II2202: Writing an abstract with keywords

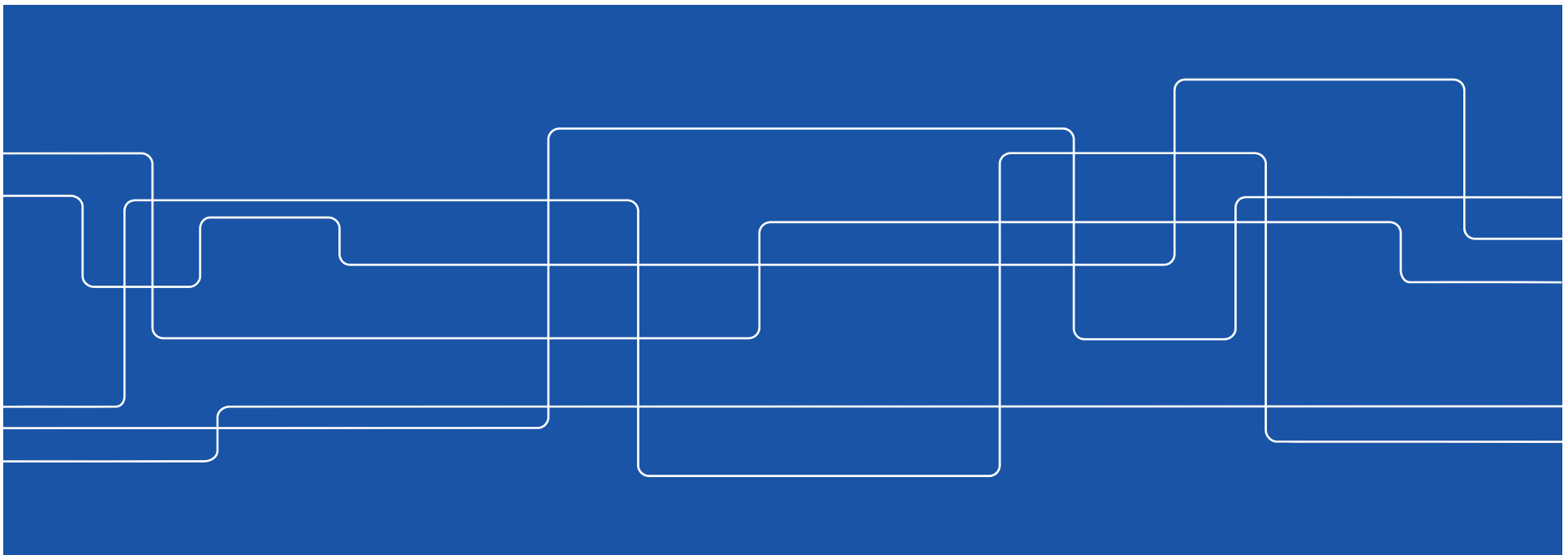prof. Gerald Q. Maguire Jr.   http://people.kth.se/~maguire/

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What is the purpose of an abstract?

1. Briefly summarize your document
2. To help your reader decide whether they should read your paper or not
3. To help *potential* readers to find your document
4. To help make your work **visible** to others

A abstract should ***stand on its own***, i.e., no citations, cross references to the body of the document, acronyms must be spelled out, …

Note: Many readers will *only* read your abstract!

What are the components of an abstract?

- Motivation – provides context (optional)
- Problem statement
- Method(s) – approach chosen to solve problem
- Results
- Conclusions

For a short description of how to write an abstract, see:
Philip Koopman, [How to Write an Abstract](), Essay, Carnegie Mellon University, October, 1997.

What is in a Master's thesis abstract?

Problem

Motivation

Method(s)

Results

- What is the topic area? (optional)
- Short problem statement
- Why was this problem worth an Master's thesis project? (i.e., why is the problem both significant and of suitable degree of difficulty for a Master's thesis project? Why has no one else solved it yet?)
- How did you solve the problem? What was your method/insight?
- **Results/Conclusions/Consequences/Impact**: What are your key results/conclusions? What will others do based upon your results? What can be done now that you have finished - that could not be done before your thesis project was completed?

End the page with a short list of keywords

How long is a thesis abstract?

Length of thesis abstracts at ICT in the period from 2010 to 2014.06.30

All examiners		Maguire		
in English	Swedish	in English	Swedish	description
241	207	289	207	median
62	61	100	98	minimum (non-zero)
644	572	606	509	maximum

Approximately 90% of all English language abstracts for theses examined by prof. Maguire are between 200 and 450 words.

Note that databases such as ProQuest Dissertations & Theses (PQDT) limit abstracts to 350 words. While Canada's National Archive limits Masters thesis abstracts to 150 words (Doctoral dissertations to 350 words). Chalmers University of Technology suggests a Master's thesis abstract should be between 250 and 350 words.

Histogram of number of words in ICT thesis abstracts

Histogram of length (in words) of English language abstracts for ICT theses 1996-2014.06.30
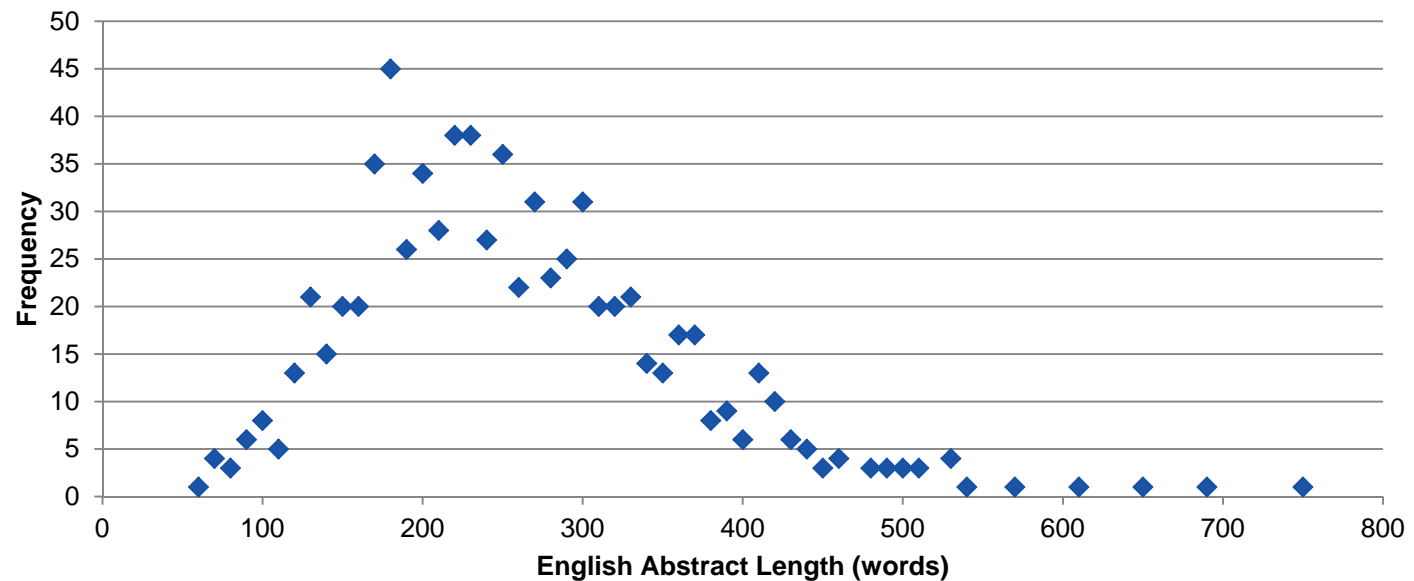
At KTH, every thesis <u>must</u> have an abstract in both Swedish and English

"Language Policy for KTH 2010", Dnr V-2009-0365, doss 1, section 4.10 Abstracts of dissertations and theses "Every Master's dissertation, licenciate thesis and doctoral thesis that is written in English is to include a Swedish Abstract. Similarly, every dissertation or thesis written in Swedish is to have an English Abstract."

http://intra.kth.se/en/regelverk/policyer/sprakpolicy-for-kth-2010-1.60909

All theses are to be reported in KTH's Digitala Vetenskapliga Arkivet (DiVA) since 1 January 2011 according to **"Elektronisk registrering av examensarbeten i DiVA"** **Beslutsnummer:** UF-2010/0650

Keywords

Choosing good keywords can help others to locate your paper, thesis, dissertation, … and <u>related</u> work.

Choose the most specific keyword from those used in your domain, see for example:

ACM's Computing Classification System (2012)

(2014) IEEE Taxonomy

Mechanics:

- The first letter of a keyword should be set with a capital letter and proper names should be capitalized as usual.
- Spell out acronyms and abbreviations.
- Avoid "stop words" - as they generally carry little or no information.
- List your keywords separated by commas (",").

Since you should have both English and Swedish keywords - you might think of ordering them in corresponding order (i.e., so that the nth word in each list correspond) - thus it would be easier to mechanically find matching keywords.

New Keyword(s)?

If no existing keyword is suitable, then introducing a new keyword - but remember that doing so may make it harder for someone else to find your thesis.

This will typically only be necessary when a new keyword comes into use due to the evolution of a field. [Note: Former IEEE Transactions on Antennas and Propagation Editor-in-Chief, L. Wilson Pearson, added only 150 new keywords in the 2-1/2 years he was editor]

Think about **what someone else would use as a keyword** to find your thesis along with related theses and other related work.

How many keywords?

For theses in DiVA (2010-June 2014), the median number of keywords is 5 [a minimum of 1, a maximum of 43 (English) 146 (Swedish), and a minimum and maximum standard deviation ranging from 3 to 5]

$\Rightarrow$ A typical thesis should have 5-6 keywords

Many publications enforce a limit of 4-10 keywords

Keywords in ICT theses (2010-June 2014)

Number of Keywords: Frequency for theses at ICT
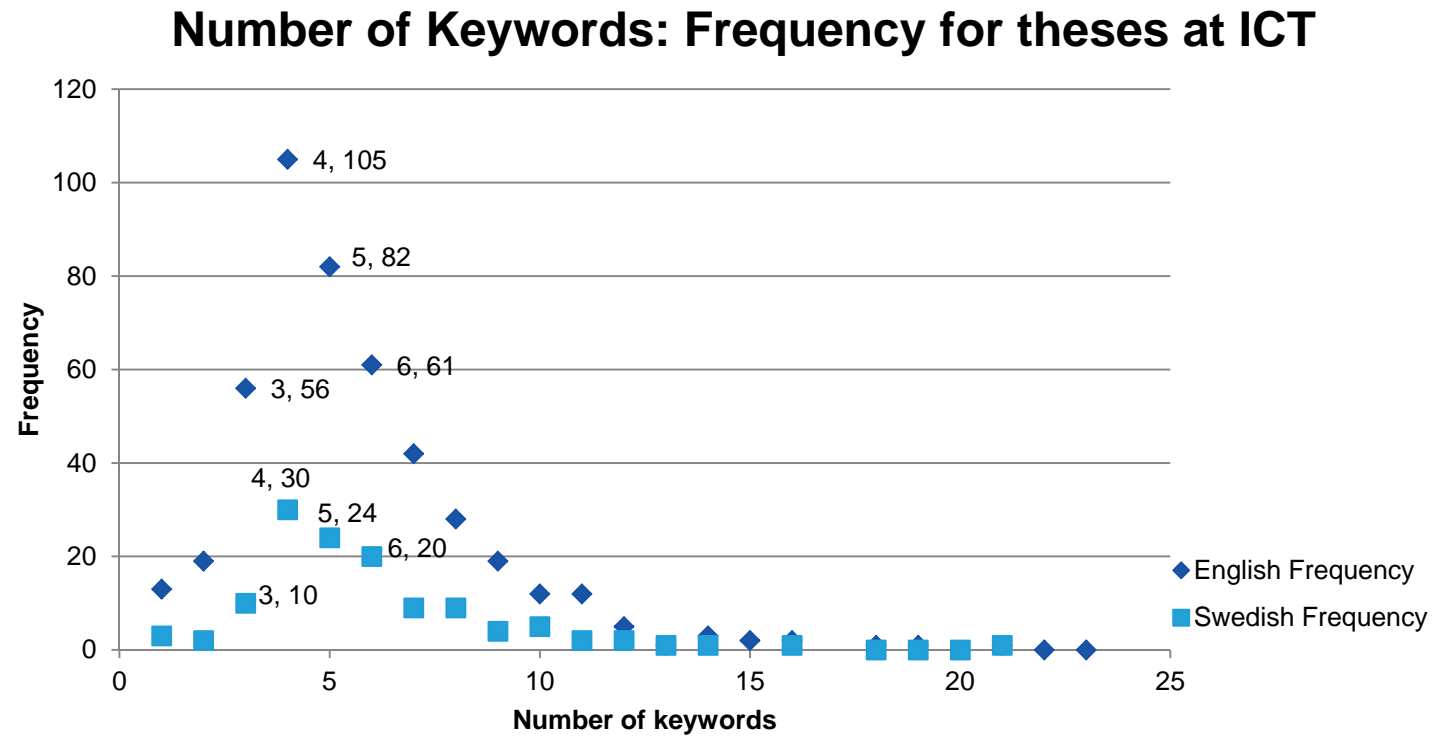
3 to 6 keywords are common

Collected keywords

ICT	EES	CSC	ITM	ABE	SCI	CHE	STH	ECE
system|s	system|s	system|s	system|s	building|s	model|s	material|s	work|s	school|s
network|s	model|s	method|s	energy	energy	method|s	water|s	system|s	student|s
service|s	power|s	user|s	work|s	system|s	system|s	sample|s	service|s	teachers
user|s	control|s	data	model|s	area|s	data	process	method|s	management
application|s	network|s	algorithm|s	development|s	method|s	simulation|s	method|s	data	ICT
data	method|s	model|s	product|s	environmental	order|s	properties	level|s	program|s
mobile|s	data	work|s	method|s	construction|s	time|s	showed	patient|s	waste
solution|s	simulation|s	time|s	process|s	work|s	work|s	temperature|s	environment|s	work
device|s	time|s	application|s	companies	model|s	part|s	system|s	device|s	tool|s
design|s	performance|s	information	company|s	development|s	design|s	effect|s	risk|s	development
time|s	algorithm|s	report|s	production|s	process|s	test|s	amount|s	factor|s	engineer|s
performance|s	order|s	game|s	order|s	time|s	material|s	time|s	time|s	competence
information	work|s	order|s	management|s	water|s	risk|s	production	application|s	education
model|s	application|s	solution|s	time|s	design|s	structure|s	reaction|s	model|s	interviews
work|s	sensor|s	test|s	market|s	Stockholm|'s	parameter|s	work|s	part|s	lean
communication|s	information	design|s	cost|s	cost|s	vehicle|s	c	ultrasound	Skanska
method|s	communication|s	development|s	environmental	part|s	case|s	concentration|s	order	learning
order|s	grid|s	media|s	knowledge	material|s	flow|s	oil|s	image|s	meeting|s
test|s	part|s	social	part|s	case|s	algorithm|s	pulp|s	information	part|s

…

x|s indicates the strings x and xs

Vocabulary list

https://www.kth.se/social/course/IK1552/page/vocabulary-englishswedish/

English - Word or Words	Swedish
1 pulse per second	1 puls per sekund
2D method	2D-metod
2G (Third Generation)	2G (andra generationen)
3D (three dimensional)	tre dimensionell
…	
3D-printing	3D-skrivare

…

English	Swedish
interest interests interesting interestingly	intressanta intressen intressant intressant
interface interfaces interfaced interfacing	gränssnitt gränssnitten gränssnitts gränssnitt
interface to the router system	gränssnitt till routern systemet
interfere interference	interferera störningar
intergalactic	intergalaktiska
inter-ISP traffic	inter-ISP trafik
interleaving	interfoliering
intermediate intermediary	mellanliggande mellanhand
internal	inre/intern
international	internationell
internet internetworked internetworking	net "av nätverk" internet
internet connectivity	internet-anslutning
internet of things (IoT)	Sakernas Internet
Internet Protocol (IP)	
internet service provider (ISP)	Internetleverantör
internet traffic	internettrafik
internet-draft internet-drafts	Internet-utkast
internetwork internetworking internetworked	internet Internetteknologi/samverkan "sammankopplade nätverk"

…

	English	Swedish
	zero	noll
	zero knowledge	noll kunskap
3854	zone|s	zon zoner

References

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The Institute of Electrical and Electronics Engineers (IEEE), '2014 IEEE Taxonomy: Version 1.0.' IEEE, 06-Aug-2014 [Online]. Available: https://www.ieee.org/documents/taxonomy_v101.pdf. [Accessed: 14-Aug-2015]

The Institute of Electrical and Electronics Engineers (IEEE), '2014 IEEE Thesaurus: Version 1.0.' IEEE, 05-Aug-2014 [Online]. Available: http://www.ieee.org/publications_standards/publications/services/thesaurus2.html. [Accessed: 14-Aug-2015]

Philip Koopman, How to Write an Abstract, Essay, Carnegie Mellon University, October, 1997. http://users.ece.cmu.edu/~koopman/essays/abstract.html

¿Questions?