

Part 1: Al as a reading partner

daily efficient literature searching and reading

[ВООК] Machine learning: architecture in the age of artificial intelligence

P Bernstein - 2022 - taylorfrancis.com

... core operating strategies, 11 most artificial intelligence available to architects is delivered .. As we consider the implications of machine learning and artificial intelligence in this context, ..

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Artificial intelligence for predictive and evidence based architecture design

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Parastoo Samadi 🗹, Sepideh Sedghimehr, Shirin Shevidi & Ali Andaji Garmaroodi

Abstract

This paper introduces a computational framework driven by a generative algorithm that allows both architects and non-experts to create various floorplan layouts for predefined residential unit boundaries. This generative tool, implemented in GhPython and Grasshopper, enables users to customize floor plans by defining specific area requirements, accommodating diverse user preferences and facilitate the design process. Also, a catalog of module-based slices containing different functional spaces with determined dimensions have been designed as a reference for the algorithm to generate the final layouts. The generative algorithm, which uses numerical data from each slice, produces floorplan configurations based on the adjacency of functional spaces and user-defined parameters. The bottom-up approach of the algorithm means that the results are noticeably influenced by the designed slices. With the intention of providing the users with a more intuitive understanding of housing layouts, the generated floorplans are presented as furnished 3D models, clustered under specific categories.

Frequent translations needed

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Summary of the paper 20240216 SiGraDi23...

480.25KB

这篇论文研讨了將大型语言模型 (LLM) 作为建筑设计过程中的设计伙伴,而不仅仅是一个被动的问题回答机 据过结合对话题的 (CT) 和LLM,提出了一种新的设计框架,旨在通过口头和非口头反馈与设计师进行持 绩的对话。并避改业美对话数据进行被调。逐步距离对话的有效性。

1. 背雲与研究框架

- 当今AI的流行及其对设计学科的影响:强调了技术应用的现实世界背景的重要性,指出了计算技术的 误用可能导致设计学科中的不期望后果。
- 对话作为人机交互的重点:介绍了控制论的起源及其在人机交互中的应用,强调了对话在设计环境中的重要件。
- 大型语言模型(LLMs)的潜力:讨论了LLMs在自然语言处理(NLP)中的应用及其通过迁移学习成为领域专家的潜力。

2. 模拟场景:

- CT和LLM在设计场景中的整合: 受Musicolour和URBAN5的启发,提出了将CT和LLM整合到建筑设计场景中的实验。
- 方法和Rhino-Grasshopper实现:使用Rhino和Grasshopper进行模拟,收集设计行为和脑电波数据,并将其发送给LLM进行处理和反馈。
- 步骤一:设置环境:包括安装脑电波传感器和初始算法设置。
- 步骤二: 收集数据: 收集设计师的行为数据和心理状态数据。
- 步骤三: 将数据编译到LLM: 将收集的数据编译成段落供LLM处理
- 步骤四: 将响应转换为反馈: 将LLM的响应转换为口头和非口头反馈,

3. Mark I原型发现:

- 发现:口头反馈提供了直接明确的句子,但存在不一致性和干扰问题。
- 反思和改进提议:提出了通过手动干预机制和强化学习来改进LLM的响应一致性和减少干扰。

4. 讨论:

- 结论和贡献: 展示了LLM在建筑设计场景中的实际应用潜力,但也指出了概念和技术上的挑战。
- 未来研究方向:包括从一对一场景扩展到多对多场景,以及探索声音、温度等其他空间特质的反馈。

5. 致谢:

Too-generic Al summary

Time consuming for screening

Part 1: Al as a reading partner (1/3)

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With easyScholar plugin

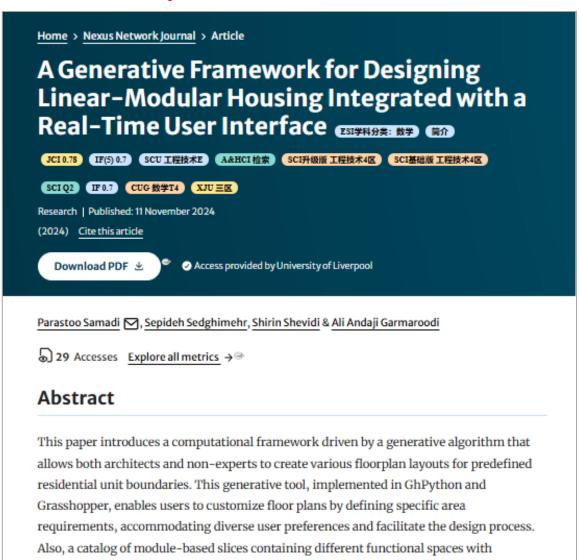


Show journal index and ranking:

Intuitive for initial screening

Part 1: Al as a reading partner (2/3)

Frequent translations needed



With **KimiExplorer** plugin



Immediate translation and Q&A

Part 1: Al as a reading partner (3/3) With <u>Tencent Yuanbao</u>

Too-generic AI summary



Part 1: Al as a reading partner (3/3)

Too-generic AI summary

Summary of the paper

20240216 SiGraDi23...



这篇论文探讨了将大型语言模型(LLM)作为建筑设计过程中的设计伙伴,而不仅仅是一个被动的问题回答机器。通过结合对话理论(CT)和LLM,提出了一种新的设计框架,旨在通过口头和非口头反馈与设计师进行持续的对话,并通过收集对话数据进行微调,逐步提高对话的有效性。

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With Tencent Yuanbao

研究背景

- 研究问题: 这篇文章探讨了如何利用人工智能(AI)和扩散模型来增强建筑设计过程中的创造力与创新性。具体来说,研究了 在建筑设计初期阶段,通过组合使用扩散模型和参数化建模来预测,开发和优化环保设计提案的可能性。
- 研究准点:该问题的研究准点包括:如何有效地將AI生成的图像应用于建筑设计过程,如何在设计初期阶段实现气候适应性的 设计提案,以及如何整合多学科的方法来应对这一挑战。
- 3. 相关工作:相关工作包括Neri Oxman提出的Krebs循环创造力理论,Generative Adversarial Networks (GANs) 及其各种版本 (如Progressive GANs、StyleGANs、Conditional GANs、Creative GANs等),以及最新的latent Diffusion Models (LDMs, 如DALLE 2、MidJourney和Stable Diffusion)。

研究方法

这篇论文提出了一种名为"设计智能策略"的方法,用于解决建筑设计过程中创新和可持续设计解决方案的早期阶段问题。具体来说。

气候原型参数: 首先,研究建立了气候原型参数的参考表,包含选定的生物气候设计参数摘要。这些参数用于提示和图像生成、评估和优化阶段的参考。



2. 提示工程: 其次,研究进行了三个实验,探索了不同提示结构在扩散模型中生成的图像、每个实验包括两个生成步骤: 第一步 仅包含文本输入,第二步则提供输入图像(片段)和前一步的提示结构。实验结果表明,包含具体、具体词语和输入图像的提示结构效果最佳。



3. 生成优化: 最后,研究使用Rhinoceros/Grasshopper算法建模工具,将选定的2D图像转换为参数化的3D模型进行优化。优化过程中定义了三个标准: 开口的通风和形式比例。材料与资源可用性相关的材料消耗和房屋大小。



实验设计

实验设计包括以下三个阶段:



Deep-reading functionMore specific for literature review

Part 2: Al as a poster and banner design partner





Part 2: Al as a poster and banner design partner

Software used:

Al-image generation, expansion: Fooocus (locally installed)

Al-image enlargement: Fooocus (locally installed) / HiPictureAmplifier 嗨格式图片无损放大器 (paid)

Image editing: Adobe Illustrator / Photoshop







Al-generated Al-expansion Al-enlarge, edit

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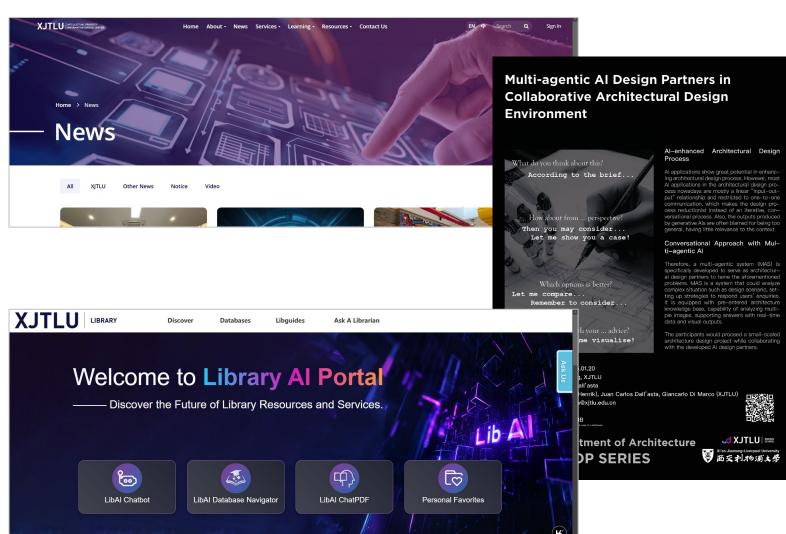




Part 2: Al as a poster and banner design partner

fast poster and banner design





Summary

- Part 1: Al as a reading partner
- Aim: demonstrates how Al and other on-hand tools help in daily efficient literature searching and reading
- a) A browser plugin for searching and identifying journal levels
 - Tool: <u>easyScholar</u>
- b) A browser plugin for real-time translating and Q&A abstract
 - Tool: Kimi Explorer
 - Alternative: Zhipu Extension
- c) A web-based Al application for quick-reading literature
 - Tool: <u>Tencent Yuanbao(</u>腾讯元宝)
 - Alternative: ChatDoc
- Part 2: Al as a poster and banner design partner
- · Aim: demonstrate how AI and other tools help in fast poster and banner design
- a) Al image generation
 - Tool: Foocus (local)
 - Alternatives: Zhipu, HuluAl (Paid)
- b) Image editing (expanding, enlarging)
 - Tool: <u>Fooocus</u> (local), <u>HiPictureAmplifier</u>, Adobe Illustrator
 - Alternatives: InvokeAl (local), Midjourney, DALLE-3, Adobe Photoshop
- c) Adding texts and touch-up
 - Tool: Adobe Illustrator
 - Alternatives: Adobe Photoshop / any image editing software



