



IA377

IA377 - FEEC/Unicamp Seminar in Computer Engineering

Prof. Christian Rothenberg (DCA/FEEC/UNICAMP)
chesteve@unicamp.br

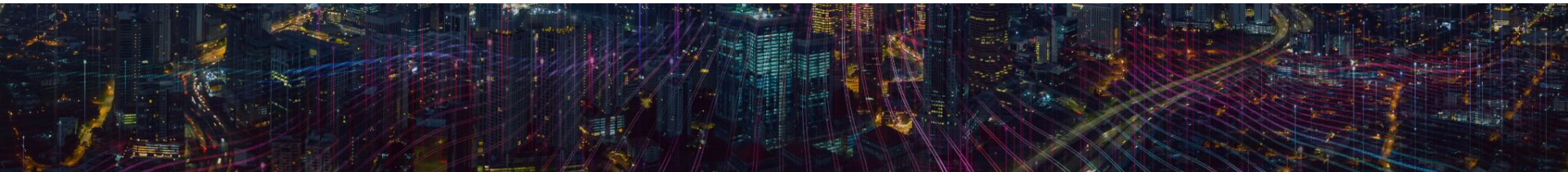




IA377

Literature Review

March-09, 2023



Agenda

Administrative

Literature Review

- What is a literature review?
- Methodology, best practices, tips, tools, etc.
- Practical example
- “Literature Review” in IA377 seminar activities.

Final Class projects

Administrative

- New Students & “Class organization review”
- Verify access to Classroom
- Sign Class Mailing List
- Add the seminar schedule to your Google Calendar or iCal application
- Schedule

Further contributions to IA377

- Help with Dissemination
 - Oral, social media (Youtube, LinkedIn, etc.), etc.
- Sponsors for Coffee or Lunch?
- Any other ideas to boost this new class towards a series of distinguished lectures?

Schedule



Schedule (Tentative)

<https://ia377-feec-unicamp.github.io/schedule/>

Classes

Literature Review: Methodology and Best Practices - 09 March 2023 - Prof. Christian Rothenberg

Welcome to IA377 - 02 March 2023 - Prof. Christian Rothenberg

Seminars

Hot Topics in Computer Networking - 16 March 2023 - Prof. Christian Rothenberg

Calendar

Add the seminar schedule to your [Google Calendar](#) or [iCal](#) application.

IA377: FEEC/Unicamp Seminar in Computer Engineering

Today		March 2023				Print	Week	Month	Agenda
Mon	Tue	Wed	Thu	Fri	Sat	Sun			
27	28	Mar 1	2	3	4	5			
			13:00 Welcome Clast						
6	7	8	9	10	11	12			
			13:00 Literature Rev						
13	14	15	16	17	18	19			
			13:00 Seminar: Hot						
20	21	22	23	24	25	26			
			13:00 IA377 - FEEC/						
27	28	29	30	31	Apr 1	2			
			13:00 IA377 - FEEC/						

Literature Review: Main Steps (Source: ChatGPT)

- 1. Define your research question or topic:** Before starting your literature review, you need to have a clear understanding of your research question or topic. This will help you to focus your search and identify relevant studies.
- 2. Conduct a comprehensive search:** Use appropriate databases, search engines, and other resources to find relevant studies. You may also want to consult reference lists, bibliographies, and citation indexes to identify additional studies.
- 3. Evaluate the quality of the studies:** Once you have identified relevant studies, you need to evaluate their quality. This involves assessing their methodology, sample size, data analysis, and other factors that may affect the validity and reliability of their findings.
- 4. Synthesize the findings:** After evaluating the studies, you need to synthesize their findings. This involves identifying patterns, trends, and themes in the literature and summarizing the key findings.
- 5. Analyze and interpret the findings:** Once you have synthesized the literature, you need to analyze and interpret the findings. This involves identifying gaps in the literature, inconsistencies, and areas for future research.
- 6. Write your literature review:** Finally, you need to write your literature review. This should be structured and organized in a logical and coherent way, with a clear introduction, body, and conclusion.

Literature Review: Main Steps (Source: ChatGPT)



Which are the main steps of literature review



The main steps of a literature review typically include:

1. Define your research question or topic: Before starting your literature review, you need to have a clear understanding of your research question or topic. This will help you to focus your search and identify relevant studies.
2. Conduct a comprehensive search: Use appropriate databases, search engines, and other resources to find relevant studies. You may also want to consult reference lists, bibliographies, and citation indexes to identify additional studies.
3. Evaluate the quality of the studies: Once you have identified relevant studies, you need to evaluate their quality. This involves assessing their methodology, sample size, data analysis, and other factors that may affect the validity and reliability of their findings.
4. Synthesize the findings: After evaluating the studies, you need to synthesize their findings. This involves identifying patterns, trends, and themes in the literature and summarizing the key findings.
5. Analyze and interpret the findings: Once you have synthesized the literature, you need to analyze and interpret the findings. This involves identifying gaps in the literature, inconsistencies, and areas for future research.
6. Write your literature review: Finally, you need to write your literature review. This should be structured and organized in a logical and coherent way, with a clear introduction, body, and conclusion.

Literature Review: Good practices (1/2)

> List good practices and useful online tools to do an effective literature review of a certain research topic

Good practices for an effective literature review include:

- 1. Develop a clear research question or topic:** Before starting your literature review, it is important to have a clear research question or topic in mind. This will help you to focus your search and identify relevant studies.
- 2. Use multiple databases:** Use multiple databases to ensure that you are identifying all relevant studies. Popular databases for academic research include PubMed, Web of Science, and Google Scholar.
- 3. Use search terms and keywords:** Use relevant search terms and keywords to help you find studies that are relevant to your topic.

Literature Review: Good practices (2/2)

> List good practices and useful online tools to do an effective literature review of a certain research topic

4. Evaluate the quality of the studies: It is important to evaluate the quality of the studies you identify. Look for studies with a clear methodology and a large sample size, and check that the study design is appropriate for your research question.

5. Keep track of your sources: Keep track of the sources you use in your literature review, including the author, title, publication date, and other relevant information.

6. Use a citation manager: A citation manager such as Zotero or EndNote can help you to keep track of your sources and organize your literature review.

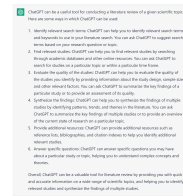
7. Summarize and synthesize the findings: Once you have identified relevant studies, it is important to summarize and synthesize the findings. Look for patterns, trends, and themes in the literature.

8. Be systematic: Be systematic in your approach to the literature review, and follow a clear and structured process

Literature Review: ChatGPT as a Tool (1/2)

> How could ChatGPT be used for literature review of a given scientific topic.?

- 1. Identify relevant search terms:** ChatGPT can help you to identify relevant search terms and keywords to use in your literature search. You can ask ChatGPT to suggest search terms based on your research question or topic.
- 2. Find relevant studies:** ChatGPT can help you to find relevant studies by searching through academic databases and other online resources. You can ask ChatGPT to search for studies on a particular topic or within a particular time frame.
- 3. Evaluate the quality of the studies:** ChatGPT can help you to evaluate the quality of the studies you identify by providing information about the study design, sample size, and other relevant factors. You can ask ChatGPT to summarize the key findings of a particular study or to provide an assessment of its quality.



Literature Review: ChatGPT as a Tool (2/2)



> How could ChatGPT be used for literature review of a given scientific topic.?

4. Synthesize the findings: ChatGPT can help you to synthesize the findings of multiple studies by identifying patterns, trends, and themes in the literature. You can ask ChatGPT to summarize the key findings of multiple studies or to provide an overview of the current state of research on a particular topic.

5. Provide additional resources: ChatGPT can provide additional resources such as reference lists, bibliographies, and citation indexes to help you identify additional relevant studies.

6. Answer specific questions: ChatGPT can answer specific questions you may have about a particular study or topic, helping you to understand complex concepts and theories.

Overall, ChatGPT can be a valuable tool for literature review by providing you with quick and accurate information on a wide range of scientific topics, and helping you to identify relevant studies and synthesize the findings of multiple studies.

Literature Review

Practical example 1: ChatGPT

Practical example 2: Google Scholar

Literature Review: Example with ChatGPT (1/2)

I am doing a literature review on Software Defined Networking or SDN. Find the five most relevant studies related to Software Defined Networking. List the five most cited publications on Software Defined Networking.



Here are five relevant studies related to Software Defined Networking (SDN):

1. "Software-defined networking: A comprehensive survey" by M. S. Al-Fares, A. Loukissas, and A. Vahdat, published in Proceedings of the IEEE Conference on Communications and Network Security in 2016.
2. "Software-defined networking (SDN): A survey" by S. J. Benzekki, A. Taleb, and N. K. Sharma, published in Computer Networks in 2017.
3. "Software-defined networking (SDN) and network function virtualization (NFV) integration: Challenges, opportunities, and unresolved issues" by A. F. Santos, R. J. M. Vidal, and A. J. M. Castro, published in Journal of Network and Computer Applications in 2019.
4. "Software-defined networking (SDN) and openflow for beginners" by T. A. Alashaikh, published in Journal of King Saud University - Computer and Information Sciences in 2018.
5. "Software-defined networking (SDN): A review of security concerns and challenges" by N. K. Sharma, S. J. Benzekki, and A. Taleb, published in IEEE Access in 2018.

Here are the five most cited publications on Software Defined Networking (SDN) according to Google Scholar:

1. "Software-defined networking: A comprehensive survey" by M. S. Al-Fares, A. Loukissas, and A. Vahdat, published in Proceedings of the IEEE Conference on Communications and Network Security in 2016.
2. "Openflow: enabling innovation in campus networks" by N. McKeown, T. Anderson, H. Balakrishnan, G. Parulkar, L. Peterson, J. Rexford, S. Shenker, and J. Turner, published in ACM SIGCOMM Computer Communication Review in 2008.
3. "The future of networking, and the past of protocols" by N. McKeown, published in Keynote Speech at the Open Networking Summit in 2011.
4. "Software-defined networking (SDN): A survey" by S. J. Benzekki, A. Taleb, and N. K. Sharma, published in Computer Networks in 2017.
5. "A survey of software-defined networking: Past, present, and future of programmable networks" by D. Kreutz, F. M. V. Ramos, P. E. Veríssimo, C. E. Rothenberg, S.

Literature Review: Example with ChatGPT (2/2)

The answer point to the publication "Software-defined networking: A comprehensive survey" is not correct. It was not written by the authors and not published in the proceedings. The correct citation is: Diego Kreutz, Fernando M. V. Ramos, Paulo Verissimo, Christian Esteve Rothenberg, Siamak Azodolmolky, Steve Uhlig. "Software-Defined Networking: A Comprehensive Survey." In Proceedings of the IEEE, Vol. 103, Issue 1, Jan. 2015.



I apologize for the mistake in my previous answer. You are correct that the publication "Software-Defined Networking: A Comprehensive Survey" was written by Diego Kreutz, Fernando M. V. Ramos, Paulo Verissimo, Christian Esteve Rothenberg, Siamak Azodolmolky, and Steve Uhlig, and was published in Proceedings of the IEEE, Vol. 103, Issue 1, in January 2015. Thank you for pointing out the error.

Literature Review: Example with Google Scholar

Google Scholar

Literature Review

“Literature Review” in IA377 seminar activities.

1. Define your research question or topic: Before starting your literature review, you need to have a clear understanding of your research question or topic.

Use the seminar title and abstract to specify a research question or topic definition for the target seminar.

2. Conduct a comprehensive search: Use appropriate **databases, search engines, and other resources** to find relevant studies. You may also want to consult reference lists, bibliographies, and citation indexes to identify additional studies.

Describe how you found candidate studies (e.g., ChatGPT, google, IEEE Xplore, ask Prof. X, etc.)

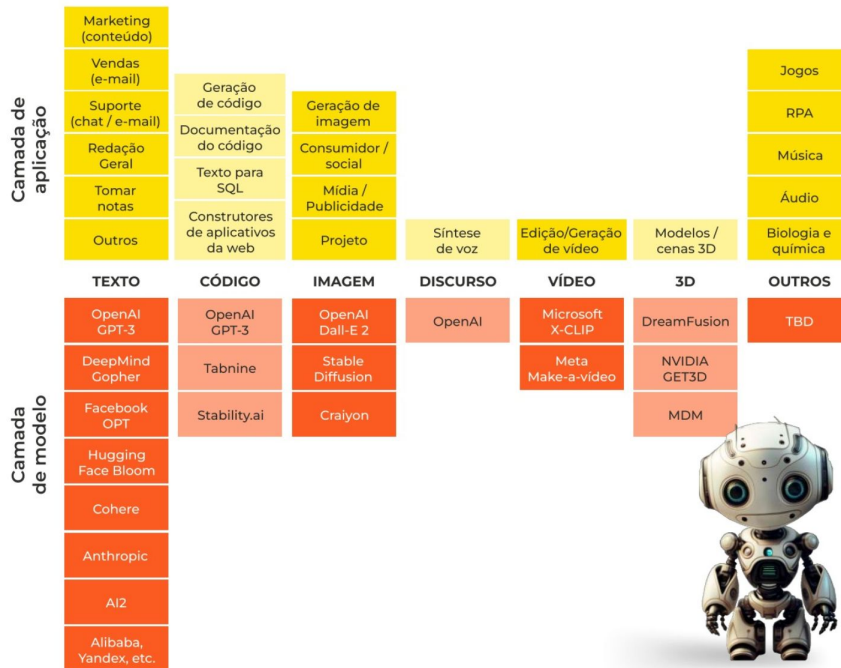
3. Evaluate the quality of the studies: Once you have identified relevant studies, you need to evaluate their quality. This involves assessing their methodology, sample size, data analysis, and other factors that may affect the validity and reliability of their findings.

Select the “top 5” must read / most relevant studies of the given topic. Describe the criteria / approach used.

Final Class Project

Application of one seminar theme in one (ore more) generative AI tool(s) of your choice

- <https://join.bluewillow.ai/>
- <https://app.wand.ai/>
- <https://www.gptforslides.app/>
- <https://www.rezi.ai>
- <https://www.compose.ai/>
- <https://glasp.co/>
- <https://www.cogram.com/>
- <https://excelformulabot.com/>
- <https://www.slidesai.io/>
- <https://quillbot.com/>
- <https://www.akkio.com/>
- <https://openai.com/blog/chatgpt>
- more?

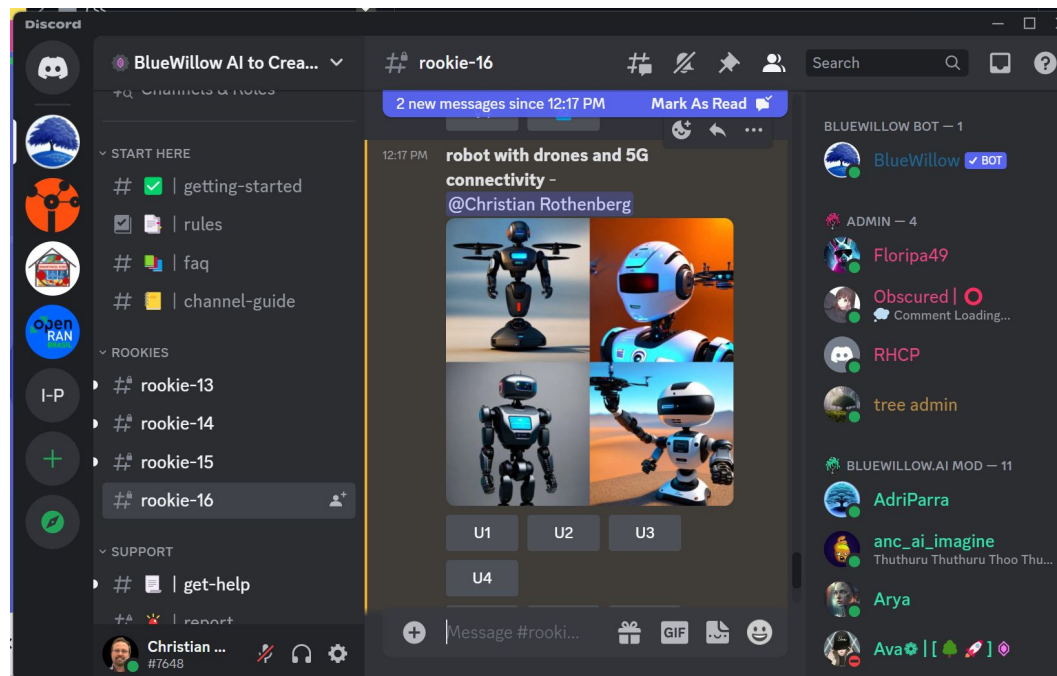


Fonte: Sequoia | "The Generative AI Application Landscape" | Elaboração @snaq.co

Final Class Project

Application of one seminar theme in one (ore more) generative AI tool(s) of your choice

• <https://join.bluewillow.ai/>



Final Class Project

- <https://join.bluewillow.ai/>

12:19 PM

**robot with drones and 5G
connectivity -**

@Christian Rothenberg



Final Class Project

ChatGPT

<https://openai.com/blog/chatgpt>

- > Write a story about X, Y, Z ?
- > Discuss X, Y, Z ?
- > Compare X, Y, Z ?



BACKUP

This section provides an exhaustive description of our methodology, which is outlined in Figure 3. We provide a selection process of current research work to study a large part of the most relevant literature on virtual resource placement. We select the papers based on keywords, publisher, and abstract reading.

1) *Keywords search*: The selection process of relevant articles started with a search of research articles from Google Scholar database [scholar.google.com] with at least one of the following selected keywords in the article title: VNF placement, CNF placement, Container placement, VM placement, resource allocation, VNF/Container migration, network slicing, placement in 5G cloud-native, network function splitting and placement, placement in fog computing, edge computing. These keywords search step results in 294 research articles.

2) *Publisher*: Considering the high number of results from the previous keyword search step, the literature selection process focused on research articles published in the following relevant publishers: ACM, IEEE, Elsevier, MDPI, Springer; Wiley and Taylor Francis. The percentage of articles per publisher in the studied universe is summarized in Figure 4. This publisher filtering step results in a reduction from 294 to 217 research articles in the literature.

3) *Abstract reading*: Considering the 217 resulting articles from the publisher filtering step, an abstract reading was performed in order to identify only the most relevant articles that specifically study the VMP problem. After the abstract reading, 176 research articles were selected from the literature. Finally, short papers (i.e., research articles with less than six pages) were removed from the selected literature, resulting in 162 selected articles of the virtual resource placement literature for the detailed the study presented in this survey.

4) *Criteria for Inclusion/Exclusion*: In order to limit our scope, we considered only works published in journals and conferences in the last 8 years (between 2016 and 2022). A selected paper must focus on VNF/CNF placement in different scenarios related to 5G network. It is important to highlight that we have removed works that consider basic VM placement in cloud computing as it was already treated in our previous papers [9] [10]. The inclusion criterion includes studies that comprise the methods, algorithms, frameworks and models for VNF/CNF placement issues.

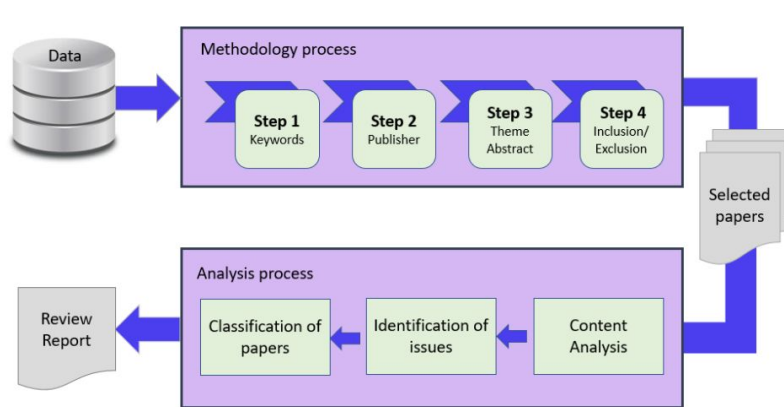


Figure 3: Literature review process

5) *Research questions*: In this paper, the selected literature will answer the following questions:

- What is the specific issues related to VNF and Container placement in 5G Edge computing?
- What are the methods, algorithms and solutions proposed to solve these placement problems ?
- What is the purpose of deploying containers instead of VMs or VNFs in 5G ?
- From the studied papers, what are the best algorithms for VNF or Container placement ?

Table I: A comparison of our work with existing surveys based on key parameters

Ref	Type of virtual resource			Infrastructure			Classification schemes		
	VM	VNF	Container	Cloud	Edge	Fog	Objective functions	Heuristic and meta-heuristic algorithms	Machine learning based orchestration
[11]	X	✓	X	✓	X	X	✓	✓	X
[12]	✓	X	X	✓	X	X	✓	✓	X
[13]	✓	✓	X	✓	X	X	✓	X	X
[14]	X	✓	X	✓	X	X	✓	✓	✓
[15]	X	X	✓	✓	✓	X	✓	✓	✓
[16]	✓	✓	X	✓	✓	✓	✓	✓	X
[17]	✓	✓	X	✓	✓	✓	✓	✓	✓
This survey	X	✓	✓	✓	✓	✓	✓	✓	✓