Software stack for Research writing

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# Research/academic Writing

**Academic writing**
- written by professionals
- Specific to a field
- edited/reviewed by the authors' peers
- often take years to publish.
- language is formal
- list of references

**Non-academic Writing**
- written for the mass public
- published quickly
- language maybe informal and casual
- no reference list
Research/academic Writing

Academic writing
- Academic Journals, Conferences
- Book
- Formal Letter
- Poster
- Presentation
- Thesis
- Bibliography

Non-academic Writing
- Newspapers
- magazine articles
- personal or business letters,
- novels,
- websites
Why is it so important?

Fixed content, but the look/format is different

Example:

Data Pipeline Architecture for Serverless Platform

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ABSTRACT

The amount of data generated by billions of connected IoT devices is growing rapidly. With this, the need for efficient data management systems is increasing. This paper focuses on the development of an efficient data pipeline architecture that can handle the large volume of data generated by IoT devices. The proposed architecture is designed to efficiently manage the data generated by IoT devices, ensuring that the data is processed and analyzed in real-time. The architecture also includes a data processing component that can handle the high volume of data generated by IoT devices. The proposed architecture is designed to be scalable and can handle the increasing volume of data generated by IoT devices. The proposed architecture is also designed to be energy-efficient, ensuring that the data processing component consumes minimal power.

1. Introduction

With the increasing use of connected devices, the amount of data generated is also increasing. This paper focuses on the development of an efficient data pipeline architecture that can handle the large volume of data generated by IoT devices. The proposed architecture is designed to efficiently manage the data generated by IoT devices, ensuring that the data is processed and analyzed in real-time. The architecture also includes a data processing component that can handle the high volume of data generated by IoT devices. The proposed architecture is designed to be scalable and can handle the increasing volume of data generated by IoT devices. The proposed architecture is also designed to be energy-efficient, ensuring that the data processing component consumes minimal power.

MUVINE: Multi-Stage Virtual Network Embedding in Cloud Data Centers Using Reinforcement Learning-Based Predictions

Hitesh Kumar Thakkar, Member, IEEE, Chinmayaa Dalrymple, and Purnus Kranz School, Senior Member, IEEE

Abstract—The recent advances in virtualization technology have enabled the efficient use of cloud computing resources. However, in cloud data centers, the virtual network embedding (INE) problem is highly important and is an integral part of the cloud resource management. The lack of historical knowledge on cloud networking and scalability issues makes the future resource demand uncertain. The recent advances in virtual network embedding (VNE) and cloud computing offer promising solutions to address the resource management problems. However, the current VNE algorithms are not able to fully utilize the available resources, leading to inefficiencies. In this paper, we propose a novel VNE algorithm that uses reinforcement learning to optimize the resource allocation in cloud data centers. The proposed VNE algorithm is evaluated against existing VNE algorithms and shows significant improvements in terms of resource utilization and efficiency.

Keywords—Network virtualization; cloud computing; reinforcement learning; virtual resource allocation.
Why is it so important?

Fixed content, but the look/format is different

Example:
Why is it so important?

- Fixed content, but the look/format is different
  - focus should be on content, not the journal’s format
- Automated typesetting
- Hundreds of references
- Mathematical equations
- Scientific figures

Software Stack

MiKTeX is a modern TeX distribution for Windows, Linux and macOS

\{ \text{TeX} \}\quad \text{One of the most sophisticated digital typographical systems}

\textbf{TexStudio}: An integrated writing environment for creating LaTeX documents

\textbf{Overleaf}: A collaborative cloud-based LaTeX editor used for writing, editing and publishing scientific documents.

\textbf{Zotero}: Free and open-source reference management software

\textbf{JabRef}: Open-sourced, cross-platform citation and reference management software.

And many more...
Latex

- LATEX is a tool used to create professional-looking documents.
- It is based on the WYSIWYM (what you see is what you mean) idea.
- Focus on content, latex will take care of formatting.
  - it separates the content of the document from the style.
- Hundreds of templates available for almost everything from CVs to slideshows.
- .tex file extension
- Recall HTML: `<b> ... </b>` for bold face font
- In Latex: `\textbf{...}` for bold face font
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JabRef

Open-sourced, cross-platform citation and reference management software.

And many more...
A collaborative *cloud-based* LaTeX editor.

Very easy even for beginner:

- Goto [www.overleaf.com](https://www.overleaf.com) -> login
- Select *New Project* -> *Blank Project* -> enter *Project name* -> *Create*

- ...
- ...
- ...

Src: [https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes](https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes)
Short demo

- Create a new project
  - List of templates (ACM double column template)
  - University of Tartu template (tag: unitartucs)
- Project Dashboard
  - Side pane (file Explorer)
  - File Outline
  - New file, new folder, upload
  - Source view -> Rich Text view
  - Online output
  - Goto PDF location in code + goto code location in PDF
- Review + Share + Submit + History + Chat
- Menu
  - Sync + Spell Check + …..
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And many more...
• Download and Install the full version of MikTex:
  • https://miktex.org/download
• Download and install TexStudio:
  • https://www.texstudio.org/#download
• You may refer this old blog:
• ....
• ....
• ....
TexStudio

Editor Walkthrough

• List of symbols
• Math menu
• Wizards -> Quick tabular
• Wizards -> insert image
• Bibliography menu
• Bib file > insert specific bibliography
• Tips:
  • %TODO
  • Make your project a git repository -> no worry if a paragraph is deleted.
    • Options -> Configure TexStudio -> SVN/GIT -> Use Git -> Check-in after File/Save only -> OK
    • To go back to a point: git reset --hard <commit checksum>
    • Use git log to see all commits
(ACM double column template)

Template: https://www.acm.org/binaries/content/assets/publications/consolidated-tex-template/acmart-primary.zip

Latex commands

- Figures
- Tables
- Equations
  - Inline
- Bullet and Numbering
- Mathematical Symbols
- Algorithms
- Citations (\cite) and references(\ref + \label)
- Bibliography
  - Get bibtex entry from Google Scholar
  - Get bibtex entry from Zotero
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Reference management with Zotero

Src: https://www.zotero.org/static/images/home/screenshot-1.4.png
Reference management with Zotero

- Open an Account in [www.Zotero.org](https://www.zotero.org)
  - 300MB storage [Free]
- Download and Install
  - Zotero
  - Zotero Connector for your preferred browser
- Src: [https://www.zotero.org/download/](https://www.zotero.org/download/)
Reference management with Zotero

- Link Zotero Account
- Open Zotero
  - *Edit* -> *Preference* -> *Sync* tab -> *Settings* Tab
  - Under *Data Syncing*, link your account
  - **Bonus**: You may uncheck *Sync full-text content* to save some space
Reference management with Zotero

- Run Zotero
- Under My Library
  - Create a collection

- Open any research article in web browser
  - e.g. : https://ieeexplore.ieee.org/document/9055172
  - Make sure that Zotero Connector is configured
  - Now click on Save to Zotero Extension

- Go to Zotero, you should see the reference entry.
Reference management with Zotero

Zotero Dashboard

- **Layout** (collection pane + item pane + tag selector)
- **Library**
  - Collections
- **Group Library**
- **For each item:**
  - Info + Notes + Tags + Related
- **Tag selector**
Reference management with Zotero

Demo Content

- Adding an Item manually
- Locate
  - Search an item in google search and others
Better BibTex

- an extension for Zotero to manage bibliographic data
  - Goto https://retorque.re/zotero-better-bibtex/installation/
  - Download and install Better BibTex
Export bibliography

• Open Zotero

• Select one or more items, or a collection

• Right click and select *Export Items* or *Export Collection*
  • Format: BibTex
  • You may uncheck all “Translator options”
  • Click on OK
Reference management with Zotero

Zotero with TexStudio

- Open TexStudio -> Open required .tex file
  - Position your cursor, where you want to cite the reference(s)

- Open Zotero
  - Select one or more items (or references)
  - Right click -> Better BibTex -> Push references to TexStudio
  - Now at the end you may export the selected references
BONUS
References

- https://www.midmich.edu/student-resources/lls/library/find-articles/academic-articles
- https://www.geeksforgeeks.org/difference-between-academic-writing-and-non-academic-writing/
- https://www.zotero.org/
- https://www.overleaf.com/project
- https://www.texstudio.org/
- http://www.tug.org/levels.html
- https://texfaq.org/FAQ-latex
- https://www.latex-project.org/