Abstract of Dissertation	50
51	Make a concise summary that will fit in half a page. Must answer the following:	51
52	1. What is the problem that I am solving and why does it matter?	52
53	2. What are the state-of-the-art (SOTA) solutions to this problem?	53
54	3. What is the gap in the current SOTA?	54
55	4. What is your idea to address this gap?	55
56	5. Why do you think your idea will work?	56
57	6. How will you execute your idea?	57
58	7. What is the empirical evidence that your idea works?	58
59	8. What can you conclude from the study that you have accomplished?	59

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96 97		Example of a shortened caption	96

98	1. Introduction	98
99	• At least 5 pages.	99
100	• Summary of the whole thesis. Use previous studies, diagrams, and illustrations to	100
101	emphasize the motivation behind this thesis.	101
102	• Must answer the following:	102
103	1. What is the problem that I am solving and why does it matter?	103
104	2. What are the state-of-the-art (SOTA) solutions to this problem?	104
105	3. What is the gap in the current SOTA?	105
106	4. What is your idea to address this gap?	106
107	5. Why do you think your idea will work?	107
108	6. How will you execute your idea?	108
109	7. What is the empirical evidence that your idea works?	109
110	8. What can you conclude from the study that you have accomplished?	110
111	9. What are the possible future works that will extend your study?	111
112	• List the roadmap to the rest of the manuscript.	112
113	Start Strong: For every chapter (except possibly the Problem Statement), make an	113
114	introduction (2 or 3 paragraphs) on what the chapter is all about.	114
115	Stay Strong: Explain ideas in the simplest and most direct way that many people in	115
116	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	116
117	concise introduction. Point the reader to a reference for further understanding. Each chapter	117
118	should be complete or stand-alone and concise.	118
119	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	119
120	points discussed in the chapter.	120
121	1.1. Scope and Limitations	121
122	What is the scope of your work? What are its limitations?	122

123	1.2. Structure	123
124	This thesis is organized as follows. In Chapter 2, the discussion on the body of work	124
125	contextualizes our approach. Chapter 3 discusses the problem statement of this thesis. In	125
126	Chapter 4, the methodology is discussed in more detail. Chapter 5 contains the evaluation	126
127	results, while Chapter 6 contains the analysis and discussion. The thesis is concluded in	127
128	Chapter 7.	128

129	2. Related Work	129
130	• Expound #2 (What are the state-of-the-art (SOTA) solutions to this problem?) and #3	130
131	(What is the gap in the current SOTA?) by rigorously enumerating related works and	131
132	analyzing these in the context of the problem that you are solving.	132
133	• Build a taxonomy or survey to narrow down the field of study of the problem and to	133
134	limit the scope of your thesis. If there is a recent survey paper in your problem, use it.	134
135	If none, use Google Scholar to build a tree diagram of related work.	135
136	• Build a table or graph with metrics to show what are available features and what are	136
137	lacking in the current SOTA.	137
138	• Using the table/graph, identify the gap to show what do you intend to solve.	138
139	• Introduce the idea on how to solve this gap.	139
140	2.1. Chapter Summary	140
141	Start Strong: For every chapter (except possibly the Problem Statement), make an	141
142	introduction (2 or 3 paragraphs) on what the chapter is all about.	142
143	Stay Strong: Explain ideas in the simplest and most direct way that many people in	143
144	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	144
145	concise introduction. Point the reader to a reference for further understanding. Each chapter	145
146	should be complete or stand-alone and concise.	146
147	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	147
148	points discussed in the chapter.	148

149	3. Problem Statement	149
150	• Following up from #3 (What is the gap in the current SOTA?), formalize the main	150
151	problem and subproblems using a list.	151
152	• Use math models and diagrams to clearly show the problem and subproblems being	152
153	addressed (e.g. prior work uses $P(\mathbf{y} \mathbf{y}_{< t}, \mathbf{x})$ as the model, while we use $P(\mathbf{y} \mathbf{y}_{\neq t}, \mathbf{x})$).	153
154	Start Strong: For every chapter (except possibly the Problem Statement), make an	154
155	introduction (2 or 3 paragraphs) on what the chapter is all about.	155
156	Stay Strong: Explain ideas in the simplest and most direct way that many people in	156
157	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	157
158	concise introduction. Point the reader to a reference for further understanding. Each chapter	158
159	should be complete or stand-alone and concise.	159
160	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	160
161	points discussed in the chapter.	161
162	3.1. Objectives	162
163	The specific objectives of this thesis are:	163
164	1. Propose a new method X to solve problem Y.	164
165	2. Compare methods A, B, and C against our method X.	165

166	4. Methodology	166
167	• Expound #4 (What is your idea to address this gap?), #5 (Why do you think your idea	167
168	will work?), and #10 (Introduce the idea on how to solve this gap).	168
169	• Propose a solution. Use math models, diagrams, and algorithms to formalize your	169
170	method.	170
171	• Cite related literature of the building blocks used in the proposed method.	171
172	• Justify every decision in your proposed method (e.g. we used batch normalization to	172
173	stabilize the training)	173
174	4.1. Style and Formatting	174
175	4.1.1. Mathematics	175
176	Please number all of your sections and displayed equations as in these examples:	176
	$E = m \cdot c^2 \tag{4.1}$	
177	and	177
	$v = a \cdot t. \tag{4.2}$	
178	It is important for readers to be able to refer to any particular equation. Just because you did	178
179	not refer to it in the text does not mean some future reader might not need to refer to it. It is	179
180	cumbersome to have to use circumlocutions like "the equation second from the top of page 3	180
181	column 1". (Note that the ruler will not be present in the final copy, so is not an alternative	181
182	to equation numbers). All authors will benefit from reading Mermin's description of how to	182
183	write mathematics: http://www.pamitc.org/documents/mermin.pdf.	183

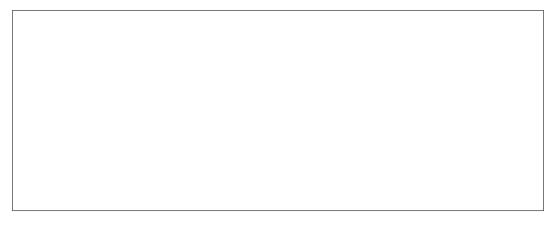


Figure 4.1. Example of a long caption title to demonstrate how to use the optional caption parameter. It is set in Roman so that mathematics (always set in Roman: $B \sin A = A \sin B$) may be included without an ugly clash.

184	4.1.2. Footnotes	18
185	Please use footnotes ¹ sparingly. Indeed, try to avoid footnotes altogether and include	18
186	necessary peripheral observations in the text (within parentheses, if you prefer, as in this	180
187	sentence). If you wish to use a footnote, place it at the bottom of the page on which it is	18
188	referenced. Use Times 10-point type, single-spaced.	18
189	4.1.3. Cross-references	18
190	For the benefit of author(s) and readers, please use the	19
191		19
192	command for cross-referencing to figures, tables, equations, or sections. This will	19:
193	automatically insert the appropriate label alongside the cross-reference as in this example:	19
194	To see how our method outperforms previous work, please see Figure 4.1 and	19
195	Table 4.1. It is also possible to refer to multiple targets as once, $e.g.$ to Figures 4.1	19
196	and 4.2a. You may also return to Section 4.1 or look at Equation (4.2).	19
197	If you wish to abbreviate the label, you can use the	19
198		19
199	command. Here is an example:	19
200	Fig. 4.1 is also quite important.	20

¹This is what a footnote looks like. It often distracts the reader from the main flow of the argument.

Table 4.1. Results. Ours is better. Note that table captions should be placed above, in contrast to figure captions which are positioned below.

Method	Frobnability
Theirs	Frumpy
Yours	Frobbly
Ours	Makes one's heart Frob

201	4.1.4. References	201
202 203	List and number all bibliographical references in 12-point Times, single-spaced, at the end of your manuscript. To make a reference in the text, use the	202 203
204		204
205	command instead of plain , for example [6]. Where appropriate, include	205
206	page numbers and the name(s) of editors of referenced books. When you cite multiple papers	206
207	at once, please make sure that you cite them in numerical order like this [1, 2, 4-6]. If you	207
208	use the template as advised, this will be taken care of automatically.	208
209	4.1.5. Illustrations, graphs, and photographs	209
210	All graphics should be centered. In LATEX, avoid using the center environment for	210
211	this purpose, as this adds potentially unwanted whitespace. Instead use	211
212	\centering	212
213	at the beginning of your figure. Please ensure that any point you wish to make is	213
214	resolvable in a printed copy of the paper. Resize fonts in figures to match the font in the	214
215	body text, and choose line widths that render effectively in print. Readers (and reviewers),	215
216	even of an electronic copy, may choose to print your paper in order to read it. You cannot	216
217	insist that they do otherwise, and therefore must not assume that they can zoom in to see tiny	217
218	details on a graphic.	218
219	When placing figures in LATEX, it's almost always best to use \includegraphics,	219
220	and to specify the figure width as a multiple of the line width as in the example below	220
221	\usepackage{graphicx}	221
222	\includegraphics[width=0.8\linewidth]	222
223	<pre>{myfile.pdf}</pre>	223



(a) An example of a subfigure.

(b) Another subfigure.

Figure 4.2. Example of a short caption title. It should be centered.

224	4.1.6. Color	224
225	If you use color in your plots, please keep in mind that a significant subset of reviewers	225
226	and readers may have a color vision deficiency; red-green blindness is the most frequent	226
227	kind. Hence avoid relying only on color as the discriminative feature in plots (such as red vs.	227
228	green lines), but add a second discriminative feature to ease disambiguation.	228
229	4.1.7. Miscellaneous	229
230	Compare the following:	230
231	$conf_a$	23
201	<pre>\$\mathit{conf}_a\$ conf_a</pre>	23
232	See The TEXbook, p165.	232
233	The space after $e.g.$, meaning "for example", should not be a sentence-ending space.	233
234	So $e.g.$ is correct, $e.g.$ is not. The provided $\backslash eg$ macro takes care of this.	234
235	When citing a multi-author paper, you may save space by using "et alia", shortened to	235
236	"et al." (not "et. al." as "et" is a complete word). If you use the \etal macro provided, then	236
237	you need not worry about double periods when used at the end of a sentence as in Alpher et	237
238	al. However, use it only when there are three or more authors. Thus, the following is correct:	238
239	"Frobnication has been trendy lately. It was introduced by Alpher [1], and subsequently	239
240	developed by Alpher and Fotheringham-Smythe [2], and Alpher et al. [3]."	240
241	This is incorrect: " subsequently developed by Alpher et al. [2]" because	24
242	reference [2] has just two authors.	242

243	4.2. Chapter Summary	243
244	Start Strong: For every chapter (except possibly the Problem Statement), make an	244
245	introduction (2 or 3 paragraphs) on what the chapter is all about.	245
246	Stay Strong: Explain ideas in the simplest and most direct way that many people in	246
247	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	247
248	concise introduction. Point the reader to a reference for further understanding. Each chapter	248
249	should be complete or stand-alone and concise.	249
250	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	250
251	points discussed in the chapter.	251

252	5. Results	252
253	• Expound #6 (How will you execute your idea?) and #7 (What is the empirical evidence	253
254	that your idea works?).	254
255	• Make a complete description of your experimental setup (e.g. dataset, train and	255
256	test/validation configurations, hardware configurations, software framework).	256
257	• Describe the metrics (performance measures) that are used to benchmark the task.	257
258	These are the same metrics in the review of lit. Sometimes, you may need to introduce	258
259	new metrics. However, you have to have a strong justification on why there is a need	259
260	for a new metric and it is a good measure of performance in a task.	260
261	• Make sure the metrics are comprehensive (e.g. include model parameter count, FLOPS,	261
262	inference time, memory use, energy consumption, etc.).	262
263	• Use graphs and tables to summarize the quantitative results from your proposed	263
264	method vs SOTA.	264
265	• Illustrate sample outputs to qualitative describe the results of your experiments.	265
266	5.1. Chapter Summary	266
267	Start Strong: For every chapter (except possibly the Problem Statement), make an	267
268	introduction (2 or 3 paragraphs) on what the chapter is all about.	268
269	Stay Strong: Explain ideas in the simplest and most direct way that many people in	269
270	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	270
271	concise introduction. Point the reader to a reference for further understanding. Each chapter	271
272	should be complete or stand-alone and concise.	272
273	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	273
274	points discussed in the chapter.	274

275	6. Analysis and Discussion	275
276	• As a follow up of #7 (What is the empirical evidence that your idea works?), given the	276
277	experimental results, make an in-depth analysis and discussion to argue and justify	277
278	that your proposed method works.	278
279	• Use further evidences (e.g. attention maps) to emphasize the strong points of your	279
280	method.	280
281	• Make an ablation study (e.g. what if we vary the depth of the network, what if we	281
282	introduce data corruption, etc.) to further show strong/weak points of your proposed	282
283	method.	283
284	• No method is perfect. What are the failure cases of your method (e.g. method does not	284
285	work on rotated text). Explain why your method fails in these cases.	285
286	6.1. Chapter Summary	286
287	Start Strong: For every chapter (except possibly the Problem Statement), make an	287
288	introduction (2 or 3 paragraphs) on what the chapter is all about.	288
289	Stay Strong: Explain ideas in the simplest and most direct way that many people in	289
290	your field can understand. If a certain topic is a bit specialized or hard to remember, make a	290
291	concise introduction. Point the reader to a reference for further understanding. Each chapter	291
292	should be complete or stand-alone and concise.	292
293	Finish Strong: At the end, make a summary (2 or 3 paragraphs) to re-emphasize the	293
294	points discussed in the chapter.	294

295	7. Conclusion	295
296 297	• Expound #8 (What can you conclude from the study that you have accomplished?) and #9 (What are the possible future works that will extend your study?).	296 297
298	• Please summarize all important points of your thesis (i.e. from the beginning to end).	298
299	• What are the future unsolved issues in your thesis?	299
300	• How other researchers can take off from your outputs?	300
301	7.1. Limitations and Future Work	301
302	What are the limitations of your work? Given these, what are possible future research	302
303	directions?	303

304	Bi	ibliography	304
305 306	[1]	F. Alpher, "Frobnication," <i>IEEE TPAMI</i> , vol. 12, no. 1, pp. 234–778, 2002 (cit. on pp. 7, 8).	305 306
307 308	[2]	F. Alpher and F. Fotheringham-Smythe, "Frobnication revisited," <i>Journal of Foo</i> , vol. 13, no. 1, pp. 234–778, 2003 (cit. on pp. 7, 8).	307 308
309 310	[3]	F. Alpher, F. Fotheringham-Smythe, and F. Gamow, "Can a machine frobnicate?" <i>Journal of Foo</i> , vol. 14, no. 1, pp. 234–778, 2004 (cit. on p. 8).	309 310
311 312	[4]	F. Alpher and F. Gamow, "Can a computer frobnicate?" In <i>CVPR</i> , 2005, pp. 234–778 (cit. on p. 7).	311 312
313 314	[5]	F. LastName, <i>Frobnication tutorial</i> , Supplied as supplemental material tr.pdf, 2014 (cit. on p. 7).	313 314
315 316	[6]	F. LastName, <i>The frobnicatable foo filter</i> , Face and Gesture submission ID 324. Supplied as supplemental material fg324.pdf, 2014 (cit. on p. 7).	315 316

317	A. Additional Results and Discussion	317
318	In this appendix, we present and discuss additional results.	318

319	B.	Background Material	319
320		In this appendix, we discuss some helpful background material.	320