

챗GPT 연구 업무활용

- AI 활용 연구자료 수집 및 PPT 작성

2024년 09월

- AI 활용 논문 자료 조사
- AI 활용 PPT 작성
- 요약

AI 활용 논문 자료 조사

대표적인 AI 활용 연구 사이트



- 퍼플렉시티 : <https://www.perplexity.ai/>
- 엘리시트 : <https://elicit.com/>
- 컨센서스 : <https://consensus.app/>
- 사이스페이스 : <https://typeset.io/>
- ChatPDF : <https://www.chatpdf.com/>
- 코파일럿

The image shows a screenshot of the Toolify.ai website, which is a platform for discovering and using various AI tools. The website has a purple header with the Toolify.ai logo and navigation links for Products, Category, Ranking, AI Models, and Submit & Advertise. Below the header is a search bar and a row of filters including Today, New, Most Saved, Most Used, Browser Extension, Apps, Discord of AI, AI for Jobs, and AI for Capabilities. A second row of filters lists different AI tool categories: Text&Writing, Image, Video, Code&IT, Voice, Business, Marketing, AI Detector, Chatbot, Design&Art, Life Assistant, 3D, Education, and Prompt. The main content area displays a grid of featured AI tools, including Elicit, SciSpace, and Consensus. Below this, a detailed view of the Elicit research assistant interface is shown. It features a search bar with the query "Revolutionizing Railways with Deep Learning: Technologies, Challenges, and Future Prospects" and a sidebar with a "Summary" and "Outline" section. The main content area displays the title "Revolutionizing Railways with Deep Learning: Technologies, Challenges, and Future Prospects" and an "Introduction to Deep Learning in Railways" section with a bulleted list of key points.

Toolify.ai Products Category Ranking AI Models Submit & Advertise

Search by AI, e.g. video translation AI tool

Today New Most Saved Most Used Browser Extension Apps Discord of AI AI for Jobs AI for Capabilities

Text&Writing Image Video Code&IT Voice Business Marketing AI Detector Chatbot Design&Art Life Assistant 3D Education Prompt

elicit scispace consensus Default Default

Profundo

SciSpace Revolutionizing Railways with Deep Learning: Technologies, Challenges, and Future Prospects

4.8M

SciSpace comprehensive

Papers

Summary

Outline

Revolutionizing Railways with Deep Learning: Technologies, Challenges, and Future Prospects

Introduction to Deep Learning in Railways

- What are the key benefits of applying deep learning in railway systems?
- How has AI-powered predictive analytics improved railway maintenance?
- What are some real-world examples of AI applications in railway inspections?

perplexity : <https://www.perplexity.ai/>



새로운 스레드 Ctrl I

홈

발견하기

도서관

지식이 시작되는 곳

무엇이든 물어보세요...

모드 첨부



웹
전체 인터넷에서 검색하기



글쓰기
웹을 검색하지 않고 텍스트
생성 또는 채팅하기



학문모드
게재된 학술 논문에서 검색
하기



비디오
동영상 발견 및 시청하기



수학
방정식을 풀고 수치 답변을
찾기



소셜
토론 및 의견 검색하기

Pro →

Pro 시도하기

이미지 업로드, 더 똑똑한 AI,
그리고 더 많은 Pro Search를
위한 업그레이드.

더 알아보기

- What are the 'Research trends in deep learning application in the railway industry' ?

What are the application

❖ 출처

Railway infrastructure maintenance efficiency improvement using dee...
ncbi.nlm.nih · 1

❖ 답변

Research trends in de
focusing on improving

Railway Infrastruct

Deep reinforcement le
improve railway infras
geometry and component defect data to optimize maintenance strategies and predict
potential issues before they become critical.

Intelligent Railway Surveillance

**SCIENTIFIC
REPORTS**
nature research

[Sci Rep.](#) 2023; 13: 2439.
Published online 2023 Feb 10. doi: [10.1038/s41598-023-29526-8](https://doi.org/10.1038/s41598-023-29526-8)

PMCID: PMC9918517
PMID: [36765166](https://pubmed.ncbi.nlm.nih.gov/36765166/)

Railway infrastructure maintenance efficiency improvement using deep reinforcement learning integrated with digital twin based on track geometry and component defects

[Jessada Sresakoolchai](#) and [Sakdirat Kaewunruen](#)✉

► Author information ► Article notes ► Copyright and License information ► [PMC Disclaimer](#)

Associated Data

- What are the 'Research trends in deep learning application in the railway industry' ?

Deep Learning Trends in Railways

Q What are the 'Research trends in deep learning application in the railway industry' ?

Summary of top 4 papers Copy

Recent research highlights the growing application of deep learning in the railway industry, focusing on safety, infrastructure monitoring, and autonomous operations. Machine learning studies in rail primarily target maintenance activities and traffic management, with China, the US, and the UK leading research efforts (Gu & Lee, 2022). Deep learning techniques are being applied to various aspects of railway safety, including infrastructure monitoring, train components, operations, and station management (Oh et al., 2022). Researchers are exploring deep learning algorithms for fault detection in railway areas and overhead contact systems (Di Summa et al., 2023). Additionally, computer vision and deep learning show promise for autonomous train stop operations, though challenges remain in creating suitable datasets for indoor railway environments (Etzeberria-Garcia et al., 2020). Future research directions include improving ML techniques, addressing security concerns, and overcoming the black-box effect of deep learning models in railway applications (Gu & Lee, 2022).

Sort: Most relevant Filters Export as UPGRADE

Paper	Abstract summary
<input type="checkbox"/> Trends, Topics, Leaders, Influential Studies, and Future Challenges of Machine Learning Studies in the Rail Industry Gu Yong +1 Journal of Infrastructure Systems 2022 · 1 citation DOI	The main research trends in deep learning application in the railway industry are maintenance activities, traffic management, and passenger-related tasks.
<input type="checkbox"/> A Review of Deep Learning Applications for Railway Safety K. Oh +6	The paper reviews deep learning applications for railway safety, including infrastructure, train components, operations, and stations.

Manage Columns

Search or create a column

Describe what kind of data you want to extract

e.g. Limitations, Survival time

COLUMN PRESETS

- + Methodology

ADD COLUMNS

- + Summary
- + Main findings
- + Methodology
- + Intervention
- + Outcome measured
- + Limitations

Show more

consensus : <https://consensus.app/>



- Is Deep Learning Effective for the Railway Industry?

The screenshot displays the Consensus app interface. The main search bar contains the query "Is Deep Learning Effective for the Railway Industry?". Below the search bar, there are two toggle switches: "Synthesize" and "Copilot", both of which are currently turned off. To the right of the search bar, there is a "Filter" button and a search icon. On the right side of the interface, there is a sidebar with various filter options. The "Apply filters" button is at the top of the sidebar. Below it, the "Papers" section is expanded, showing a grid of years from 1990 to 2024. The "Open access" toggle is turned on. The "Copilot available" toggle is also turned on. The "Citations" section shows a minimum of 1 citation. The "Methods", "Journals", and "Domains" sections are collapsed.

Consensus
Find the best science, faster.

Is Deep Learning Effective for the Railway Industry?

☐ Synthesize ☐ Copilot

Filter

Apply filters

Papers

Published since

All 2024 2023 2022 2021 2020 2019 2018 2015 2010 2005 2000 1990

Open access ☒

Copilot available ☒
Ask Copilot about the full text PDF

Citations \geq min 1

Methods ☐

Journals ☐

Domains ☐

consensus : <https://consensus.app/>



- Is Deep Learning Effective for the Railway Industry?

The screenshot displays the Consensus app interface. At the top, the search query 'Is Deep Learning Effective for the Railway Industry?' is entered. Below the search bar, the 'Synthesize' toggle is active and circled in red. To the right of the search bar are buttons for 'Filter (1)', 'Share', and 'Export'. Below the search bar, there are buttons for 'Clear all filters' and '2022-now'. The main content area is divided into two sections. The left section, titled 'Summary' (Beta), shows '10 papers analyzed' and a paragraph stating: 'These studies suggest that deep learning is effective for the railway industry in areas such as fault detection, predictive maintenance, track inspection, autonomous decision-making, and passenger traffic flow prediction.' The right section, titled 'Consensus Meter' (Beta), shows '9 papers analyzed' and a horizontal bar chart with three categories: 'Yes - 89%' (green), 'Possibly - 11%' (yellow), and 'No - 0%' (red). Below these sections, a red box highlights a study titled 'A Review on Deep Learning Techniques for Railway Infrastructure Monitoring' by M. Di Summa et al. (IEEE Access, 2023). The study abstract states: 'Deep learning algorithms can be used for classification, segmentation, and detection of faults in the railway sector, improving safety levels.' At the bottom of the interface, there are buttons for 'Study snapshot', 'Save', 'Cite', and 'Share'.

Is Deep Learning Effective for the Railway Industry?

☒ Synthesize ☐ Copilot

Clear all filters X 2022-now X

Summary Beta
10 papers analyzed

These studies suggest that deep learning is effective for the railway industry in areas such as fault detection, predictive maintenance, track inspection, autonomous decision-making, and passenger traffic flow prediction.

Consensus Meter Beta
9 papers analyzed

- ✓ Yes - 89%
- Possibly - 11%
- ✗ No - 0%

A Review on Deep Learning Techniques for Railway Infrastructure Monitoring — Unknown

Deep learning algorithms can be used for classification, segmentation, and detection of faults in the railway sector, improving safety levels.

IEEE Access | M. Di Summa et al. | 1 citations | 2023

Study snapshot Save Cite Share


• What are the contributions of this paper?

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582

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Popular Tools



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Get all answers backed by citations.



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Best for Researchers




Literature Review

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Railway infrastructure maintenance efficiency improvement using deep reinforcement learning integrated with digital twin based on track geometry and component defects

Jessada Sresakoolchul & Sakdirat Kaewunruen^{1,2}

Railway maintenance is a complex and complicated task in the railway industry due to the number of its components and relationships. Ineffective railway maintenance results in excess cost, defective railway structure and components, longer possession time, poorer safety, and lower passenger comfort. Of the three main maintenance approaches, predictive maintenance is the trendy one, and is proven that it provides the highest efficiency. However, the implementation of predictive maintenance for the railway industry cannot be done without an efficient tool. Normally, railway maintenance is corrective when some things fail or preventive when maintenance is routine. A novel approach using an integration between deep reinforcement learning and digital twin is proposed in this study to improve the efficiency of railway maintenance which other techniques such as supervised and unsupervised learning cannot provide. In the study, Advantage Actor Critic (A2C) is used to develop a reinforcement learning model and agent to fulfil the need of the study. Real world field data over four years and 30 km, is obtained and applied for developing the reinforcement learning model. Track geometry parameters, railway component defects, and maintenance activities are used as parameters to develop the reinforcement learning model. Rewards (or penalties) are calculated based on maintenance costs and occurring defects. The new breakthrough exhibits that using reinforcement learning integrated with digital twin can reduce maintenance activities by 21% and reduce the occurring defects by 68%. Novelty of the study are the use of A2C which is faster and provides better results than other traditional techniques such as Deep Q-learning (DQN), each track geometry parameter is considered without combination into a track quality index. Field data are used.

Key Contributions of the Paper

The paper presents several significant contributions to the field of railway infrastructure maintenance through the integration of deep reinforcement learning and digital twin technology. Here are the main contributions:

- Novel Approach:** The study introduces a unique method that combines deep reinforcement learning with digital twin technology, which is not commonly found in existing literature. This integration aims to enhance the efficiency of railway maintenance, addressing limitations of traditional methods like supervised and unsupervised learning, which only provide one-time predictions [1].
- Use of Advantage Actor Critic (A2C):** The paper employs the A2C algorithm, which has been shown to outperform traditional techniques such as Deep Q-learning (DQN) in terms of performance and processing time. This choice of algorithm is a key innovation that contributes to the overall effectiveness of the maintenance model [1].
- Detailed Parameter Analysis:** The study meticulously analyzes track geometry parameters and component defects separately rather than combining them into a single track quality index. This detailed approach allows for a more nuanced understanding of the factors affecting railway maintenance [2].
- Field Data Utilization:** The reinforcement learning model is developed using real-world field data collected over four years (2016-2019) from a 30 km track. This empirical basis strengthens the model's applicability and relevance to actual railway maintenance scenarios [3].
- Improved Maintenance Efficiency:** The results indicate that the proposed model can reduce maintenance activities by 21% and decrease the occurrence of defects by 68%. This demonstrates a significant improvement in maintenance efficiency, which is crucial for the railway industry [1].
- Guidelines for Future Applications:** The paper serves as a pioneering guideline for applying reinforcement learning and digital twins in railway maintenance, aiming to reduce defects, maintenance costs, and possession time while enhancing safety and passenger comfort [1].

한국어로 해줘

9:37 AM

논문의 주요 기여

이 논문은 심층 강화 학습과 디지털 트윈 기술의 통합을 통해 철도 인프라 유지보수 분야에 여러 중요한 기여를 하고 있습니다. 주요 기여는 다음과 같습니다:

- 새로운 접근법:** 이 연구는 심층 강화 학습과 디지털 트윈 기술을 결합한 독창적인 방법을 제시합니다. 이는 기존 문헌에서 흔히 찾아볼 수 없는 접근법으로, 전통적인 방법인 감독 학습 및 비감독 학습의 한계를 극복하고 철도 유지보수의 효율성을 향상시키는 것을 목표로 합니다 [1].
- Advantage Actor Critic (A2C) 사용:** 논문에서는 A2C 알고리즘을 사용하여, 이는 Deep Q-learning (DQN)과 같은 전통적인 기술보다 성능과 처리 시간 면에서 우수한 결과를 보여줍니다. 이 알고리즘의 선택은 유지보수 모델의 전반적인 효과성에 중요한 혁신입니다 [1].
- 세부 매개변수 분석:** 연구는 트랙 기하학 매개변수와 구성 요소 결함을 별도로 분석하여, 단일 트랙 품질 지수로 결합하지 않습니다. 이러한 세부적인 접근은 철도 유지보수에 영향을 미치는 요인에 대한 보다 미세한 이해를 가능하게 합니다 [1].
- 현장 데이터 활용:** 강화 학습 모델은 30km 트랙에서 4년(2016-2019) 동안 수집된 실제 현장 데이터를 사용하여 개발되었습니다. 이러한 실증적 기반은 모델의 적용 가능성과 실제 철도 유지보수 시나리오에 대한 관

What is the novelty of this paper?

Suggest 10 keywords that can classify this paper.

Explain the concept {keyword} by comparing with a related concept. Make a summary table.

What is the rationale of using {method} method?

Ask me 5 questions to assess my comprehension of this paper.

이 논문의 새로움은 무엇인가요?

이 논문을 분류할 수 있는 키워드 10개를 제시하세요.

{키워드} 개념을 관련 개념과 비교하여 설명하고, 요약 표를 만들어 주세요.

{방법} 방법을 사용하는 이유는 무엇인가요?

이 논문에 대한 이해도를 평가할 수 있는 질문 5가지를 작성해 주세요.

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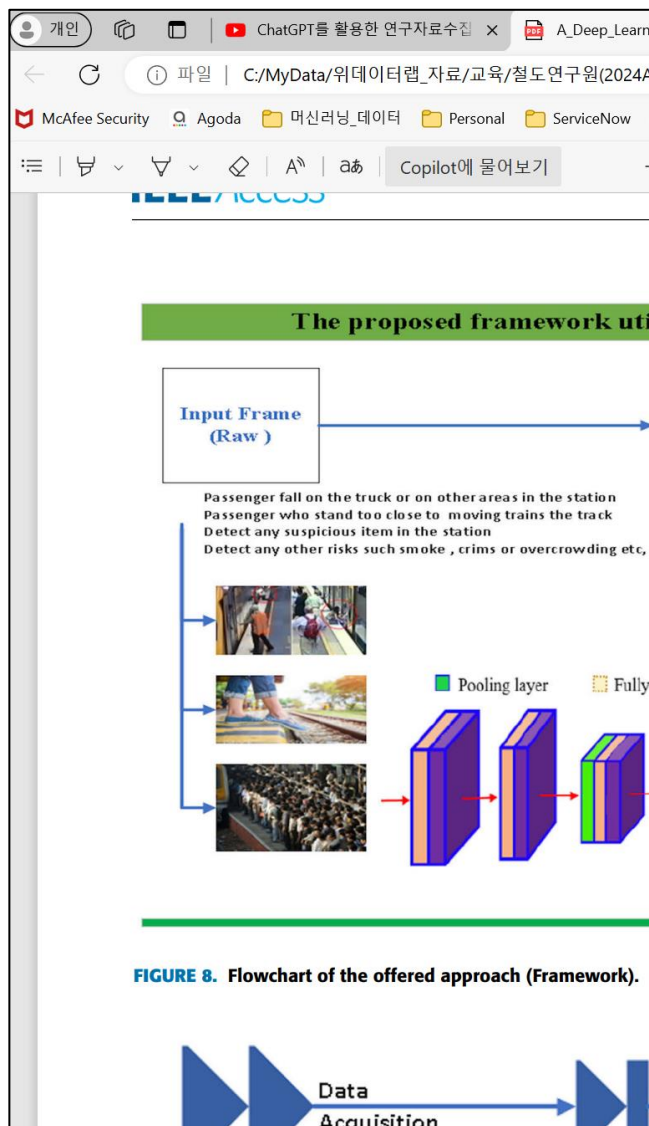
[Sign in](#) to save your chat history

AI_Data_2.pdf



인공지능 훈련 데이터에 대한 지적 재산권 문제는 여러 나라에서 논의되고 있습니다. 이 파일에서는 데이터 공유에 중점을 둔 입법, 규제 샌드박스 기간의 도입 등의 방법이 추구되며, 이러한 방법들은 인공지능 시대에 데이터 보호와...

3개월 전



당신

고등학생 수준으로 논문의 내용을 설명해 줘



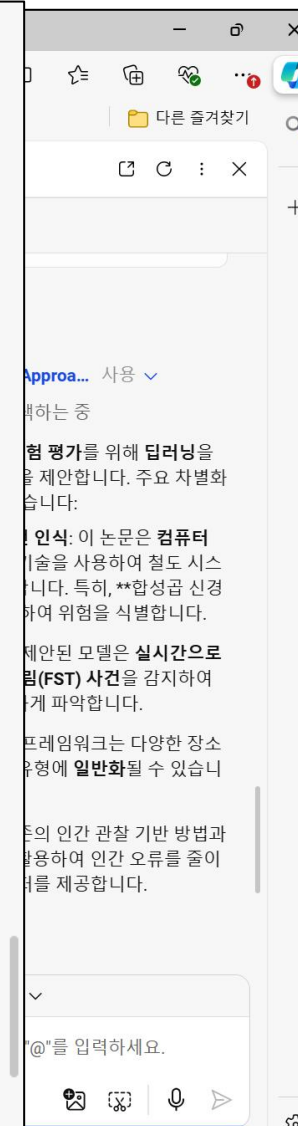
Copilot

웹 사용

이 논문은 철도역에서 발생할 수 있는 위험을 줄이기 위해 ****인공지능(AI)****을 사용하는 방법을 설명하고 있어요. 주요 내용은 다음과 같습니다:

1. **컴퓨터 비전과 패턴 인식:** 철도역에서 사람들이 넘어지거나 미끄러지는 등의 위험한 상황을 **카메라와 AI 기술**을 이용해 감지합니다.
2. **딥러닝 모델:** ****합성곱 신경망(CNN)****이라는 딥러닝 기술을 사용해 위험한 행동을 자동으로 인식하고 분류합니다.
3. **실시간 모니터링:** 이 시스템은 실시간으로 작동하여 위험한 상황을 빠르게 감지하고 경고를 보냅니다.
4. **비용 효율성:** 기존의 CCTV 시스템을 활용하기 때문에 추가 비용이 적게 듭니다.
5. **일반화 가능성:** 이 모델은 다양한 장소와 상황에 적용할 수 있어 철도역뿐만 아니라 다른 공공장소에서도 사용할 수 있습니다.

이 논문은 철도역의 안전을 높이고 사고를 줄이기 위한 혁신적인 방법을 제안하고 있어요. 이해하기 쉽죠? 😊

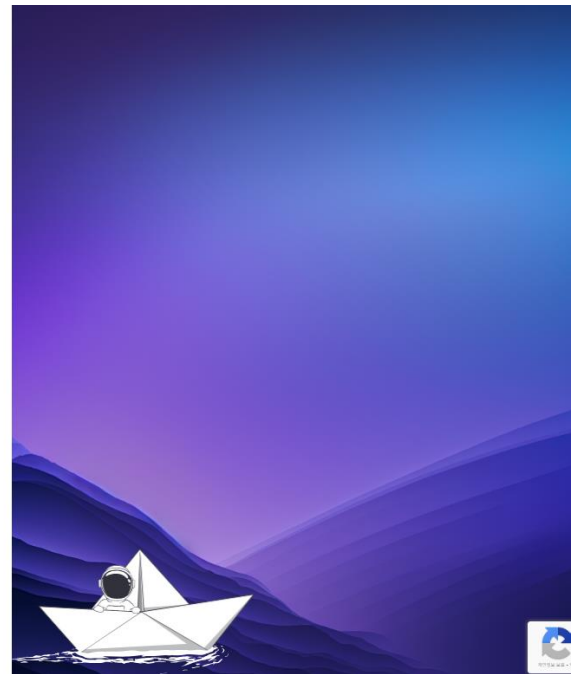
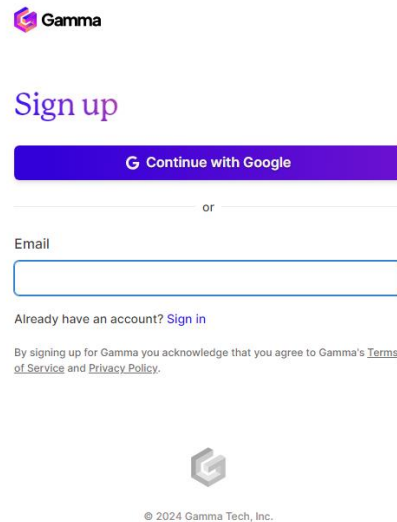


AI 활용 PPT 작성

Gamma : <https://gamma.app/>



- PPT 제작도구
- 팀작업/개인작업 가능



단계 1/2 Gamma에 오신 것을 환영합니다

시작하려면 작업 공간의 이름을 지정하세요.

☒ 팀 또는 회사 ☐ 개인

작업 공간 이름

|Team or company name

작업 공간 만들기

P.S. 이 설정은 나중에 언제든지 전환할 수 있습니다 🍌



생성형 AI 개념 이해

생성형 AI는 새로운 콘텐츠를 생성하는 인공지능 기술입니다.

 by 승우 강

자동 저장 ● 끄 Deep Learning in Railways • 이 PC에 저장됨 🔍 검색

파일 홈 삽입 그리기 디자인 전환 애니메이션 슬라이드 쇼 녹음/녹화 검토 보기 도움말

클립보드 새 슬라이드 레이아웃 다시 설정 구역

가 가 간 S 커 가 가 가 가

단락 SmartArt로 변환

그리기 정렬 빠른 스타일 도형 채우기 도형 윤곽선 도형 효과

찾기 바꾸기 선택

받아 쓰기 추가 기능 디자이너

디자이너

1. Introduction

2. Key Applications of Deep Learning in Railway Systems

3. Technical Implementation

4. Challenges and Limitations

5. Future Prospects

6. Strategies to Overcome Challenges

1. Introduction

Deep learning: A transformative technology in railway systems

Key benefits: Enhanced safety and operational efficiency

여기에 슬라이드 노트의 내용을 입력하십시오

1) PPT 내용을 Text 파일로 생성

- <https://claude.ai/> :

다음 주제에 대해 Power Point 개요를 작성해줘.

개요 레벨은 한 단계로 해줘.

Deep Learning in Railways: Technologies, Challenges, and Future Prospects

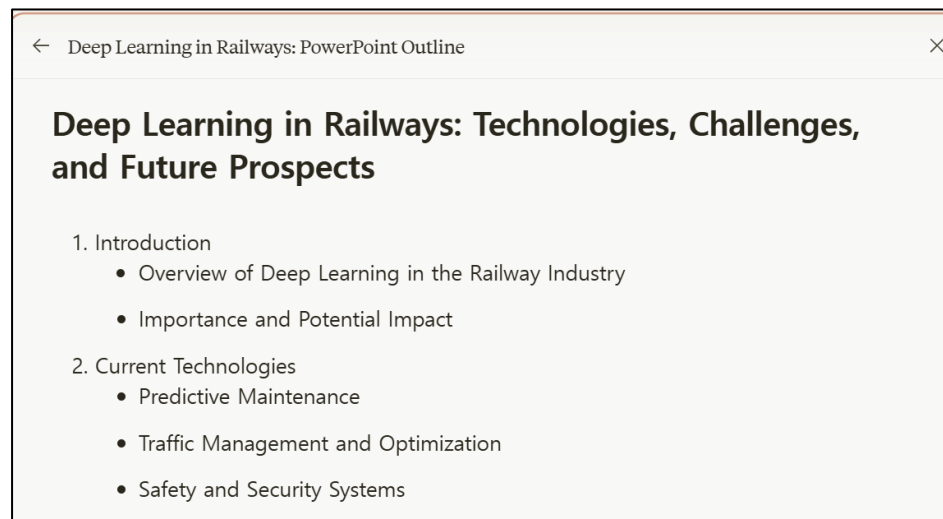
2) 결과를 notepad 에 복사

3) tab 을 사용하여 각 페이지 내용 구분

4) 해당 파일을 'UTF 16 LE' (Little Endian) 인코딩으로 저장

5) 새 프리젠테이션에서 해당 텍스트 파일 열기

6) 디자이너 기능을 이용하여 꾸미기



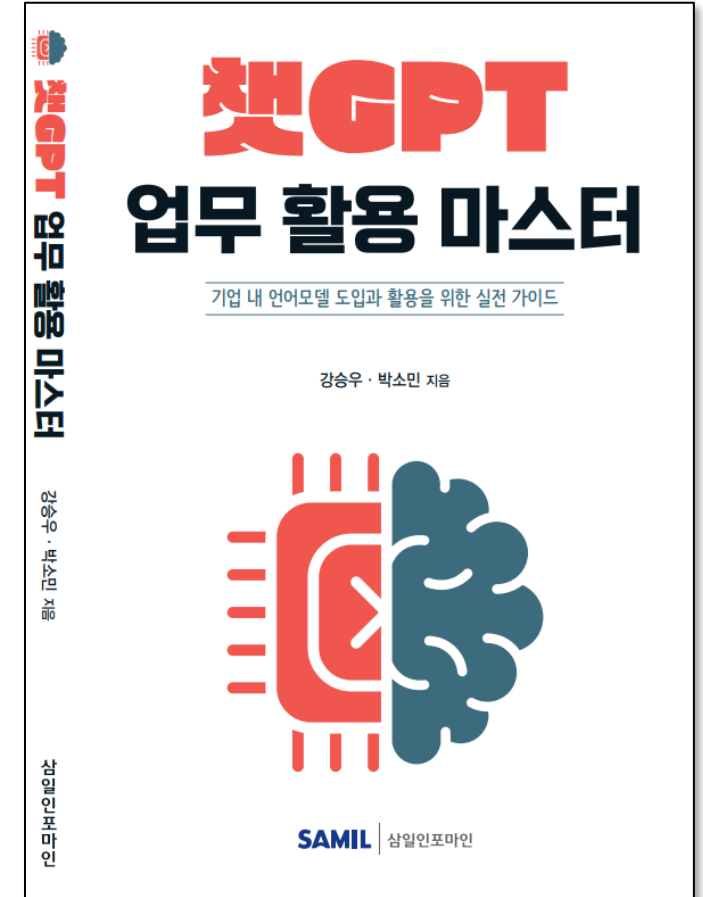
요약

- AI 활용 자료 조사 사이트

- ✓ 퍼플렉시티 : <https://www.perplexity.ai/>
- ✓ 엘리시트 : <https://elicit.com/>
- ✓ 컨센서스 : <https://consensus.app/>
- ✓ 사이스페이스 : <https://typeset.io/>
- ✓ ChatPDF : <https://www.chatpdf.com/>
- ✓ 코파일럿

- AI 활용 PPT 생성

- ✓ Gamma : <https://gamma.app/>
- ✓ 파워포인트 디자이너



감사합니다.