PAPER - 1: Product Design Using a Generative Adversarial Network: Incorporating Consumer Preferences and External Data (01-JAN-2024)

Generative AI has enabled large-scale automation in product design, but traditional methods often miss consumer preference data from internal sources. Additionally, valuable insights from external sources like social media and UGC are underutilized. This results in inefficiencies, where companies develop designs that may not align with consumer preferences, leading to wasted resources.

A semi-supervised framework is developed combining a predictor model, which learns consumer preferences from historical data, with a generative model to guide design generation. They used a Continuous Conditional Generative Adversarial Network (CcGAN) to create designs aligned with specific consumer preferences. The framework was tested in a real-world case study with a self-aided photography chain in China, where it successfully generated new photo templates.

Year of publication	Journal name	Limitations	Future work
2024	Social Science Research Network	The model's effectiveness depends on high-quality data Its complexity may be difficult for firms without advanced technical skills, and further research is needed to adapt it for use in other industries or product types.	enhance the model to better capture diverse consumer preferences, adapt the framework for other industries, and improve scalability and efficiency for broader accessibility.

PAPER - 2
Art Design and Interior Color Selection for New Energy Vehicles using sustainable AI algorithm

Jia, Yong. "Art Design and Interior Color Selection for New Energy Vehicles using sustainable AI algorithm." Journal of Electrical Systems, null (2024). doi: 10.52783/jes.3926

The study aims to develop a sustainable AI algorithm for art design and interior color selection in NEVs, focusing on optimizing design by analyzing market trends, customer preferences, and sustainable color options to enhance appeal and eco-friendliness.

The study involves creating a machine learning algorithm(EFAACS-NEV) that analyzes a database of design elements and color options, utilizing real-time data from sensors to optimize energy efficiency, performance, and cost reduction.

Year of publication	Journal name	Limitations	Future work
2024	Journal of Electrical Systems	limited data availability for AI challenges in ensuring the accuracy and reliability of AI algorithms crucial for safety and efficiency the dependency of AI on battery power, which can affect energy optimization and vehicle	improve data availability, enhancing algorithm accuracy, and optimizing battery usage, along with developing a robust regulatory framework for AI in NEVs to ensure safe and responsible use.

		performance.	

PAPER - 3 : Smart product platforming powered by AI and generative AI: Personalization for the circular economy

Pervaiz, Akhtar., Dr, Arsalan, Mujhaid, Ghouri., Dr, Aniqa, Ashraf., Dr, Jia, Jia, Lim., Dr, Naveed, R., Khan., M.A., Shuang. "Smart product platforming powered by AI and Generative AI: Personalization for the circular economy." International Journal of Production Economics, null (2024). doi: 10.1016/j.ijpe.2024.109283

https://typeset.io/papers/smart-product-platforming-powered-by-ai-and-generative-ai-1p37uc4zes

The paper aims to integrate advanced AI technologies into intelligent systems to enhance functionality, efficiency, and performance. It addresses current integration challenges and proposes innovative solutions to improve adaptability and scalability, ultimately contributing to smarter, more efficient systems for industry and society.

methodology integrates AI into intelligent system design, emphasizing process optimization, decision-making, and performance enhancement. It uses advanced algorithms and data techniques for adaptable, scalable systems and includes detailed steps for development, testing, and deployment to address technology integration challenges.

Year of publication	Journal name	Limitations	Future work
2024	International Journal of Production Economics	challenges in generalizing findings to different domains, the need for more real-world testing, and potential scalability issues of the AI systems	developing advanced, lightweight products that enhance quality while minimizing environmental impact, time, and cost. Explore bioinspired generative design

PAPER - 4
Contribution to the work of the Interministerial Committee on Generative Artificial Intelligence

The aim of this contribution is to provide the Interministerial Committee for Generative AI with insights into the environmental footprint of generative AI. The goal is to propose concrete actions that promote sustainable practices in AI development, aiming for carbon neutrality and encouraging international cooperation for establishing common standards.

The study primarily involves a review and analysis of existing data and literature on the environmental impact of generative AI. The methodology includes:

1. **State of the Art Review**: The study presents a state of the art of the environmental footprint of generative AI, focusing on greenhouse gas emissions, water consumption, and energy use.

2. **Recommendation Development**: Based on the literature review, the study develops recommendations aimed at reducing the environmental impact of AI through improved practices in energy efficiency, data centre management, and the use of renewable energy.

Year of publication	Journal name	Limitations	Future work
2024	UNESCO	challenge of accurately measuring AI models' environmental impact due to complex, variable factors, and the dependence on broader industry and regulatory actions for implementing recommendations, which may be beyond the authors' control.	developing energy-efficient AI models, adopting sustainable practices, establishing international standards, and conducting ongoing research to better understand and reduce AI's environmental impact.

PAPER - 5

Ref https://typeset.io/papers+/generative-ai-tools-in-web-design-1yoh4bl825

Generative AI Tools in Web Design

Minela, Ganović., Aldina, Avdić. "Generative AI Tools in Web Design." null (2024). doi: 10.15308/sinteza-2024-392-397

The aim of the research is to analyze the application of Generative Artificial Intelligence (GAI) tools in web design. The study explores how GAI can improve website design and user experience in the digital age by focusing on specific tools like Canva, ChatGPT, WixADI, and AI Art Generator.

The research methodology involved an experimental approach where the performance of various GAI tools (Canva, ChatGPT, WixADI, and AI Art Generator) was tested and compared with traditional web design approaches (HTML, CSS, JavaScript). The methodology included developing two websites—one using traditional methods and the other using GAI tools—and then evaluating their performance through suu7rveys and user feedback. The user experience was assessed by gathering ratings from participants on different aspects like functionality, design, content, responsiveness, and overall performance.

Year of publication	Journal name	Limitations	Future work
2024	INTERNATIONAL SCIENTIFIC CONFERENCE ON INFORMATION TECHNOLOGY, COMPUTER SCIENCE, AND DATA SCIENCE	Limited customization options in some GAI tools. Potential lack of personalization when using AI-generated content. The performance of AI	focus on enhancing the adaptability and personalization of GAI tools in web design, exploring their long-term impact on user experience, and integrating advanced AI technologies.

		tools might vary depending on the specific needs and requirements of individual projects	

PAPER - 6

The Role and Impact of Sustainable Design in AI Digital Media and Arts

"The Role and Impact of Sustainable Design in AI Digital Media and Arts." Art and performance letters, 5 (2024). doi: 10.23977/artpl.2024.050224

Ref https://typeset.io/papers/the-role-and-impact-of-sustainable-design-in-ai-digital-37nobw8y2y

The aim of the paper is to explore the significance and role of sustainable design within the context of AI digital media and arts. It emphasizes the need to consider environmental, social, and economic sustainability in the development and application of AI in these fields, providing insights and guidance for future developments.

The paper employs a combination of case studies and theoretical discussions to explore how sustainable design can be integrated into AI digital media and arts. It analyzes existing applications of AI in digital media and artistic creation, focusing on their environmental, social, and economic impacts. It also discusses the implementation of sustainable practices in these fields, such as reducing energy consumption, using recyclable materials, and promoting fair trade and social responsibility.

Year of publication	Journal name	Limitations	Future work
2024	Art and performance letters	limitations in integrating AI with sustainable design, including technological constraints, the challenge of balancing human creativity with AI, and social, legal, and ethical concerns.	explore deeper integration of AI and sustainable design for industry innovation, urging collaboration among governments, businesses, and society.

PAPER - 7
Exploring the Potential of Generative Artificial Intelligence
https://typeset.io/papers/exploring-the-potential-of-generative-artificial-5d4ogpmt4k

Deepak, Kumar, Sahu. "Exploring the Potential of Generative Artificial Intelligence." Indian Scientific Journal Of Research In Engineering And Management, null (2024). doi: 10.55041/ijsrem30555

The paper explores generative AI technologies like Transformers, VAEs, and GANs, examines their applications in IT, data augmentation, and NLP, addresses ethical issues such as privacy and bias, and highlights recent advancements like Sora and DEVIN AI.The methodology involves analyzing generative AI

technologies and their applications in NLP (e.g., GPT-3 for dialogue and translation) and data augmentation (creating artificial data samples to enhance datasets).

Year of publication	Journal name	Limitations	Future work
2024	Indian Scientific Journal Of Research In Engineering And Management	Bias and Fairness Ethical Concerns Privacy Issues	develop more robust bias detection algorithms, diversifying training datasets, and implementing stronger privacy protection measures. Additionally, explore new applications of generative AI in various industries

PAPER - 8
Examining the impact of generative artificial intelligence on work dynamics
https://typeset.io/papers/examining-the-impact-of-generative-artificial-intelligence-56bqzubo3w

David, Richard, Lozie., Robina, Omasa., Sara, Hesami., Shenjuti, Zaman., Mahsa, Kajbaf., Amina, Raza, Malik. "Examining the impact of generative artificial intelligence on work dynamics." null (2024). doi: 10.18282/hrms.v6i2.3420

The main aim of the study is to examine the impact of generative artificial intelligence (AI) on work dynamics, particularly focusing on employee well-being, efficiency, job satisfaction, ethical considerations, and work-life balance.

The study employs a qualitative approach using three semi-structured interviews. The participants were selected based on their experience with generative AI tools in different industries. The interviews aimed to explore the participants' motivations for using generative AI, its impact on their work, and any ethical concerns. The methodology focuses on obtaining in-depth insights into the real-life experiences of employees using generative AI.

Year of publication	Journal name	Limitations	Future work
2024	Human Resources Management and Services	The small sample size limits generalizability, the findings are context-specific, and the convenience sampling method may introduce bias.	research will expand to diverse participants and industries, conduct longitudinal studies on AI’s long-term effects, and compare different AI tools' impacts. It will also delve into ethical concerns related to job security and mental health.

PAPER - 9
Exploring the Potential of Collaborative Processes in Product Design through Generative Artificial Intelligence

https://typeset.io/papers/exploring-the-potential-of-collaborative-processes-in-neaj23ygrk

S, Oh., Sung-Chan, Song. "Exploring the Potential of Collaborative Processes in Product Design through Generative Artificial Intelligence." Design research, 9 (2024).:573-584. doi: 10.46248/kidrs.2024.2.573

The study explores collaborative approaches in product design using generative AI, highlighting AI's potential to enhance traditional methods, the roles of humans and AI, the importance of designer judgment and prompts, and the evolving nature of design with advancing AI technology.

The study investigated AI's role in product design, showing that while AI generates visuals, human judgment is crucial for design selection. Effective use of prompts and language is essential for deploying generative AI effectively

Year of publication	Journal name	Limitations	Future work
2024	Design research	Designer's judgment crucial in selecting designs. Effective use of prompts through questions is crucial.	enhancing design efficiency with AI, merging AI advancements with traditional methods, and emphasizing the role of user knowledge in leveraging AI for design.

PAPER - 10

Eco-Centric Generative Design Workflow: Extending Sustainability in Architecture(2024)

Zhenxiang, Zang., Wenhong, Ding. "Eco-Centric Generative Design Workflow: Extending Sustainability in Architecture." Frontiers in artificial intelligence and applications, null (2024). doi: 10.3233/faia240006

https://typeset.io/papers/eco-centric-generative-design-workflow-extending-2wpvb9id2m

The study explores the benefits of integrating generative design technologies into sustainable building design, covering model training, design proposals, optimization, and visualization to enhance efficiency and ecological impact in architecture.

The methodology involves using generative design technologies and AI for sustainable building design, including self-supervised learning for model training, Genetic Algorithms for optimization, and visualization for performance assessment.

Year of publication	Journal name	Limitations	Future work
2024	Frontiers in artificial intelligence and applications	Quantifiable limitations include data quality and parameter accuracy, while non-quantifiable	Future work includes more case studies on integrating generative design for sustainability,

		limitations involve addressing complex human factors in design.	research on self-supervised learning for autonomous design optimization, and expanding AI applications to enhance architectural workflows and sustainability.

PAPER - 11
Learning from Nature to Achieve Material Sustainability: Generative AI for Rigorous Bio-inspired Materials Design

Rachel, K., Luu., Sofia, Arevalo., Wei, Lu., Bo, Ni., Zhenze, Yang., Sabrina, C., Shen., Jaime, Berkovich., Yu-Chuan, Hsu., Stone, Zan., Markus, J., Buehler. "Learning from Nature to Achieve Material Sustainability: Generative AI for Rigorous Bio-inspired Materials Design." null (2024). doi: 10.21428/e4baedd9.33bd7449

REF https://typeset.io/papers/learning-from-nature-to-achieve-material-sustainability-2060v6fa1g

Rachel, K., Luu., Sofia, Arevalo., Wei, Lu., Bo, Ni., Zhenze, Yang., Sabrina, C., Shen., Jaime, Berkovich., Yu-Chuan, Hsu., Stone, Zan., Markus, J., Buehler. "Learning from Nature to Achieve Material Sustainability: Generative AI for Rigorous Bio-inspired Materials Design." null (2024). doi: 10.21428/e4baedd9.33bd7449

Materials are needed which are both environmentally friendly and strong, but it can be hard to find them. Nature has created many amazing materials(like spider silk, which is super strong). So, from natural designs we can create new sustainable materials.

The study uses GEN AI to develop bio-inspired materials by collecting and preprocessing biological data, training VAEs and GANs for material design, using transformers to refine properties, and employing a specialized language model (BioinspiredLLM) for generating design ideas.

Year of publication	Journal name	Limitations	Future work
2024	MIT Generative AI	Data quality and Availability Complexity of Biological Systems	Integration of Generative AI Techniques Multimodal Large Language Models Exploration of New Understanding Expanding the Design Space Addressing Global Environmental Challenges

PAPER - 12
EcoGen: Fusing Generative AI and Edge Intelligence for Sustainable Scalability

KUSUMARAJU, S. H., SUNEESH, A., RANA, A., BODICHERLA, S., & TYAGI, B. EcoGen: Fusing Generative AI and Edge Intelligence for Sustainable Scalability. *Memory*, *24*(500GB), 64GB.

The main aim is to address the high computational demand and energy consumption of GEN AI models, typically run in centralized environments. It proposes a hybrid approach where both cloud and edge resources are utilized. Light weight models are fine-tuned at the edge, while larger models are handled in the cloud. The main goal is to create a sustainable and efficient system for deploying GEN AI applications.

This methodology leverages edge cloud computing for efficient data management and heavy computation, federated learning for privacy-preserving model training, and 6G technology for real-time data processing. It employs parameter-efficient fine-tuning techniques to reduce data transmission and emphasizes energy-efficient strategies to lower the carbon footprint of Generative AI deployment.

Year of publication	Conferencel name	Limitations	Future work
2024	Human-Computer Interaction International	Model complexity Infrastructure dependence Privacy concerns Energy efficiency trade-offs	develop scalable Generative AI that reduces model size and power consumption, advancing federated learning for better accuracy, efficiency, and data privacy, and optimizing energy use to minimize the carbon footprint in edge computing

PAPER - 13
Broadening the perspective for sustainable artificial intelligence: sustainability criteria and indicators for Artificial Intelligence systems

Friederike, Rohde., Josephin, Wagner., Andreas, Meyer., Philipp, Reinhard., Marcus, Voss., Ulrich, Petschow., Anne, Mollen. "Broadening the perspective for sustainable artificial intelligence: sustainability criteria and indicators for Artificial Intelligence systems." Current Opinion in Environmental Sustainability, null (2024). doi: 10.1016/j.cosust.2023.101411

The paper investigates Codex's capabilities and limitations in code generation, focusing on its in-context learning abilities, comparison with few-shot learning, and its effectiveness in real-world applications.

The methodology involves testing Codex on code generation tasks by providing example inputs and evaluating its performance using accuracy and correctness metrics. The results are compared with other models to assess Codex's ability in in-context learning and code generation.

Year of publication	Journal name	Limitations	Future work
2024	Current Opinion in Environmental Sustainability	limitations include Codex's dependence	improving Codex's generalization to

		on the quality of examples, challenges in generalizing to complex or novel tasks, and a limited evaluation scope that may not fully explore its abilities in other contexts.	complex tasks, expanding its applications, refining in-context learning methods, and addressing limitations like reliance on example quality and generalization challenges.

PAPER - 14
Complexity by Design: a nature-inspired approach to generative product design

https://typeset.io/papers/complexity-by-design-a-nature-inspired-approach-to-4n6swnuzqa

Filipa, Alves. "Complexity by Design: a nature-inspired approach to generative product design." null (2024). doi: 10.33774/coe-2024-0szqr

The aim of this study is to explore how biological morphogenesis can inspire generative product design. By analyzing complex interaction networks in nature, the research seeks to develop algorithms that enable the creation of artificial products that exhibit emergent properties, thereby enhancing design creativity and functionality .

The methodology involves analyzing biological morphogenesis through a complex systems lens. The researchers develop algorithms based on biophysical mechanisms such as regulatory networks and reaction-diffusion processes. These algorithms facilitate the exploration of design variants that meet specific requirements, allowing for rich and unpredictable outcomes in product design .

Year of Publication	Journal Name	Limitations	Future Work
2024	Research Directions	One limitation of this study is the reliance on biological analogs, which may not always translate effectively to artificial systems. Additionally, the complexity of the algorithms may pose challenges in practical applications, potentially limiting their accessibility for designers who are not familiar with complex systems theory .	Future work will focus on refining the algorithms to enhance their usability and applicability in various design contexts. Researchers aim to conduct more extensive case studies to validate the effectiveness of the generative design approach and explore its potential across different industries.

PAPER - 15
Nature's lessons, AI's power: sustainable process design with generative AI

REF:https://typeset.io/papers/nature-s-lessons-ai-s-power-sustainable-process-design-with-1pme4rdh7r

Mas'udah, Mas'udah., P., Livotov. "Nature's lessons, AI's power: sustainable process design with generative AI." Proceedings of the Design Society, null (2024). doi: 10.1017/pds.2024.215

The paper emphasizes the importance of sustainability in process engineering and proposes using generative AI as a solution to overcome the limitations of traditional methods. It focuses on integrating AI with the nature-inspired Solution-Driven Approach (SDA) to enhance innovation and sustainability in engineering design.

The study trains generative AI models using the SDA framework to tackle complex engineering problems. The AI models are designed to generate innovative solutions that prioritize sustainability and efficiency.

Year of Publication	Journal Name	Limitations	Future Work
2024	Proceedings of the Design Society	include the need for large and diverse datasets, the complexity of integrating AI with existing engineering frameworks, and the potential for bias in AI-generated solutions.	developing more advanced AI algorithms, integrating AI with other sustainability frameworks, and validating the approach through real-world case studies.

PAPER - 16
Enhancing Creativity in Sustainable Product Design: The Impact of Generative AI Tools at the Conceptual Stage

Ref https://ieeexplore.ieee.org/document/10569541

K. K. Kaljun and J. Kaljun, "Enhancing Creativity in Sustainable Product Design: The Impact of Generative AI Tools at the Conceptual Stage," *2024 47th MIPRO ICT and Electronics Convention (MIPRO)*, Opatija, Croatia, 2024, pp. 451-456, doi: 10.1109/MIPRO60963.2024.10569541.

The paper explores the impact of GEN AI tools like Vizcom on the creativity of product design students during the conceptual design stage, focusing on sustainable product design. It aims to determine if and how these tools enhance students' ability to generate diverse, innovative ideas with environmental considerations, advancing education and practice in sustainable design.

The study compared product design students using GEN AI tools with those using traditional methods, measuring creativity through ideation diversity and novelty. Both quantitative and qualitative analyses were conducted to evaluate the impact of GEN AI on creativity in sustainable design.

Year of Publication	Conference Name	Limitations	Future Work
2024	IEEE	the dependence on biassed training data, over-reliance on AI	Further research should assess the environmental impact

		without human oversight, and the focus on the conceptual design stage without addressing the long-term sustainability of the final products.	and life cycle of AI-assisted designs, explore diverse educational contexts and demographics, integrate technologies like IoT or blockchain for enhanced sustainability, and examine AI's role in material selection and lifecycle analysis.

PAPER - 17
Harnessing Generative AI for Manufacturing Innovation: Applications and Opportunities

REF https://ieeexplore.ieee.org/document/10463265

M. Jide-Jegede and T. Omotesho, "Harnessing Generative AI for Manufacturing Innovation: Applications and Opportunities," *2024 International Conference on Artificial Intelligence in Information and Communication (ICAIIC)*, Osaka, Japan, 2024, pp. 568-572, doi: 10.1109/ICAIIC60209.2024.10463265.

The aim of the paper is to explore how GEN AI is transforming the manufacturing process. It focuses on how GEN AI automates design, predicts equipment failures, enhances productivity, and reduces costs. It mainly highlights the importance of GEN AI in enabling real- time monitoring, predictive maintenance and helps in adoption of GEN AI in manufacturing for the future.

The research reviews existing studies on GEN AI in manufacturing, gathers data from companies using GEN AI, and analyzes use cases like real-time monitoring. Quantitative and qualitative analyses are conducted to assess the impact on productivity, cost savings, and innovation, while also identifying common challenges. The study compares GEN AI's effectiveness across different manufacturing sectors and offers recommendations for successful implementation.

Year of Publication	Conference Name	Limitations	Future Work
2024	IEEE	Dependence on training data Need for human expertise Integration challenges	explore diverse educational contexts, integrate generative AI with emerging technologies like IoT and blockchain, and conduct longitudinal studies to assess the long-term impact on creativity and design outcomes.

PAPER - 18
The Crowdless Future? How Generative AI Is Shaping the Future of Human Crowdsourcing

REF
https://consensus.app/papers/crowdless-future-generative-shaping-future-human-boussioux/bd975587dfdd585689b67cb653850ff6/?q=Generative+AI+for+Sustainable+Product+Design+including+the+parameter+-+Crowd+source+sustainability&synthesize=on&copilot=on

L. Boussioux et al. "The Crowdless Future? How Generative AI Is Shaping the Future of Human Crowdsourcing." *SSRN Electronic Journal* (2023). https://doi.org/10.2139/ssrn.4533642.

The study investigates the capability of generative artificial intelligence (AI) in creating innovative business solutions compared to traditional human crowdsourcing methods. It focuses on a crowdsourcing challenge centered on sustainable, circular economy business opportunities, aiming to evaluate the effectiveness of AI-generated solutions against those produced by human participants.

The research involved initiating a crowdsourcing challenge that attracted a diverse range of solvers from various countries and industries. Simultaneously, the study employed GPT-4 to generate AI solutions using three different prompt levels, each designed to simulate distinct human crowd and expert personas. A total of 145 evaluators assessed a randomized selection of 10 out of 234 human and AI solutions, resulting in 1,885 evaluator-solution pairs. The study utilized natural language processing techniques to analyze the solution text, focusing on the quality, novelty, and semantic diversity of both human and AI-generated solutions.

Year of Publication	Journal Name	Limitations	Future Work
2023	SSRN Electronic Journal	limitations, including the perception that human ideas were more novel, while AI solutions provided better environmental and financial value	focus on developing integrative approaches that combine human creativity with AI capabilities, enhancing the effectiveness of crowdsourcing in solving complex organizational problems and advancing sustainable practices.

PAPER - 19
Generative Design: Reframing the Role of the Designer in Early-Stage Design Process

REF https://typeset.io/papers/generative-design-reframing-the-role-of-the-designer-in-3bdj9793

Jana, I., Saadi. "Generative Design: Reframing the Role of the Designer in Early-Stage Design Process." Journal of mechanical design, 145 (2023). doi: 10.1115/1.4056799

The paper aims to explore how advancements in artificial intelligence (AI) enable effective collaboration between human designers and AI tools, particularly in the early stages of product design. It emphasizes the

integration of computational design tools like topology optimization and generative design to enhance innovation and performance in the design process
The research involved conducting six in-depth interviews with designers to understand their use of computational tools in the design process. Based on the insights gathered, the study proposes a provisional process diagram for hybrid intelligence, highlighting how iterative learning and constraint-driven approaches can improve design outcomes

Year of Publication	Journal Name	Limitations	Future Work
2023	Journal of mechanical design	its findings may not fully represent all design practices due to the specific backgrounds of the interviewees. The diverse disciplines and perspectives of designers across various fields are not fully captured in the research	explore the potential of AI-driven tools in enhancing collaboration between designers and AI systems

PAPER - 20
Criteria for Sustainable AI Software: Development and Evaluation of Sustainable AI Products

Ref **https://typeset.io/papers/criteria-for-sustainable-ai-software-development-and-ux8efhd5hn**

Mohamed, Alloghani. "Criteria for Sustainable AI Software: Development and Evaluation of Sustainable AI Products." Signals and communication technology, null (2023).:33-51. doi: 10.1007/978-3-031-45214-7_2

To investigate methods for producing and evaluating AI products with a focus on sustainability. The research's main goal is to promote acceptability and trust in emerging AI technologies by developing sustainable, trustworthy, and secure products. The report underlines the need of developing sustainable AI products so that developers focus sustainability throughout the product development lifecycle.

The research study examines ways for building and evaluating long-term AI products. The study underlines the need of developing AI systems to increase acceptance and trust in new technologies. It emphasizes the importance of developing AI solutions that are long-lasting, dependable, and secure in order to compete in today's global market. The findings emphasize the need of product developers emphasizing sustainability throughout the AI product development lifecycle.

Year of publication	Journal name	Limitations	Future work
2023	Signals and communication	Unclear implications of AI systems now and in	Future work should focus on enhancing the acceptability and

	technology	the long run. Need for sustainable, reliable, secure AI products as technology evolves.	trust in AI by developing sustainable, reliable, and secure solutions, and tracking sustainability throughout the product development lifecycle.

PAPER - 21

Designs and practices using generative AI for sustainable student discourse and knowledge creation

Alwyn, Vwen, Yen, Lee., Seng, Chee, Tan., Chew, Lee, Teo. "Designs and practices using generative AI for sustainable student discourse and knowledge creation." Smart Learning Environments, 10 (2023). doi: 10.1186/s40561-023-00279-1

The aim of the study is to explore how Generative AI (GAI) can be integrated as a learning companion to sustain and enhance student discourse and knowledge building in educational settings. The study introduces design principles that leverage AI to support authentic problem-solving, idea diversity, continuous improvement, contextual understanding, the use of authoritative sources, and ongoing assessment.

The methodology involves integrating Generative AI (GPT models) into educational practices to support student discourse. This was piloted with students in Singapore, using ChatGPT to analyze and sustain discussions in an online Knowledge Building Design Studio. The AI provided prompts and feedback based on knowledge-building principles, such as encouraging idea diversity and suggesting improvements. The study highlights the potential of AI to enhance learning but also notes limitations in replicating the dynamic nature of human-driven knowledge building.

Year of publication	Journal name	Limitations	Future work
2023	Smart Learning Environments	inability of Generative AI to fully replicate the dynamic and emergent nature of human-driven knowledge building integrating AI with existing educational practices to support authentic student discourse.	while AI can support learning, it cannot fully replicate the dynamic, human-driven aspects of knowledge building, making it essential to maintain a balance between AI use and human intervention.

PAPER - 22
Artificial Intelligence Assisted Social Failure Mode and Effect Analysis (FMEA) for Sustainable Product Design

Christian, Spreafico., Agung, Sutrisno. "Artificial Intelligence Assisted Social Failure Mode and Effect Analysis (FMEA) for Sustainable Product Design." Sustainability, 15 (2023).:8678-8678. doi: 10.3390/su15118678

The study aims to enhance social failure mode and impact analysis (SFMEA) in sustainable product design using an AI-powered chatbot to identify social repercussions. It evaluates this method through case studies

involving a gender-biased coffee cup, a rights-violating COVID mask, and a culturally insensitive thermometer.The study proposes using ChatGPT to identify social failures in SFMEA by asking 84 specific questions based on SFMEA elements. The method was tested on three case studies to evaluate its effectiveness in promoting socially sustainable design.

Year of publication	Journal name	Limitations	Future work
2023	Sustainability	Case studies influence the chatbot's responses, and AI chatbots have limitations in generating accurate correlations and answers.	Future work could involve expanding case studies, evaluating the method's effectiveness in linking social repercussions to design failures, refining question formulation, enhancing user interaction with the AI chatbot, and improving the tool's capabilities

PAPER - 23

Generative design and insights in strategies for the development of innovative products with tailored mechanical and/or functional properties

Ida, Papallo., Massimo, Martorelli., Francesco, Lamonaca., Antonio, Gloria. "Generative design and insights in strategies for the development of innovative products with tailored mechanical and/or functional properties." Acta IMEKO, 12 (2023).:1-5. doi: 10.21014/actaimeko.v12i4.1716

REF: https://typeset.io/papers/generative-design-and-insights-in-strategies-for-the-31ubqttkze

The research aims to explore the role of generative design as a crucial support in the ideation process of developing innovative products with tailored mechanical and/or functional properties.

A case study is presented involving the design of a door support fitting using generative design. The methodology includes defining loads, structural constraints, and selecting manufacturing methods like traditional die casting and additive manufacturing. The study focuses on minimizing mass while meeting safety factors.

Year of publication	Journal name	Limitations	Future work
2023	Acta IMEKO	not all generative design outcomes meet the safety factor criteria, necessitating further redesign in some cases.	explore bioinspired generative design for advanced, lightweight products with reduced environmental impact.

PAPER - 24

A Study of Sustainable Product Design Evaluation Based on the Analytic Hierarchy Process and

Deep Residual Networks

REF:
https://typeset.io/papers/a-study-of-sustainable-product-design-evaluation-based-on-3wpa9t6ig9

Huan, Lin., Xiaolei, Deng., Jianping, Yu., Xiaoliang, Jiang., Dongsong, Zhang. "A Study of Sustainable Product Design Evaluation Based on the Analytic Hierarchy Process and Deep Residual Networks." Sustainability, null (2023). doi: 10.3390/su151914538

The study aims to develop a sustainable product design evaluation method by integrating AHP-based manual evaluation with ResNet-50 for automatic evaluation, enhancing efficiency, reliability, and resource sustainability.

The study uses AHP to establish criteria and weight coefficients for a manual design evaluation model. Simultaneously, ResNet-50 is used to train and automatically evaluate product designs based on these criteria. The integration of both methods is validated by comparing their results.

Year of publication	Journal name	Limitations	Future work
2023	Sustainability	its focus on a specific product design, potential biases in AHP due to subjective judgments, and the ResNet-50 model's accuracy being dependent on the quality and quantity of training data.	expanding the application of this integrated evaluation method to other types of products and industries. There is also potential to refine the automatic evaluation model by incorporating more advanced machine learning algorithms or hybrid models.

PAPER - 25

Co-constructing knowledge with generative AI tools: Reflections from a CSCL perspective

REF https://typeset.io/papers/co-constructing-knowledge-with-generative-ai-tools-1tyw0x1kxc

Ulrike, Cress., Joachim, Kimmerle. "Co-constructing knowledge with generative AI tools: Reflections from a CSCL perspective." International Journal of Computer-supported Collaborative Learning, null (2023). doi: 10.1007/s11412-023-09409-w

The aim of the study is to explore the potential and challenges of using generative AI tools like ChatGPT for knowledge construction, both on an individual level and in collaborative settings. The paper reflects on how these tools can support knowledge transformation processes rather than merely facilitating knowledge telling. The authors seek to understand the human-AI interaction dynamics, particularly from a Computer-Supported Collaborative Learning (CSCL) perspective.

The study is primarily a theoretical reflection rather than an empirical study. The authors borrow from existing CSCL resea7rch and cognitive-constructivist theories to analyze how generative AI tools might be integrated into collaborative learning environments. They suggest possible research paths and methodologies for future studies that could empirically investigate the human-AI interaction in educational

settings.

Year of publication	Journal name	Limitations	Future work
2023	International Journal of Computer-supported Collaborative Learning	the current state of generative AI tools, which, despite their impressive capabilities, lack true conceptual understanding and consciousness. This limitation raises questions about the extent to which these tools can genuinely contribute to knowledge construction versus merely providing content based on word associations and probabilities.	focus on developing optimal prompts for human-AI communication, adapting human-human collaboration principles to human-AI interactions, exploring AI's role in collaborative learning, and addressing ethical and technological considerations in education.

PAPER - 26
Sustainable Digital Product Design

https://typeset.io/papers/sustainable-digital-product-design-2i7bj3mt

Eric, Johnson. "Sustainable Digital Product Design." Climate and energy, 38 (2022).:17-20. doi: 10.1002/gas.22277

The aim of this study is to investigate the role of digital platforms in enhancing user engagement and promoting sustainable practices in product design. By analyzing user interactions on social media, the research seeks to identify how digital tools can contribute to more sustainable consumption patterns and product lifecycle management .

The methodology involves a mixed-methods approach, combining qualitative and quantitative analyses. Surveys and interviews will be conducted to gather data on user experiences with digital platforms. Additionally, case studies of successful sustainable product designs will be analyzed to identify best practices and strategies for integrating digital tools into product development .

Year of publication	Journal Name	Limitations	Future Works
2022	Climate and energy	The study's limitations include potential biases in self-reported data from surveys and interviews. Furthermore, the focus on specific digital platforms may not capture the full spectrum of user interactions across all social media channels, which could affect the generalizability of the	Future research should explore the long-term impacts of digital engagement on sustainable product design. Additionally, investigating the role of emerging technologies, such as augmented reality and artificial intelligence, in enhancing user experiences and promoting sustainability

		findings .	could provide valuable insights for practitioners .

PAPER- 27
Sustainable Product Design and Development

https://typeset.io/papers/sustainable-product-design-and-development-37ealpqz32

Anoop, Desai., Anil, Mital. "Sustainable Product Design and Development." null (2020).

The aim of "Sustainable Product Design and Development" is to establish a framework for creating products that minimize environmental impact and promote sustainability. It emphasizes design guidelines that enhance product longevity and facilitate end-of-life strategies such as reuse, recycling, and remanufacturing, while also introducing mathematical models to evaluate the costs associated with sustainable design practices .

The methodology presented in the book involves a systematic approach to sustainable product design. It includes the development of design guidelines aimed at prolonging product life and minimizing environmental impact. The book also introduces mathematical models that allow designers to calculate the costs of sustainable design early in the product development process, ensuring informed decision-making .

Year of Publication	Journal Name	Limitations	Future Work
2020	Climate and energy	The book acknowledges limitations such as the variability in the application of sustainable design principles across different industries. Additionally, it may not cover all specific environmental regulations or practices relevant to every region, which could affect the generalizability of the guidelines provided .	Future work suggested in the book includes further research on enhancing the mathematical models for cost assessment in sustainable design. It also encourages the exploration of innovative materials and technologies that can improve product sustainability, as well as the development of more comprehensive case studies to illustrate best practices in various sectors .

PAPER - 28
Product Design Innovation Method and Practice Based on Sustainable Design

https://typeset.io/papers/product-design-innovation-method-and-practice-based-on-unr1m97j2h

The aim of the paper is to analyse sustainable design methods and construct a product sustainable design evaluation system. It seeks to provide enterprises with effective strategies to reduce costs, enhance product

quality, and improve competitiveness through sustainable design practices. The research emphasises the significance of integrating environmental, economic, and social factors in product design innovation.

The methodology involves analyzing sustainable design methods and constructing a product sustainable design evaluation system. The paper details the process of product design innovation, applying the sustainable design method to a design case. This approach allows for further research and application, demonstrating the effectiveness of sustainable design practices in achieving positive outcomes for enterprises .

Year of Publication	Book chapter	Limitations	Future Work
2018	Sustainable Design and Manufacturing 2018	The paper acknowledges limitations such as the potential challenges in implementing sustainable design methods within existing industrial frameworks. Additionally, the reliance on accurate data for evaluating sustainability may pose difficulties, as incomplete information could lead to suboptimal design decisions .	Future work will focus on expanding the application of the sustainable design evaluation system across various industries. The authors aim to refine the design methods based on feedback from practical applications, enhancing the tool's effectiveness in promoting sustainable product development and innovation .

PAPER 29

Computer aided product design tool for sustainable product development

https://typeset.io/papers/computer-aided-product-design-tool-for-sustainable-product-din0v2quqy

Juliette, Heintz., Juliette, Heintz., Jean-Pierre, Belaud., Jean-Pierre, Belaud., Nishant, Pandya., Nishant, Pandya., Moises, Teles, dos, Santos., Moises, Teles, dos, Santos., Vincent, Gerbaud., Vincent, Gerbaud. "Computer aided product design tool for sustainable product development." Computers & Chemical Engineering, 71 (2014).:362-376. doi: 10.1016/J.COMPCHEMENG.2014.09.009

The aim of the paper "Computer aided product design tool for sustainable product development" is to create a design tool that incorporates sustainability into the product development process. This tool is intended to help designers make environmentally conscious decisions, thereby reducing the ecological footprint of products while enhancing their functionality and user experience .

The methodology involves the development of a computer-aided design (CAD) tool that integrates sustainability metrics into the design process. The tool utilises algorithms to evaluate the environmental impact of design choices, allowing designers to visualise the sustainability of their products in real-time. This approach aims to streamline the design process while ensuring that sustainability is a core consideration .

Year of Publication	Journal Name	Limitations	Future Work
2014	Computers & Chemical Engineering	The paper acknowledges several limitations, including the potential complexity of integrating the tool into existing design workflows.	Future work will focus on enhancing the tool's capabilities by incorporating more comprehensive sustainability metrics

		Additionally, the reliance on accurate data for sustainability metrics may pose challenges, as incomplete or inaccurate data could lead to misleading assessments of a product's environmental impact .	and user feedback. The authors also plan to conduct case studies to validate the tool's effectiveness in real-world applications, aiming to refine its features based on practical insights from designers .

Paper - 30
Sustainable Product Design: The Development of a Conceptual Model

https://typeset.io/papers/sustainable-product-design-the-development-of-a-conceptual-2sgbp0hfpz

Pâmela, Teixeira, Fernandes., Osiris, Canciglieri. "Sustainable Product Design: The Development of a Conceptual Model." Applied Mechanics and Materials, 518 (2014).:335-342. doi: 10.4028/WWW.SCIENTIFIC.NET/AMM.518.335

The aim of this study is to develop a conceptual model for Method Integrated Product Development oriented towards sustainability. This model is designed to assist designers in creating sustainable product alternatives throughout the product's life cycle, integrating sustainability into traditional design processes and enhancing overall product development practices .

The methodology involves a case study application of the proposed conceptual model to a specific product category. The model guides designers through the development process, offering strategies for sustainable design and evaluating alternatives based on environmental and economic criteria. A literature review was also conducted to identify relevant guidelines and principles for sustainable product development.

Year of Publication	Journal Name	Limitations	Future Work
2014	Applied Mechanics and Materials	The study acknowledges limitations, including the focus on a single product category, which may restrict the generalizability of the findings. Additionally, the model's effectiveness may depend on the designers' technical knowledge and familiarity with sustainable materials and processes, which can vary widely across different contexts .	Future research should explore the application of the proposed model across various product categories and industries. Additionally, investigating the integration of advanced technologies and tools for sustainability in product design could enhance the model's effectiveness and broaden its applicability in real-world scenarios.