Lecture 3

Literature Reviews

UNIVERSITY OF AUCKLAND
COMPSIC 705 / SOFTENG 702
Prof. Robert Amor
Learning Objectives

- Understand what exists in a literature review
- To understand quality indicators for literature
- Know what types of information to identify in a paper
- To know what types of literature exist
- To be able to find literature
- Learn an approach to reading research literature
  - Know what should be understood at each pass
- Learn to quote and reference correctly
- Learn approaches to effective presentations
Literature Review

- An account of what has been published on your topic of interest
- Purpose – to critically analyze a segment of a published body of knowledge through summary, classification, and comparison of prior studies
- Traditional
  - Identifies and summarises a body of work
  - Identifies gaps and research frontier
  - Coverage may not be complete
- SLR – Systematic Literature Review
  - Rigorous process to identify ‘all’ relevant literature
  - Identifies and summarises a body of work
  - Identifies gaps and research frontier
The Format of a Literature Review

- Introduction
  - Why you are writing a review, why the topic is important, where does it fit in CS
  - The scope of the review — what will the discussion include and exclude
  - The organisational pattern of the review

Today, most people spend a large portion of their time living and working in buildings. However, natural or man-made hazards can make the building environment dangerous for staying. Proper evacuation responses and behavior during an emergency is a crucial factor to increase survival chance. In general, people are trained and acquire evacuation knowledge (e.g., emergency response, self-protection skills, best practice) through traditional approaches such as videos, posters, seminars, courses, or evacuation drills. However, these traditional approaches may not effectively transmit knowledge (Gwynne, Boyce, Kuligowski, Nilsson, Robbins, & Lovegrove, 2016). One reason is that after an evacuation drill, building occupants are generally not provided with individual feedback assessing their evacuation behavior (Gwynne, Kuligowski, Boyce, Nilsson, Robbins, & Lovegrove et al., 2017). Another reason is that building occupants can be not emotionally engaged in the learning process that may lead to a reduced effect on attitude and limited change in behavior (Chittaro, Battus, & Zangrando, 2014). In fact, Yang, Wu, and Li (2011) pointed out that real-life evacuation behavior is different from experiments such as evacuation drills, which means that current evacuation models still have
The Format of a Literature Review

- **Body**
  - Headings and subheadings
  - Summarize and evaluate the current state of knowledge
  - Note major themes or topics, the most important trends, and any findings about which researchers agree or disagree
  - Its purpose is to make an argument that will justify your proposed conclusions
The Format of a Literature Review

- **Conclusion**
  - A summary of the main agreements and disagreements in the literature
  - The general conclusions that are being drawn
  - Highlight gaps and indicate how previous research leads to your own conclusions

We carried out a systematic literature review on PVR SGs for evacuation training and research. The pedagogical and behavioural outcomes, gaming environment development, and outcomes and participation experience measures were extensively explored. The findings indicate the advantages and disadvantages of PVR SGs in terms of delivering evacuation knowledge and conducting evacuation behavior analyses. This study provides insights into the characteristics and structure of PVR SGs. As a result, we proposed a conceptual framework for developing and implementing successful PVR SGs for evacuation training and research. Furthermore, the conceptual framework is derived from systematic literature review findings. Regarding this, this framework must be further studied and validated.

When conducting this study, we found some potential directions for future research. As we stated before, there is still need to investigate the impact of different navigation solutions on motion sickness. Apart from that, within the 15 reviewed papers, eleven focused on fire evacuation, three focused on aviation and spacecraft evacuation, while only one refers to evacuation during earthquakes. There seems to be a significant gap between the research on fire evacuation and research on earthquake evacuation, with little attention given to the latter. Regarding that, more attention needs to be paid on earthquake safety training (Lurynghi et al., 2017). Another interesting finding is that only one study took children as research subjects (Smith & Eison, 2009). The rest of the researches were carried out in universities, with students and staff comprising the majority of the subjects. During an emergency, children are more vulnerable than adults. Therefore, it would be valuable to conduct more research on children using an IVR SG approach.
Writing the Literature Review

- Organise the section structure first
- Be selective
- Use quotes sparingly
- Summarise and synthesize
- Keep your own voice
- Use caution when paraphrasing (remember to cite)
- Focus on analysis, not description
- Revise, revise, revise
Immersive virtual reality serious games for evacuation training and research: A systematic literature review

Zhenan Feng\textsuperscript{a,}\textsuperscript{*,} Vicente A. González\textsuperscript{b}, Robert Amor\textsuperscript{b}, Ruggiero Lovreglio\textsuperscript{b}, Guillermo Cabrera-Guerrero\textsuperscript{d}

\textsuperscript{a}Department of Civil and Environmental Engineering, The University of Auckland, New Zealand
\textsuperscript{b}Department of Computer Science, The University of Auckland, New Zealand
\textsuperscript{c}School of Engineering and Advanced Technology, Massey University, New Zealand
\textsuperscript{d}Escuela de Ingeniería Informática, Pontificia Universidad Católica de Valparaíso, Chile

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\textbf{ABSTRACT}

An appropriate and safe behavior for exiting a facility is key to reducing injuries and increasing survival when facing an emergency evacuation in a building. Knowledge on the best evacuation practice is commonly delivered by traditional training approaches such as videos, posters, or evacuation drills, but they may become ineffective in terms of knowledge acquisition and retention. Serious games (SGs) are an innovative approach devoted to training and educating people in a gaming environment. Recently, increasing attention has been paid to immersive virtual reality (IVR)-based SGs for evacuation knowledge delivery and behavior assessment because they are highly engaging and promote greater cognitive learning.

This paper aims to understand the development and implementation of IVR SGs in the context of building evacuation training and research, applied to various indoor emergencies such as fire and earthquake. Thus, a conceptual framework for effective design and implementation through the systematic literature review method was developed. As a result, this framework integrates critical aspects and provides connections between them, including pedagogical and behavioral impacts, gaming environment development, and outcome and participation experience measures.

1. Introduction

Today, most people spend a large portion of their time living and working in buildings. However, natural or man-made hazards can make the building environment dangerous for staying. Proper evacuation responses and behavior during an emergency is a crucial factor to increase survival chance. In general, people are trained and acquire evacuation knowledge (e.g., emergency response, self-protection skills, best practice) through traditional approaches such as videos, posters, seminars, courses, or evacuation drills. However, these traditional approaches may not effectively transmit knowledge (Gwynne, Boyce, Kuligowski, Nilsson, P,
Finding Literature
How do you find information?

- What do you do currently?
  - Why is this good?
  - Why is this bad?

- Motivation
  - Standing on the shoulders of giants
    - Understanding where the forefront of research is
    - Research something new
    - Don’t reinvent the wheel
    - Learn about dead-ends
# Quality Obsession

“No one knows how many scientific journals there are, but several estimates point to around 30,000, with close to two million articles published each year.” (Altbach and de Wit 2018)

- So how do we know what is worth reading?
  - Quality Publication Aggregators
  - Peer Review
  - Citations
  - Knowledge of Journal or Publisher
  - Knowledge of Institution
  - Knowledge of Author
Helpful Resources

- Quality Publication Aggregators – and others
  - Scopus, Science Direct (Elsevier)
  - Springer Link
  - IEEExplore
  - ACM Digital Library
  - Web of Science
  - Google Scholar
  - Author homepages
  - Research groups
  - Relevant conferences/journals
# Library Resources

- Physical books and journal stacks
- Online databases
  - 100’s available at UoA library
- Librarian
## Internet Resources

- **Google Scholar**
  - Wide coverage over conferences and journals
  - Access to PDF for many articles
  - Link to publisher’s publication URL (DOI)
  - Citation information
  - Known author profiles

But

- Quality not guaranteed
- Self-citations
John Hosking
Dean of Science, University of Auckland
Verified email at auckland.ac.nz - Homepage
Software Engineering, Software Tools, Visual Languages

**TITLE** | **CITED BY** | **YEAR**
--- | --- | ---
Inconsistency management for multiple-view software development environments | 228 | 1998
J. Grundy, J. Hosking, W.B. Mugridge
IEEE Transactions on Software Engineering 24 (11), 960-961

Design pattern modelling and instantiation using DPML | 174 | 2002
D. Magoulas, J. Hosking, J. Grundy
Proceedings of the Fourth International Conference on Tools for Practical Software Engineering...

A generic approach to supporting diagram differencing and merging for collaborative design | 156 | 2005
A. Mahra, J. Grundy, J. Hosking
Proceedings of the 20th IEEE/ACM International Conference on Automated Software Engineering...

Realistic load testing of web applications | 110 | 2006
D. Drakakis, J. Grundy, J. Hosking, C. Lutteroth, G. Weber
Conference on Software Maintenance and Reengineering (CSMR'06), pp. 113-120

Realistic Load Testing of Web Applications | | 2006
C. Lutteroth, G. Weber, D. Drakakis, J. Hosking, J. Grundy
Conference on Software Maintenance and Reengineering (CSMR'06), 57-70

An e-whiteboard application to support early design-stage sketching of UML diagrams | 107 | 2003
Q. Chen, J. Grundy, J. Hosking
IEEE Symposium on Human Centric Computing Languages and Environments, 2003...

Multi-methods in a statically-typed programming language | 107 | 1991
W.B. Mugridge, J. Hamer, J.G. Hosking
European Conference on Object-Oriented Programming, 307-324

Pounamu: A meta-tool for multi-view visual language environment construction | 89 | 2004
N. Zhao, J. Grundy, J. Hosking
Visual Languages and Human-Centric Computing, 2004 IEEE Symposium on, 254-256

Serendipity: integrated environment support for process modelling, enactment and work coordination | 89 | 1998
J.G. Grundy, J.G. Hosking
Automated Software Engineering 5 (1), 7-40

Information visualisation utilising 3D computer game engines case study: a source code comprehension tool | 80 | 2005
B. Kit, B. Wierschke, J. Grundy, J. Hosking
Proceedings of the 6th ACM SIGCHI New Zealand chapter's international conference...

Constructing component-based software engineering environments: issues and experiences | 79 | 2006

Types of Publication

- Book
- Book chapter
- Conference article
- Internet site
  - Wikipedia
- Journal article
- Magazine article (trade or popular journal)
- Patent
- Standard
- Technical report
- Thesis/Dissertation
- White paper
- ...

Literature Reviews
Scope of search

- To develop/refine your research question
- Define the limits of the review
  - Too broad: Human-Computer Interaction
  - Too narrow: How does Human-Computer Interaction impact productivity of construction professionals with tablets on site?
  - Just right: Human-Computer Interaction and “construction professionals”
Ranking of Journals and Conferences

- ERA (Excellence in Research for Australia)
  - Community ranked thousands of journals and conferences
  - A*, A, B, C

- Web of Science
  - Impact Factor
  - Rank in Category

![IEEE Transactions on Pattern Analysis and Machine Intelligence](image)
Paper Citations

- A proxy for quality?
  - Self citations not always disambiguated
  - Web of Science
Reference Chains

- Found a great article
  - What research does it cite?
  - What does it cite to support particular claims in the paper?
  - What related work does it cite?
ture and interaction mechanism based on the construction problems such that if agents follow this, the overall system will solve the particular problem. The design of agent-based systems for construction problems have all the problems associated with designing traditional distributed, concurrent systems and have additional difficulties that arise from having flexible and sophisticated interactions between autonomous problem-solving components. The great power and flexibility of MAS allows developers to tailor the system to various construction problems as long as a properly designed architecture and collaboration mechanism could be built. Besides the collaboration mechanism, the integration of engineering domain knowledge is another important concern of the construction agent research community. For example, the development of domain knowledge-based ontology, integration with existing legacy systems, and the implementation of conceptual models with available agent building toolkits are all difficult tasks in the development of MAS in construction.

Considering the complexity and dynamics of construction problems, there are many other important issues to be addressed for the effective application of agent-based systems. One particularly important aspect is the development of agent's learning and adaptive ability in construction applications. Change management is always a top concern for project managers, either during the project planning, collaborative design, resource management or execution processes. System developers are unable to foresee all potential situations an agent could encounter and specify agent behaviour optimally in advance. The agent's ability to learn from each other and the external environment provide a unique and powerful tool to tackle the changing environment. However, since the study of MAS in construction is relatively

References

[13] J. Heckel, K.D. Ingram, J.D. Morton, P. Lawrence, The agent collaboration environment, an assistant for architects and engi-
Researchers and Research Groups

- Typically researchers work on a topic for many years
- Look at their bibliography
  - Google Scholar
  - Personal websites
- Researchers often part of a larger research group
  - Search for the group website
Human-Computer Interaction at MIT CSAIL

Faculty & PIs

Randall Davis
Design Rationale Group

Max Goldman
Usable Programming Group

D. Fox Harrell
Imagination, Computation, and Expression Lab

Daniel Jackson
Software Design Group
Reading Literature
Approaching an Article

- Do you read a paper from front to back?

- We’ll look at the following approach:
A Three-Pass Approach (Keshav 2007)

1. A quick scan
   - Title, abstract and (perhaps) introduction
   - Section headings
   - Conclusions
   - Decide if you need to continue reading the paper

   - Can you answer the following:
     - Category – the type of paper
     - Context – papers it is related to, how was problem analysed
     - Correctness – do they have valid assumptions
     - Contributions – what are its main claims
     - Clarity – is it well put together
A Three-Pass Approach (Keshav 2007)

2. Reading majority of content
   - Ignore technical detail such as proofs
   - Examine figures and tables
   - Make comments, note key points
   - Note useful references
   - Decide if you need to continue reading the paper

3. Fully read the paper
   - Understand it enough you could re-implement the research
   - What future work could there be?
Markup and Quotes

- Underline and highlight points as you go
- Take notes
- Annotate article with queries, points you want to ensure are addressed
- Major claims stated by the authors, might make nice quotes for your summary
  - Though in most cases you’d paraphrase
<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>What are the publication details?</td>
</tr>
<tr>
<td>2.</td>
<td>What is a 1 sentence description of the paper?</td>
</tr>
<tr>
<td>3.</td>
<td>What are the important concepts and ideas?</td>
</tr>
<tr>
<td>4.</td>
<td>Are there other concepts you need to understand?</td>
</tr>
<tr>
<td>5.</td>
<td>What are the claimed contributions?</td>
</tr>
<tr>
<td>6.</td>
<td>How well is each claimed contribution supported?</td>
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<tr>
<td>7.</td>
<td>What assumptions are made in respect to claims?</td>
</tr>
<tr>
<td>8.</td>
<td>What are the threats to validity?</td>
</tr>
<tr>
<td>9.</td>
<td>What future work might be based on the paper?</td>
</tr>
<tr>
<td>10.</td>
<td>What important references should be followed up?</td>
</tr>
<tr>
<td>11.</td>
<td>Are there other references that might be interesting?</td>
</tr>
<tr>
<td>12.</td>
<td>Is there anything else of interest in the paper?</td>
</tr>
<tr>
<td>13.</td>
<td>What other thoughts are sparked by the paper?</td>
</tr>
<tr>
<td>14.</td>
<td>How is this paper relevant?</td>
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</tbody>
</table>
Plagiarism

- Using the work of others without explicit acknowledgement and referencing, that is, plagiarism. It includes: use of other people's data without acknowledgement; use of published or unpublished expressions and ideas from other people without adequate attribution; use of published or unpublished charts, diagrams. (Student Academic Conduct Statute, UoA)
- Plagiarism is the representation of another author's language, thoughts, ideas, or expressions as one's own original work (Wikipedia)
Avoid Plagiarism

- Always acknowledge the sources
- Present as quotes – Gallimore (1994) suggests that “valuers tend to give greatest weight to more recent information....” (p. 25).
- References included for:
  - Tables
  - Figures
  - Graphs or diagrams
- Self-plagiarism
Avoid Plagiarism

- Minimise what is quoted from other sources
  - 1-2 sentences
  - Almost never a paragraph
  - Many quotes strung together is not your writing
- Paraphrase
  - Really needs to be in your own words
- Plagiarism detection systems, UoA subscribes to:
Example Approaches

![Diagram: Modified Leavitt's Diamond Theory of Technology Impact](https://libraryguides.vu.edu.au/ieeereferencing)

**Figure 1: Modified Leavitt’s diamond theory of technology impact [6]**

Examples of a short direct quote:

Baez et al. have noted that “full 3D stacking can potentially offer additional advantages for memory and processor applications” [7, p. 14].

In fact, Wilde et al. [3, p. 21] suggest that energy storage is achieved “by means of static charge rather than of an electro-chemical process inherent to the battery”.

If you need to leave some unnecessary words out of the quotation, use a set of dots (...), called an ellipsis, indicating a break in quotes.

As seen in [5, p. 14], “the proposed circuit has improved signal attenuation ... and has been experiencing less performance degradation due to resistor variation”.

### TurnItIn Example

| Tutorial 2 Heuristic evaluation 2020 doc... | 60% | ✔️ | ✗ | 1277270923 | 18-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 60% | ✔️ | ✗ | 1276565999 | 20-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 61% | ✔️ | ✗ | 1278467917 | 20-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 61% | ✔️ | ✗ | 127934917 | 22-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 62% | ✔️ | ✗ | 1278047324 | 19-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 62% | ✔️ | ✗ | 1277752905 | 19-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 62% | ✔️ | ✗ | 1278047981 | 19-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 63% | ✔️ | ✗ | 1276508450 | 20-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 63% | ✔️ | ✗ | 1278693658 | 20-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 63% | ✔️ | ✗ | 1278074786 | 19-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 64% | ✔️ | ✗ | 1279155429 | 21-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 64% | ✔️ | ✗ | 1277838965 | 19-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 65% | ✔️ | ✗ | 1276586431 | 20-Mar-2020 |
| Tutorial 2 Heuristic evaluation 2020 doc... | 66% | ✔️ | ✗ | 1277985246 | 19-Mar-2020 |

**7. Flexibility and Efficiency of Use**
- No way to easily re-book: low, MyPC
  - Remember past bookings to book certain lengths or desks again later

**8. Aesthetic and Minimalist Design**
- The _default site is meaningless and confuses new users: moderate, MyPC
  - Remove the _default site or make Kate Edgar the initial site

**9. Help Users to Recognise, Diagnose, and Recover from Errors**
- When the issue “advanced bookings is not allowed” there is not information on how to properly select a booking: moderate, MyPC
  - Add more information in the error report to tell the user what to do.

**10. Help and Documentation**
- “Booking Instructions” does not teach you how to book: High, Main page
  - Change the name or the information provided in that area to something more relevant.

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**Literature Reviews**

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Presentation Skills
How to deliver effective presentations

- Know your audience and their background
- Research thoroughly
- Document your sources
- Write your speech
- Prepare the slideshow

http://sustainability.psu.edu/student-groups
Prepare the slideshow

- What are the points you want to get across?
- Slides are a visual aid
  - Pictures are good (oops...)
- Don’t put too much on a slide
- Not too much flashy graphics/Animations
- Time your presentation
- References at end
- Extra material after the end
- Choose an appropriate style
How to deliver effective presentations

- Rehearse and have a dress rehearsal
- Modify based on rehearsals
- Prepare yourself
- Style on stage
- Present to the audience
- Answer questions

Common mistakes I’ve seen

- Too much text on a slide
- Reading all the text on the slide
- Text on slides too small (>= 24pt)
- Facing the screen rather than audience
- Too many slides (7-8 for 10 mins?)
- Interlocutory sounds
- Failed movies and live demonstrations
Asking Questions?

- You can always ask a question!
  - It’s what science and engineering is all about...

- Reflecting on what is being presented
  - Does it match what you know/believe?

- Why do we ask questions?
  - Clarify your understanding
  - To address contradictions
  - To highlight an aspect of the research
  - To gain further insight from experts
  - To propose future directions
  - To relate to other research you are aware of
  - To be known 😊
Asking Questions?

- Just ask one question
  - Wait for the chair or speaker to acknowledge you
  - Prepare - jot down what it is you want to ask about
  - Provide some context
    - On slide X
    - When you were talking about Y
  - Don’t make it about you!
- Closed questions
- Open questions
Answering Questions

- Stay calm!
- Think about possible questions prior to the presentation
- Ensure you understand the question
  - Ask for clarification or rephrasing if you don’t
- Take a few seconds to think about your answer
- Repeat your understanding of the question
- Give a short answer (yes/no) before a detailed explanation
- If you don’t know then say so – don’t make it up
  - You could offer an opinion
- If it is a misunderstanding of your presentation, then make that clear and try to rephrase
- If very detailed, or long to answer, suggest talking later
Summary

- Standard requirements for literature reviews
  - Not just summarizing papers
- An overwhelming amount of literature available
  - Need strategies to search for relevant information
    - Repositories versus Internet search
    - Keywords and constraining search criteria
    - Following references, researchers and groups
  - Need to be able to identify quality of information
    - Publication venue
    - Review process
    - Citations
Summary

- A three pass approach allows decisions on applicability to be made without investing too much time
- Simple requirements for quoting text and figures
- Presentations require structure and rehearsal
- Slides are a prop, minimize what goes on them
- Asking questions is a core skill of a scientist and engineer
Sources