

# CISC883: LECTURE 4

## INTRODUCTION TO

## ULSS

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Cor-Paul Bezemer

# Position Paper Assignment

- Due: Week 6, Wednesday, 19 October, 2:30 pm
  - In 1 Week !
- 2-4 page position paper discussing how one ULSS of choice matches Lampson's design principles
- Example Paper on website: Google
- 2-column IEEE style (Latex)

# Position Paper Assignment

- Don't discuss Google in your position paper !
- The more principles you discuss from Lampson's paper & discuss how your ULSS meets those principles (or doesn't), the higher your paper will be graded
- Paper will be graded as an individual assignment & papers must be unique!

# Topic Assignment

Topic	Presenter 1	Presenter 2
Large-Scale Applications	Chad	Patrick
Web APIs & Web Services	Thanh	Harshith (+ Nima)
Hosted Applications	Thanh	Sudharshan
Infrastructure for Rent	Harshith	Kanchan
Autonomic computing & monitoring platforms & approaches	Gopi	Kanchan
Mobile App Platforms	Patrick	Sudharshan (+ Nima)
Tools for Large-Scale Analysis	Chad	Gopi

# Week 6's Topic (19 Oct)

- Large Scale Applications
  - Presenters: **Chad & Patrick**
- *Remember:* Discuss the technology from a ULSS perspective
- 30 mins presentation + 15 mins questions
  - Also: 5 minutes feedback on presentation by your colleagues
  - Note: 30 mins instead of 45 mins

## Week 6's Topic (19 Oct)

- If you did not recommended a paper by now, you will get a 3% deduction from your grade
- Remember to send me a review for one of the recommended papers before next week's class
  - Any paper is fine as long as it is not the one you recommended

# Week 7's Topic

- **Web services & Web APIs:** Thanh, Harshith & Nima
- Please let me know your topic by the end of this week
- First-come, first-served !
- Discuss the technology from a ULSS perspective
- Each presentation 30mins+15mins questions

# Project Proposal

- 5-page IEEE format project proposal
  - Week 8, 2 November, 2:30 pm
- 15-minute presentation (hard limit)
  - Week 8, 2 November
- Review of three project reports
  - Week 9, 9 November, 2:30 pm



# Project Proposal

- Outline a new ULSS project by identifying a problem area & a potential solution
- An opportunity for you to think about how to outline your thesis
  - Speak to your supervisor if it is difficult to identify a research area you are interested in exploring

# Finding Academic Papers



# Previously ...



- Writing Research Papers
- Reviewing Research Papers

# Today ...



- What's new, what's great?
- What's relevant?
- Where do I look?

# Google Scholar

- Like Google Search...but for scholarly articles
  - Search: Primarily keyword-based
  - Results: rough ordering by impact (e.g. citation count), date, or relevance
  - Fast & easy
  - Don't simply rely on the 1<sup>st</sup> page of results!
- Your primary resource for finding papers about a **topic** or for an **author**
  - Doesn't provide all sources, but very comprehensive for computing research





"ultra large scale" software



Scholar

About 4,980 results (0.08 sec)

Articles

Case law

My library

Any time

Since 2015

Since 2014

Since 2011

Custom range...

Sort by relevance

Sort by date

- ☐ include patents
- ☒ include citations

📧 Create alert

**Ultra-large-scale** systems: The **software** challenge of the future

[L Northrop](#), [P Feiler](#), [RP Gabriel](#), [J Goodenough](#)... - 2006 - DTIC Document

Abstract: The US Department of Defense (DoD) has a goal of information dominance to achieve and exploit superior collection, fusion, analysis, and use of information to meet mission objectives. This goal depends on increasingly complex systems characterized by ...  
Cited by 386 Related articles All 5 versions Import into BibTeX Save More

Boa: A language and infrastructure for analyzing **ultra-large-scale software** repositories

[R Dyer](#), [HA Nguyen](#), [H Rajan](#), [TN Nguyen](#) - ... Conference on **Software** ..., 2013 - dl.acm.org

Abstract In today's **software**-centric world, **ultra-large-scale software** repositories, eg SourceForge (350,000+ projects), GitHub (250,000+ projects), and Google Code (250,000+ projects) are the new library of Alexandria. They contain an enormous corpus of **software** ...  
Cited by 48 Related articles All 10 versions Import into BibTeX Save More

Engineering of it ecosystems: design of **ultra-large-scale software**-intensive systems

[S Herold](#), [H Klus](#), [D Niebuhr](#), [A Rausch](#) - ... on **Ultra-large-scale software**- ..., 2008 - dl.acm.org

Abstract **Ultra-Large-Scale** Systems are considered to be the new system generation. For these systems current development approaches are not well suited, since they do not scale well for large systems. One view onto such systems is to see them as IT Ecosystems ...  
Cited by 20 Related articles All 3 versions Import into BibTeX Save More

A recommender system for requirements elicitation in large-scale **software** projects

[C Castro-Herrera](#), [C Duan](#), [J Cleland-Huang](#)... - Proceedings of the ..., 2009 - dl.acm.org

... Furthermore, a recent report issued by the **Software** Engineering Institute entitled "**Ultra-Large-Scale** Systems: The Future Challenge of **Software** Engineering," outlines the

# Google Scholar

- Author pages
  - List of papers by a single author tracked on Google Scholar
  - Opt-in, managed by author



Levi Lucio



Scholar

About 8,120 results (0.04 sec)

Articles

Case law

My library

### User profiles for **Levi Lucio**



**Levi Lucio**

McGill University

Verified email at cs.mcgill.ca

Cited by 516

Any time

Since 2015

Since 2014

Since 2011

Custom range...

### Replica management in the european datagrid project

..., F Donno, W Hoschek, [E Laure](#), [L Lucio](#)... - Journal of Grid ..., 2004 - Springer

Abstract Within the European DataGrid project, Work Package 2 has designed and implemented a set of integrated replica management services for use by data intensive scientific applications. These services, based on the web services model, enable ...

Cited by 60 Related articles All 6 versions Import into BibTeX Save More

### A tridimensional approach for studying the formal verification of model transformations

[M Amrani](#), [L Lúcio](#), G Selim... - ... and Validation (ICST ..., 2012 - [ieeexplore.ieee.org](#)

... University of Luxembourg (Luxembourg), Moussa.Amrani, Yves.LeTraon}@uni.lu ‡ McGill University (Canada), {[Levi](#), hv}@cs.mcgill.ca § Queen's University (Canada), {Gehan ... The second approach was found more suited for dynamic and symmetric problems. **Lucio** et al. ...

Cited by 50 Related articles All 31 versions Import into BibTeX Save More

### A technique for automatic validation of model transformations

[L Lúcio](#), [B Barroca](#), [V Amaral](#) - Model Driven Engineering Languages and ..., 2010 - Springer

☐ include patents

☒ include citations





## Levi Lucio

McGill University

Software Engineering, Formal Methods

Verified email at cs.mcgill.ca

Follow

Title 1–20

### Replica management in the european datagrid project

D Cameron, J Casey, L Guy, P Kunszt, S Lemaitre, G McCance, ...  
Journal of Grid computing 2 (4), 341-351

### A tridimensional approach for studying the formal verification of model transformations

M Amrani, L Lúcio, G Selim, B Combemale, J Dingel, H Vangheluwe, ...  
Software Testing, Verification and Validation (ICST), 2012 IEEE Fifth ...

### A technique for automatic validation of model transformations

L Lúcio, B Barroca, V Amaral  
Model Driven Engineering Languages and Systems, 136-150

### Towards a model transformation intent catalog

M Amrani, J Dingel, L Lambers, L Lúcio, R Salay, G Selim, E Syriani, ...  
Proceedings of the First Workshop on the Analysis of Model Transformations, 3-8

Cited by

Year

60 2004

50 2012

37 2010

33 2012

Google Scholar



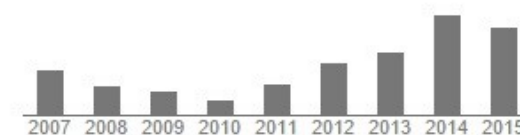
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#### Citation indices

All

Since 2010

Citations	516	325
h-index	12	10
i10-index	17	10



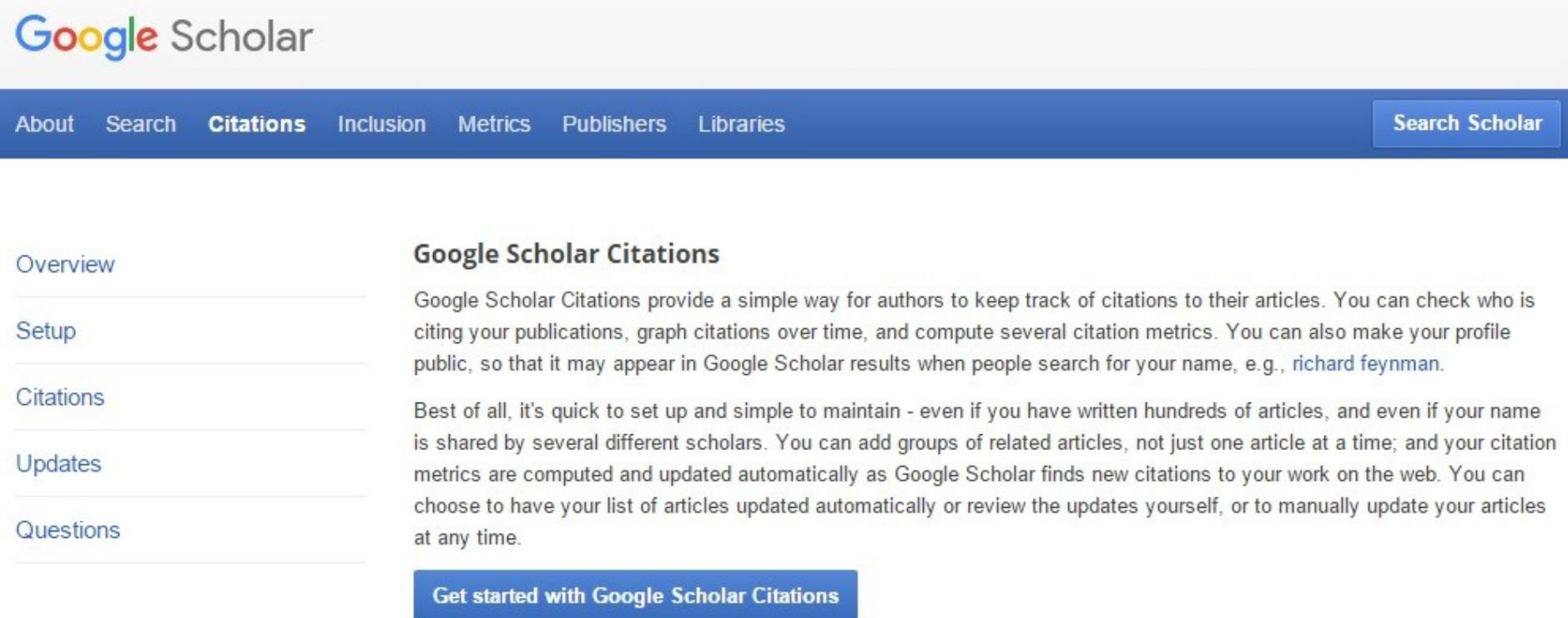
#### Co-authors View all...

Luis Velga

# Google Scholar

- To do the same, “inform” Google about your papers.  
<https://scholar.google.de/intl/en/scholar/citations.html>
- Keep track of citations to your articles:
  - who, citation #, graphical view, citation metrics

# Steps to Track Your Citations (1)

A screenshot of the Google Scholar Citations page. The header features the Google Scholar logo on the left and a navigation bar with links for About, Search, Citations (highlighted), Inclusion, Metrics, Publishers, and Libraries. A 'Search Scholar' button is on the right. A left sidebar contains links for Overview, Setup, Citations (highlighted), Updates, and Questions. The main content area is titled 'Google Scholar Citations' and contains two paragraphs of text. At the bottom, there is a blue button labeled 'Get started with Google Scholar Citations'.

Google Scholar

About Search **Citations** Inclusion Metrics Publishers Libraries [Search Scholar](#)

Overview

Setup

**Citations**

Updates

Questions

## Google Scholar Citations

Google Scholar Citations provide a simple way for authors to keep track of citations to their articles. You can check who is citing your publications, graph citations over time, and compute several citation metrics. You can also make your profile public, so that it may appear in Google Scholar results when people search for your name, e.g., [richard feynman](#).

Best of all, it's quick to set up and simple to maintain - even if you have written hundreds of articles, and even if your name is shared by several different scholars. You can add groups of related articles, not just one article at a time; and your citation metrics are computed and updated automatically as Google Scholar finds new citations to your work on the web. You can choose to have your list of articles updated automatically or review the updates yourself, or to manually update your articles at any time.

[Get started with Google Scholar Citations](#)

# Steps to Track Your Citations (2)

Step 1: Profile

Step 2: Articles

Step 3: Updates

Track citations to your publications. Appear in Google Scholar search results for your name.

Name

Use your full name as it appears on your papers. For example: Margaret Mead

Affiliation

For example: Professor of Computer Science, Stanford University

Email for verification

Use an email address at your institution. For example: yourname@mit.edu

Areas of interest

For example: Artificial Intelligence, Conservation Biology, Pricing Theory

Homepage

For example: <http://example.edu/~yourname>

Next step

# Steps to Track Your Citations (3)

Select ▼

Add

Remove...

Step 1: Profile

Step 2: Articles

Step 3: Updates

Find articles that you've written and add them to your profile. Later, you can edit or delete the articles in your profile or add more articles to your profile.

- ☒ **A tridimensional approach for studying the formal verification of model transformations**  
M Amrani, L Lúcio, G Selim, B Combemale, J Dingel... - ... , Verification and Validation (ICST), 2012 IEEE ..., 2012
- ☒ **Towards a model transformation intent catalog**  
M Amrani, J Dingel, L Lambers, L Lúcio, R Salay... - Proceedings of the First Workshop on the ..., 2012
- ☒ **Studying the impact of clones on software defects**  
GMK Selim, L Barbour, W Shang, B Adams, AE Hassan... - ... (WCRE), 2010 17th Working Conference on, 2010
- ☒ **Enhancing source-based clone detection using intermediate representation**  
GMK Selim, KC Foo, Y Zou - Reverse Engineering (WCRE), 2010 17th Working ..., 2010
- ☒ **Model transformation testing: the state of the art**  
GMK Selim, JR Cordy, J Dingel - Proceedings of the First Workshop on the Analysis of ..., 2012
- ☒ **Model transformation intents and their properties**



# Steps to Track Your Citations (4)

Step 1: Profile

Step 2: Articles

**Step 3: Updates**


- We'll use a statistical authorship model to identify new articles that you write. We may also update bibliographic information for articles in your profile or identify duplicate article entries, which could be merged or deleted. How would you like to handle these changes?
  - ☒ Automatically update the list of articles in my profile. *(recommended)*
  - ☐ Don't automatically update my profile. Send me email to review and confirm updates.
- You can also add and remove individual articles, update their bibliographic data, and merge duplicate records. Rest assured, our automatic updates will preserve your edits and will not override them.
- We'll collect and display citations to your articles from all of Google Scholar. The citations will update automatically to reflect changes in your profile and in Google Scholar.

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# Steps to Track Your Citations (5)

Verified [gehan@cs.queensu.ca](#)

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**Gehan M. K. Selim**

 Edit  Follow

School of Computing, Queen's University  
Formal Verification and Testing of Model Transformations, Classification of Model Transformations and their Verification Techniq  
Verified email at cs.queensu.ca  
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☐ Title   1–19

Cited by

Year

☐

[A tridimensional approach for studying the formal verification of model transformations](#)  
M Amrani, L Lúcio, G Selim, B Combemale, J Dingel, H Vangheluwe, ...  
Software Testing, Verification and Validation (ICST), 2012 IEEE Fifth ...

50

2012

☐

[Towards a model transformation intent catalog](#)  
M Amrani, J Dingel, L Lambers, L Lúcio, R Salay, G Selim, E Syriani, ...  
Proceedings of the First Workshop on the Analysis of Model Transformations, 3-8

33

2012

☐

[Studying the impact of clones on software defects](#)  
GMK Selim, L Barbour, W Shang, B Adams, AE Hassan, Y Zou  
Reverse Engineering (WCRE), 2010 17th Working Conference on, 13-21

33

2010

☐

[Enhancing source-based clone detection using intermediate representation](#)  
GMK Selim, KC Foo, Y Zou  
Reverse Engineering (WCRE), 2010 17th Working Conference on, 227-236

19

2010

☐

[Model transformation testing: the state of the art](#)  
GMK Selim, J Dingel, J Dingel, ...

18

2012

Google Scholar



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197

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7

7

i10-index

6

6




Year	Citations
2011	1
2012	2
2013	3
2014	4
2015	3

Co-authors

[Edit...](#)

No co-authors

# Steps to Track Your Citations (6)



**Gehan M. K. Selim**  
School of Computing, Queen's University  
Formal Verification and Testing of Model Transformations and their Verification Techniques  
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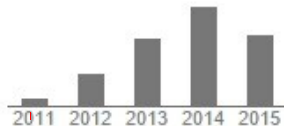
☐ Title [+ Add](#) [More](#) 1-19

	Cited by	Year
<input type="checkbox"/> <a href="#">A tridimensional approach for studying the formal verification of model transformations</a> M Amrani, L Lúcio, G Selim, B Combemale, J Dingel, H Vangheluwe, ... Software Testing, Verification and Validation (ICST), 2012 IEEE Fifth ...	50	2012
<input type="checkbox"/> <a href="#">Towards a model transformation intent catalog</a> M Amrani, J Dingel, L Lambers, L Lúcio, R Salay, G Selim, E Syriani, ... Proceedings of the First Workshop on the Analysis of Model Transformations, 3-8	33	2012

## Google Scholar

[Q](#)

Citation indices	All	Since 2010
Citations	197	197
h-index	7	7
i10-index	6	6



Year	Citations
2011	1
2012	2
2013	4
2014	8
2015	6

[Co-authors](#) [Edit...](#)

No co-authors



# Breadth-First Search: Conference Programs

- Visit conference webpages, read programs
  - Wide range of publications & authors in a general area
  - Helpful if you are doing a survey, for example

# European Conference on Modelling Foundations and Applications



Where: York, United Kingdom



When: 23rd - 24th July, 2014

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[Accepted Papers](#)

[Call for Submissions](#)

[Research Papers](#)

[Satellite Events](#)

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[Submit a Paper](#)

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[Program Committee](#)

[Organization Committee](#)

[Steering Committee](#)

[Registration and Venue](#)

[Conference Registration](#)

[How to get to York](#)

## ECMFA - STAF Planning Timetable

	Wednesday 23 July	Thursday 24 July
08h30 - 09h00	Registration desk opens	Registration desk opens
09h00 - 09h10	Opening remarks	Opening remarks
09h10 - 10h30	ECMFA Keynote: Marsha Chechik 📢	ECMFA Keynote: Darren Buttle 📢
10h30 - 11h00	Coffee (Roger Kirk Centre)	Coffee (Roger Kirk Centre)
11h00 - 12h30	<p> Session Chair: Daniel Ritter</p> <p> Jabier Martinez, Tewfik Ziadi, Jacques Klein and Yves Le Traon - Identifying and Visualising Commonality and Variability in Model Variants</p> <p> Tao Yue and Shaukat Ali - A MOF-based Framework for Defining Metrics to Measure the Quality of Models</p> <p> Yoann Laurent, Reda Bendraou, Souheib Baair and Marie-Pierre Gervais - Alloy4SPV: a Formal Framework for Software Process Verification</p>	<p> Session Chair: Gabriele Taentzer</p> <p> Amine Benelallam, Abel Gomez Llana, Gerson Sunyé, Massimo Tisi, David Launay Neo4EMF, a Scalable Persistence Layer for EMF Models</p> <p> Thomas Goldschmidt - Towards an Infrastructure for Domain-Specific Languages in a Multi-domain Cloud Platform</p> <p> Daniel Ritter - Experiences with Business Process Model and Notation for Modeling Integration Patterns</p>
12h30 - 14h00	Lunch (Roger Kirk Centre)	Lunch (Roger Kirk Centre)
	<p> Session Chair: Juan de Lara</p> <p> Anthony Anjorin, Sebastian Rose, Frederik Deckwerth and Andy Schürr - Efficient Model Synchronization with View Triple Graph Grammars</p>	

# Online Journals

- Checkout websites of known Journals/Publishers (e.g. Elsevier, Springer)
- High-quality publications surviving a rigorous review process
  - Journals collect articles in a certain area
  - Often, publications are “improved” versions of conference publications

# Software & Systems Modeling

ISSN: 1619-1366 (Print) 1619-1374 (Online)

## All Volumes & Issues

Volumes

Online First

Volume 1 / 2002 - Volume 14 / 2015

▼ **Volume 14 - 4 Issues** (February 2015 - October 2015)

Issue 4 – October 2015

Issue 3 – July 2015

Issue 2 – May 2015

Issue 1 – February 2015

▶ **Volume 13 - 4 Issues** (February 2014 - October 2014)

▶ **Volume 12 - 4 Issues** (February 2013 - October 2013)

▶ **Volume 11 - 4 Issues** (February 2012 - October 2012)

▶ **Volume 10 - 4 Issues** (February 2011 - October 2011)

▶ **Volume 9 - 4 Issues** (January 2010 - September 2010)

▶ **Volume 8 - 4 Issues** (February 2009 - September 2009)

▶ **Volume 7 - 4 Issues** (February 2008 - October 2008)

▶ **Volume 6 - 4 Issues** (March 2007 - December 2007)

# Universities' Access

- Some universities take an open approach to providing articles to the general public
  - E.g., MIT, Harvard (arts and sciences, law)
- Some academics upload their papers on their webpages

# Queen's Access

- Queen's University subscribes to journals & other electronic resources
- **On campus:** Papers & (many) full books are available on-campus
- **Off-campus:** requires use of a web proxy
  - [.proxy.queensu.ca](http://proxy.queensu.ca)
- In any case, assess the article first !

**write**  
L<sup>A</sup>T<sub>E</sub>X

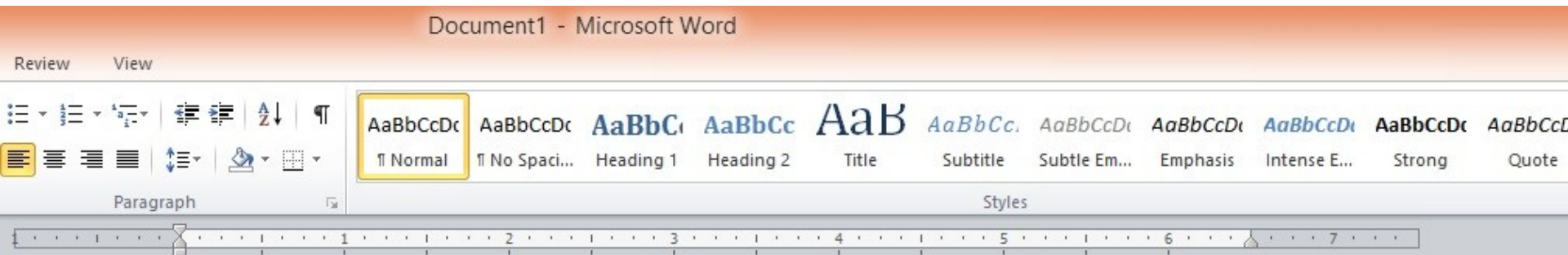
# What is Latex ?

- Word processor & document markup language.
- Different from typical word processors; it uses:
  - Plain text, i.e., not formatted
  - Markup tagging to define the structure of a document (e.g., article, book, & letter), to format text (e.g., bold/italic), & to add citations & cross-referencing.



# Microsoft Word Type Setting

- WYSIWYG



Trial

October 13, 2015

This is the main text of this file. You can make text **Bold**, *italic*, or just use the normal font.

Start a new paragraph by leaving a line. You can add an equation as follows:

.....

# Latex Type Setting

Trial

October 13, 2015

This is the main text of this file.. You can make text **Bold**, *italic*, or just use the normal font.

Start a new paragraph by leaving a line. You can add an equation as follows:

$$x = \sum_{i=0}^z 2^i Q \tag{1}$$

Refer to the equation with Eqn. 1.

# Latex Type Setting - TeX

```
\documentclass[12pt]{article}
\usepackage{amsmath}
\title{Trial}
\begin{document}
\maketitle
```

This is the main text of this file..

You can make text `\bf{Bold}`, `\emph{italic}`,  
or just use the normal font.

Start a new paragraph by leaving a line.

You can add an equation as follows:

```
\begin{equation}
\label{eqn_example}
x = \sum\limits_{i=0}^z 2^i Q
\label{eq1}
\end{equation}
```

Refer to the equation with Eqn.~`\ref{eq1}`.

```
\end{document}
```

# Why Latex? Word looks much easier



# Microsoft Word

- Useless if you are serious about text editing!
  - Difficult to specify math equations
  - References to bibliography entries
  - Figures are a huge pain
  - Does not work in combination with source control

# Latex

- Programming for professional documents
- Publish to .dvi, .ps, .pdf, and more
- Simple templating and style editing

# Latex

- TeX Distributions:
  1. MiKTeX: Windows distribution
  2. MacTeX: OSX distribution
  3. TeX Live: Linux distribution

# Latex Editor

- Notepad++
- texmaker
  - My personal favorite
- ***For any editor***, download a TeX distribution, first !



# Latex Project Structure

- *Files with your paper's main content:*
  - *Text Content:* .tex files
  - *Image Content:* Images (.pdf, .jpg, etc.)
  - *References:* .bib files
- *Styling of your paper:* .cls files (or none...)

# How to create a new Latex Project in Texmaker ...

...& add different file types to your  
project...

**DEMO !**

# Latex Styles

What if a venue specifies a format for its papers?

- 2 columns
  - Title in a specific size and centered
  - References in a specific font
- 
- Programming all these specs is hectic !

# Latex Styles

- All publication venues specify their papers' format (e.g., ACM, IEEE)
- Latex allows you to write content & the conference host to provide style
  - Content is in tex, bib, & image files
  - Style is in .cls file
- Retain content without spending time to format your paper.
  - Think CSS for PDF documents

# Latex Styles

- **Use IEEE format for position paper and proposal**

# Your Paper Title

Gehan Selim  
School of Computing  
Queen's University  
Kingston, Ontario, Canada  
Email: [gehan@cs.queensu.ca](mailto:gehan@cs.queensu.ca)

*Abstract*—Your abstract comes here.. Remember the word limit for the abstract !

## I. CONCLUSION

your conclusion text comes here

- `\documentclass{acm_proc_article-sp}`
- `\begin{document}`
- `\title{Your Paper Title}`
- `\numberofauthors{1}`
- `\author{`
- `\alignauthor`
- Gehan Selim\\
- `\affaddr{School of Computing}\\`
- `\affaddr{Queen's University}\\`
- `\affaddr{Kingston, Ontario, Canada}\\`
- `\email{gehan@cs.queensu.ca} }`
- `\maketitle`
- `\begin{abstract}`
- Your abstract comes here.. Remember the word limit for the abstract!
- `\end{abstract}`
- `\section{Conclusion}` your conclusion text comes here
- `\end{document}`



# Latex Labels

```
\section{Problem Definition}
```

```
\label{sec:prob}
```

Problem description goes here

```
\section{Solution}
```

```
\label{sec:sol}
```

The solution to the problem shown in Section `\ref{sec:prob}` is

## II. PROBLEM DEFINITION

Problem description goes here

## III. SOLUTION

The solution to the problem shown in Section II is

# Latex Figures

```
\begin{figure*}[t]  
  \centering  
  \includegraphics[scale=0.5]{imgs/frustration.jpg}  
  \caption {How to include figures in Latex.}  
  \label{fig:frust}  
\end{figure*}
```



**Fig.~\ref{fig:frust}**



Fig. 1. How to include figures in Latex.

# Latex Math Mode

For  $d_1$  and  $d_2$ , and the angle  $\theta$  between them, the cosine similarity is shown in Eqn.~\ref{eqn:cosdist}.

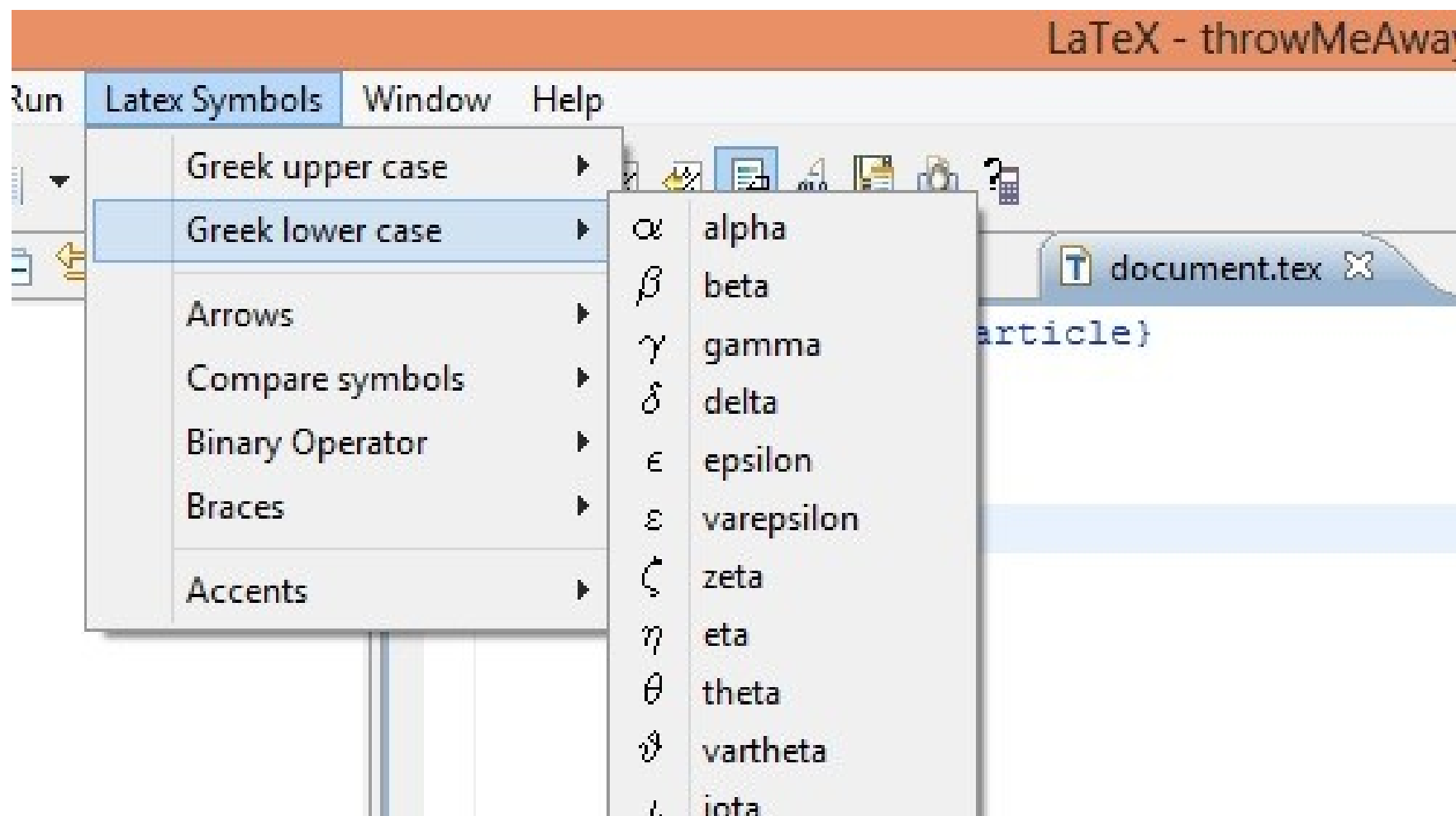
```
\begin{equation}
\cos\theta = \frac{d_1 \cdot d_2}{|d_1||d_2|}
\label{eqn:cosdist}
\end{equation}
```

For  $d_1$  and  $d_2$ , and the angle  $\theta$  between them, the cosine similarity is shown in Eqn. 1.

$$\cos \theta = \frac{d_1 \cdot d_2}{|d_1||d_2|} \quad (1)$$

# Latex Math Mode

- How do I know the available symbols ?



# Bibtex / BibTeX

- Reference management for TeX
- Simplifies citations
  - Separation of bibliography from individual document presentation

# Bibtex Sample

*Example,*



Assume you want to refer to the paper  
“Model Transformation Testing: The State of the Art”  
in your next publication... How do you do that ?

**Assume that you have:**

- **document.tex**
- **mybib.bib**

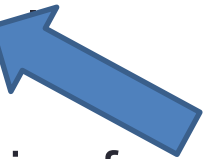
# Bibtex Sample: in *mybib.bib* file

**STEP 1:** Get the Bibtex entry ... Demo !



**Key to use in text !**

```
@inproceedings{gselim883,  
  title={{Model Transformation Testing: The State of the Art}},  
  author={Selim, Gehan M. K. and Cordy, James R and Ding  
J{"u}rgen},  
  booktitle={Proceedings of the First Workshop on the Analysis of  
Model Transformations},  
  pages={21--26},  
  year={2012},  
  organization={ACM}  
}
```



# Bibtex Sample: In *document.tex* file

## STEP 2:

```
\begin{document}
```

```
... ..
```

```
\section{Conclusion}
```

```
Here is how you refer to a paper~\cite{gselim883}.
```

```
\bibliographystyle{abbrv}
```

```
\bibliography{mybib}
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\end{document}
```



# Your Paper Title

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## ABSTRACT

Your abstract comes here.. Remember the word limit for the abstract!

## 1. CONCLUSION

Here is how you refer to a paper [1].

## 2. REFERENCES

- [1] G. M. K. Selim, J. R. Cordy, and J. Dingel. Model transformation testing: the state of the art. In *Proceedings of the First Workshop on the Analysis of Model Transformations*, pages 21–26. ACM, 2012.

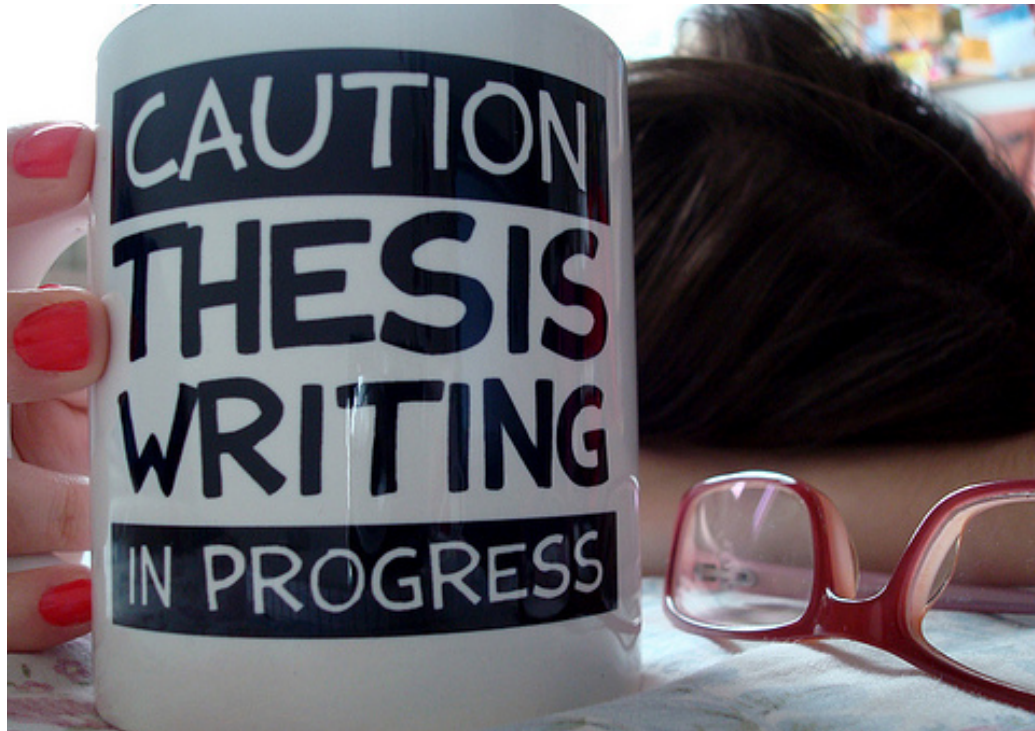
# Important Notes

- “cleaning” or “saving” the project recompiles the project & generates a new pdf file
  - Doing so when the pdf is open, will give errors.
  - Close pdf before recompilation !
- For more help on Latex:
  - Internet... millions of Latex forums !
  - Help pdf document on the IEEE/ACM links

# Remember

- ***Position Paper:***
  - IEEE style
  - Latex
  - Due Next Week
- ***Proposal***
  - IEEE style
  - Latex
  - Due Week 8, 6 November, 2:30 pm

# Tips: Thesis & Defense



Resource: “How Theses Get Written: Some Cool Tips” by  
Dr. Steve Easterbrook, University of Toronto

# Tips: Thesis & Defense

1. Writing Your Thesis

2. The Examiners' View

# What is a thesis ?

- An argument
- An exposition of an original piece of research
- Something that could be published
  - e.g. at least one paper in a scholarly journal
  - but you will probably never publish the whole thesis
- Probably the largest (most self-indulgent) piece of work you'll ever do

# What is a thesis ?

“A thesis for the PhD must form a distinctive contribution to the knowledge of the subject & afford evidence of originality shown by the discovery of new facts and/or by the exercise of independent critical power.”

(University of London regulations)

# Remember...

- Your examiners need to be told about your research
  - If it's not in your thesis, they won't find out about it
  - No matter how good your research is, you **MUST** write a good thesis
- Your examiners need to appreciate your research:
  - Choose your examiners well
  - Know their work



# How do I get started ?

- Do this today:
  - Decide your title & write your title page
  - Start a binder (or folder on your computer)
  - Look at some theses in your area
  - Plan your argument
- You can change things later
  - But you can't change it unless you have something to change!

# FORMAL VERIFICATION OF GRAPH-BASED MODEL TRANSFORMATIONS

by

GEHAN MUSTAFA KAMEL SELIM

A thesis submitted to the  
School of Computing  
in conformity with the requirements for  
the degree of Doctor of Philosophy

Queen's University  
Kingston, Ontario, Canada  
June 2015

# Plan Your Argument

One sentence for each:	Example
Introduction (area of study)	
The problem (that I tackle)	
What the literature says about this problem	
How I tackle this problem	
How I implement my solution	
The result	

**E.g., you noticed that students normally don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# For Example...

One sentence for each:	Example
Introduction (area of study)	“A Ph.D. is examined by submission of a thesis...”
The problem (that I tackle)	
What the literature says about this problem	
How I tackle this problem	
How I implement my solution	
The result	

**E.g., you noticed that students normally don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# For Example...

One sentence for each:	Example
Introduction (area of study)	"A Ph.D. is examined by submission of a thesis..."
The problem (that I tackle)	"Many students fail to complete their theses within the regulation 4 years ..."
What the literature says about this problem	
How I tackle this problem	
How I implement my solution	
The result	

**E.g., you noticed that students normally don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# For Example...

One sentence for each:	Example
Introduction (area of study)	"A Ph.D. is examined by submission of a thesis..."
The problem (that I tackle)	"Many students fail to complete their theses within the regulation 4 years ..."
What the literature says about this problem	"Empirical studies indicate that late submission is highly correlated with delaying the start of the write-up ..."
How I tackle this problem	
How I implement my solution	
The result	

**E.g., you noticed that students normally don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# For Example...

One sentence for each:	Example
Introduction (area of study)	"A Ph.D. is examined by submission of a thesis..."
The problem (that I tackle)	"Many students fail to complete their theses within the regulation 4 years ..."
What the literature says about this problem	"Empirical studies indicate that late submission is highly correlated with delaying the start of the write-up ..."
How I tackle this problem	"A model of PhD study that encourages an early start to the thesis writing task is clearly desirable ..."
How I implement my solution	
The result	

**E.g., you noticed that students don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# For Example...

One sentence for each:	Example
Introduction (area of study)	"A Ph.D. is examined by submission of a thesis..."
The problem (that I tackle)	"Many students fail to complete their theses within the regulation 4 years ..."
What the literature says about this problem	"Empirical studies indicate that late submission is highly correlated with delaying the start of the write-up ..."
How I tackle this problem	"A model of PhD study that encourages an early start to the thesis writing task is clearly desirable ..."
How I implement my solution	"Such a model encourages the student to plan a structure for the thesis & collect material for each chapter throughout their study ..."
The result	

**E.g., you noticed that students don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**



# For Example...

One sentence for each:	Example
Introduction (area of study)	"A Ph.D. is examined by submission of a thesis..."
The problem (that I tackle)	"Many students fail to complete their theses within the regulation 4 years ..."
What the literature says about this problem	"Empirical studies indicate that late submission is highly correlated with delaying the start of the write-up ..."
How I tackle this problem	"A model of PhD study that encourages an early start to the thesis writing task is clearly desirable ..."
How I implement my solution	"Such a model encourages the student to plan a structure for the thesis & collect material for each chapter throughout their study ..."
The result	"Application of this model dramatically improves submission rates."

**E.g., you noticed that students don't finish their thesis in 4 years, & you want to develop a model that increases the rate of early submission**

# Plan Your Thesis

- Convert this argument into a chapter outline
  - At least one chapter per sentence
    - or more than one for some sentences
- Start a binder with a division for each chapter
  - Collect material in this binder
  - Set out clearly what each chapter should say

# Plan Your Thesis

## Thesis Title:

“Testing & Verification of  
Model Transformations”

Estimated length (less  
references & appendices)  
140-160 pages

## Chapter Outline

1. Introduction (5-10 pages)
2. Related Work (30 pages)
3. Experimenting with Existing Tools (30-35 pages)
4. Our Proposed Tool (35 pages)
5. Evaluation (30-35 pages)
6. Conclusion & Future Work (10 pages)

# Plan Your Thesis

- Don't be afraid to change your mind
  - As you write the thesis, your ideas will evolve
  - Don't want them to stop evolving
  - It's much easier to change an outline that you've written down than one you haven't

## Thesis Title:

“Formal Verification of  
Graph-Based Model  
Transformations”

Length (with references  
& appendices)  
233 pages

## Chapter Outline

1. Introduction (6)
2. Related Work (35)
3. The GM-to-AUTOSAR Model Transformation (13)
4. Experimenting with State-of-the-Art Model Transformation Verification Tools (23)
5. The Symbolic Model Transformation Property Prover (20)
6. Evaluation of the Symbolic Model Transformation Property Prover (56)
7. Conclusion & Future Work (3)
8. Appendix A Formalizations (5)
9. Appendix B ATL Pragmatics (2)
10. Appendix C Formulated Properties (4)
11. Appendix D UMLRT-2-Kiltera Metamodels (2)

# Don't Omit Any of These ...(1)

- Title & title page - conveys a message
- Abstract – summarizes the whole thesis
- TOC - shows the right things are there
- Acknowledgements - get your supervisor on your side!
- Introduction - says “I am going to look at the following...”.
- Related Work - show you know the subject
- Show you approached the problem in a systematic way

# Don't Omit Any of These ...(2)

- **Detailed description of the work**, so that others can follow what you did
- **Critical analysis of the results (including limitations)**
- **Future Work**- show you know what's missing
- **Conclusions**- repetition of the intro, but with reference to the detail.
- **References** - Cover the field; examiners will look for the key references
- **Appendices** – Details that would clutter your eloquent description
- **Show you can pick out important ideas succinctly**

# Say Everything Thrice (1)

- In the thesis as a whole
  - What the thesis will say (Introduction)
  - Details of the work (Body)
  - What the thesis said (Conclusion)
- Within each chapter or section
  - What this section says (Signposting)
  - The details (Body)
  - What this section said (Summary)



# Say Everything Thrice (2)

- Within each paragraph
  - Each paragraph describes a single idea
  - The first sentence introduces the idea (linking it with the previous one)
  - The last sentence concludes the idea (linking it with the next one)
  - Make the first sentence the most important one
- But it's not repetition, it's linking & rationale
  - If you do it right, the reader won't notice any repetition

# Bibliography

- Keep a database of complete references
  - Use a consistent citation style
  - Use a tool (e.g., Bibtex)
  - Keep complete references
    - Page numbers, volume numbers, editors names, locations, & dates for conference proceedings

# How do I get finished ?

Answer: by not getting stuck!

You've written most of it ...  
... but for the bits you're avoiding ...  
... you keep rewriting other bits ...  
... doing more reading ...  
... tinkering with the layout ...  
... seeking awesome quotations ...

# How do I get finished ?

- Q: Why are you stuck?
- A: Because you've set yourself too hard a task
  - Don't be afraid to change your plan if it proves too hard
  - Be savage in cutting irrelevant bits
  - Learn how to notice symptoms of "being stuck," and ask for help

# Reviewing

- Get other people to read your drafts
  - Peers will give friendly comments (& may have the most time!)
  - Supervisor will steer you
  - Other academics will spot things your supervisor has missed
- Above all:
  - Get the bugs out before the examiners see it!

# Summary

- Start writing today (never tomorrow)
- Make up a title page for inspiration
- Write down your argument succinctly
- Turn the argument into a chapter plan
- Maintain a binder of stuff to put into these chapters
- Don't be afraid to change the plan

# Tips: Thesis & Defense

1. Writing Your Thesis

2. The Examiners' View

# The Examiner's View

“Uh oh, not another thesis to read...”





# The Examiner's View

- Examining theses is a chore, but:
  - “It might help me keep up to date with a research area”
  - “It might inspire me”
  - “I might learn something”
- Note: the reading will be done in trains, planes, & departmental meetings!

# Examiner's First Question

What's this one about?

Examiners have little time available, so they want to extract the most content in the shortest time

# Typical scanning order of a new thesis

Abstract  Bibliography  Conclusions  TOC

- This may be enough to decide whether it's worth a PhD.
- Then:
  - What questions now spring to mind? ... read ...
  - Were the questions answered?

# Published Already?

- Peer-review publications are crucial
  - The research community's most important validation criteria
- Sure-fire recipe for success:
  - Identify the top peer-reviewed conferences & journals in your area
  - Publish your research at them
  - Always take the reviewers comments seriously
- If you've published in the right places
  - You have nothing more to worry about
  - Your examiners can't ignore the result of the peer-review process

# Corrections

- Some examiners don't feel they've done the job unless they find some corrections to do
- Typical corrections:
  - Grammatical errors
  - Poor presentation
  - Missing or redundant statements/references
  - Missing pieces of work (sections, experiments)

# Thesis Defense

- Read your thesis beforehand...a lot !
- The examiners will have decided before the exam whether the thesis will pass
- The exam is to check it's your work ...
  - Talk fluently about the work, show you've thought about it (which you have!)
- A chance to clarify things that aren't clear in the thesis
  - These are areas where corrections are likely