

The Role of Artificial Intelligence in Shaping Modern UI Design: A Comparative Analysis of AI Tools and Human Creativity

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Abstract

I explore the evolution of artificial intelligence and user interface design as well as the role of generative AI in the UI design process by comparing the outputs of the current state of AI tools like Galileo AI and Lovable, created to generate full UI designs using prompts with traditional design methods done for decades using design tools like Figma and UX research conducted by designers. The advantages and disadvantages of incorporating AI into the design process and whether it can be a valuable tool to aid us. This paper also looks at the different kinds of views on using AI to design and arguments about how using it is soulless or is not original. While AI tools can be efficient and help save time, it does lack emotional depth and intuitions that humans can bring to designs. AI augments human creativity and does not replace it.

Introduction

User Interface (UI) was defined as early as computers have been around. With the existence of computers, there needed to be a way for humans to interact with them (Jørgensen & Myers, 2008). Computing in general is a ground-breaking innovation but creating ways for us to interact with it is also crucial. UI has evolved from batch processing to Command-Line Interfaces (CLI) to Graphical-User Interfaces (GUI). There have been many advancements made in the Human-Computer Interaction (HCI) field in regards to UI that make interacting with computers very simple and efficient. The first commercial system to contain a GUI was the Xerox Star in 1981, and was a way to generate an intuitive user experience (Myers, 1998). UI is an element of HCI and is what a user sees and interacts with and User Experience (UX) is what the user feels like and thinks about while interacting with the interface.

As web content became more common and mainstream, Web Content Accessibility Guidelines (WCAG) were established as a way to make web content more accessible and designing systems and interfaces according to these guidelines is also significant. There are certain design systems that help keep design systematic and maintain consistency across all platforms. Design systems have also evolved as computing devices have, so making design responsive is also important (Stoeva, 2024).

There are many design tools that are used by designers to make responsive UI designs and prototypes for web and mobile applications. Early on, designs were sketched out using pen

and paper. Later on, designers shifted to digital applications like Photoshop, which is a general design and photo-editing tool. In around the mid 2000's, dedicated software with GUI to help design UI was created, like Axure RP and Balsamiq with advanced design features were incorporated into designing (Jørgensen & Myers, 2008). Figma is a notable tool used by most designers and was created to make creating UI designs more accessible. Figma is not only used to create designs and prototypes but can also be used to collaborate, in real-time, with members of your team, keeping everything organized (Whitney, 2022).

The concept of artificial intelligence has been around since the 1940's and was designed to replicate human intelligence to solve complex problems and reduce work by automating repetitive but crucial tasks. There have been many advancements in its development since then, most notably the Turing Test, or the imitation game, to measure machine intelligence, ELIZA, a natural language processing tool that was able to mimic human conversation, and various other innovative developments (Haenlein & Kaplan, 2019). While early artificial intelligence models are not generative and were rule based, those were the steppingstones to what we know as generative AI today. As computational power increased and big data became abundant, it allowed for the development of deeper neural networks, since a large amount of data could aid in better training, while the progression of hardware, such as better GPUs and software, like cloud computing continued to improve (Singh, 2023).

In 2017, Google researchers introduced the “Transformer Architecture”, a type of a deep learning architecture mainly used in natural language processing (Vaswani et al., 2017). This development enhanced the field of natural language processing because of its scalability and efficiency to handle long-range dependencies. All the advantages of this architecture made it the basis of models, such as the Bidirectional Encoder Representations from Transformers (BERT) developed by Google and Generative Pre-trained Transformer (GPT) developed by OpenAI (Radford et al., 2018), and used unsupervised learning. Now, we have numerous large language models (LLM) that exist and have incredible results (Gomez, 2024), including some of them passing the Turing Test in certain contexts (Jones & Bergen, 2025).

As AI has become prominent in the modern world of computing, it has trickled down to other aspects of many different fields, including user interface (UI) and user experience (UX). Using Generative Adversarial Networks (GAN) and transformers to generate UI/UX designs, generative AI models have the potential to automate design processes and research without user input.

Discussion

Though there are many advantages for using generative AI for UI, such as saving time and effort spent on designing and prototyping, there are also some valid points that are brought up in this ongoing debate of concerns with the overuse of AI in creative processes, such as the balance of human input in design, as well as emotional and cultural understanding that only humans possess. (Owen & Ajeigbe, 2023). The discussion is mainly about whether or not AI can design UI exactly like, or as close to, how humans are able to.

Another point of discussion is the originality of AI designs, since it mostly regurgitates information and generates responses based on the large amounts of data that it has been trained on and cannot have true independent thoughts. One can make the argument that humans taking inspiration from each other parallels this drawback of AI. However, people can still take inspiration while demonstrating originality and make creative work, like UI design, their own.

There are still a lot of advantages using AI in the context of UI/UX design and research since we cannot deny the proficiency of using it to make our work easier and quicker. Before the use of AI, all creative work, including UI design was possible and done manually, but we need to think of it as technology that aids us instead of dismissing it as something soulless and not creative. There are a lot of arguments about AI killing creativity by making everything homogenous and look the same, which has some truth to it but current design is also the product of general design trends in the current era, with minimalism and glass morphism, while older designs were more rounded, colorful and brighter. However, AI should be viewed as an enhancement, rather than something that is not creative. Instead, we can focus on how and when to use AI in work that relies on creativity and originality (Doshi & Hauser, 2013).

Current AI Technology for UI Design

There are a lot of AI tools to for a whatever function you need, whether having its own interface, like ChatGPT, Deepseek and Claude for things like brainstorming, summarising and productivity in general, Zapier AI for workflow, Otter.ai for note taking in live meetings or AI built into applications like Github Copilot and Cursor code editor for coding, and many more. If we are narrowing AI use in UI design, there are Figma AI plugins, Copy.ai to generate UI copies and All in one UI design platforms like Galileo AI, Uizard and Visily that can be used to generate full designs. There are also AI website builders like Lovable AI and TeleportHQ that creates full, production ready websites with code that can be edited as needed. Anyone can just generate a whole website or website designs within just a few seconds just using prompts to describe what you want the website or design to look like, without needing to know how to code or design.

Artificial intelligence uses machine learning and existing design and user data that is available to learn from to create UI designs. It can either take in an input prompt, wireframes or picture references and apply whatever it has learned, like design principles, user patterns and general design rules to generate a UI design or front-end code and iterate it based on further feedback or correction from the user.

Methodology

The focus of this comparative study is to view the current state of AI in UI design, specifically identify how it designs a full UI page using prompts and what the main

differences are between a UI designed by an AI tool and one designed by a designer as well as highlight creative and design focused approaches both sides have taken.

I chose two AI tools that have similar functions to design different kinds of pages, Galileo AI and Lovable. One of the main functions of these tools are the same, which is to create UI designs but where they differ how this process is carried out. Galileo AI generates images of the designs that the user specifies and provides Figma files for the user to tweak, where as Lovable generates a fully functional website with frontend code like React, TypeScript, and Tailwind CSS for styling as well as Supabase for data storage and authentication, which users can export for further improvements.

I also chose some designs made by humans, as a benchmark to compare the AI designs with. These designs were created by experienced design professionals using tools such as Figma, Adobe XD, InVision, Photoshop and possibly other design and image editing tools.

Comparison

For the comparison, I picked four UI designs:

1. A price page for a Software as a Service (SaaS) - Clay (<https://www.clay.com/pricing>)
2. A landing page for an AI SaaS - Granola (<https://www.granola.ai/>)
3. A landing page for a food item - Maeve Chocolate (<https://maevechocolate.com/>)
4. A mobile app for movie and TV show streaming service - Disney Plus (<https://www.apps.disneyplus.com>)

I specifically picked these UI designs to test how AI builders would design them. To achieve this, I had to create prompts for each of the designs and input those into Galileo AI and Lovable.

Price page UI

The screenshot shows the Clay pricing page. At the top, there's a navigation bar with links for Product, Solutions, Resources, Company, Enterprise, Pricing, Get a demo, Login, and Sign up. Below the navigation is a section titled "Compare our plans". It features a grid of six pricing plans: "Free", "Starter", "Explorer" (highlighted as "MOST POPULAR"), "Pro", "Enterprise", and "Custom". Each plan has a price, billing frequency, and credits per year. The "Enterprise" and "Custom" plans are grouped together under a "Pay annually - 10% discount & all credits upfront" heading. Below the grid, there's a table comparing various features across the plans, such as "Users", "People/Company searches", "Exporting", "AI/Claygent", "Rollover credits", and "100+ integration providers".

	Free	Starter	Explorer	Pro	Enterprise	Custom
\$0/month	\$0/month	\$134/month	\$314/month	\$720/month		
Billed yearly. All credits granted upfront.	12K credits/year	24K credits/year	120K credits/year	600K credits/year		
Try Clay for free →					Contact Sales	Custom Credits
Users	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
People/Company searches	Up to 100/search	Up to 5,000/search	Up to 10,000/search	Up to 25,000/search	Up to 50,000/search	
Exporting	•	•	•	•	•	•
AI/Claygent	•	•	•	•	•	•
Rollover credits	•	•	•	•	•	•
100+ integration providers	•	•	•	•	•	•

Figure: Human designed price page UI

Prompt for the AI tools

Design a responsive pricing comparison table for a SaaS product called 'Clay.' Include 5 columns: Free, Starter, Explorer (marked as 'Most Popular'), Pro (marked as 'Best Value') and Enterprise. Each plan should show: Monthly price (billed yearly), Dropdown to select, credits/year, A bold CTA button (e.g., 'Try for free', 'Contact Sales'). A feature list including: Users (Unlimited), People/Company searches (varies by plan), Exporting, AI/Claygent, Rollover credits, 100+ integrations. Use a light background with each plan column having a soft pastel color (lavender, yellow, pink, navy, etc.). The overall layout should feel modern, clean, and data-friendly. Include a toggle switch to switch between 'Pay Monthly' and 'Pay Annually (10% discount)' at the top.

Galileo AI

The screenshot shows a pricing page for a product named 'Clay'. At the top, there is a navigation bar with links for 'Product', 'Pricing', 'Resources', a 'Try for free' button, and 'Log in'. Below the navigation, the word 'Pricing' is displayed. A main heading says 'Select the right plan for your business' with a sub-note 'Start with a 14-day free trial, no credit card required'. There are two tabs: 'Monthly' (which is selected) and 'Annually'. The main content is a table comparing five plan levels: Free, Starter, Growth, and Enterprise. The table includes columns for Price, Contact limit, Company profiles, Team members, Daily exports, CRM integrations, and Email integrations. The table has a light gray background with alternating row colors. The 'Enterprise' column is aligned to the right.

	Free	Starter	Growth	Enterprise
Price	\$0	\$49	\$99	Contact Sales
Contact limit	500	10k	50k	Custom
Company profiles	100	5k	25k	Custom
Team members	1	2	5	Custom
Daily exports	0	1	5	Custom
CRM integrations	Salesforce	Salesforce, Hubspot	All	All
Email integrations	Gmail, Outlook	Gmail, Outlook, SendGrid	All	All

Figure: Galileo AI designed price page

Galileo AI did follow the prompt but not exactly, since it did create a legible price page with a navigation bar and the 'Monthly' and 'Annually' tabs but it did not add any of the colors that was specified, which makes it look a lot more bare-bones and lackluster.

Lovable

The screenshot shows a pricing page for 'Clay'. At the top, there's a navigation bar with 'Clay' on the left and links for 'Product', 'Solutions', 'Resources', 'Pricing', 'Log in', and a blue 'Sign up free' button. Below the navigation is a section titled 'Simple, transparent pricing' with the sub-instruction 'Choose the plan that's right for your team and scale as you grow.' A toggle switch at the top allows users to choose between 'Pay Monthly' and 'Pay Annually' with a 'Save 10%' discount. The page features five pricing plans: 'Free', 'Starter', 'Explorer', 'Best Value', and 'Enterprise'. Each plan includes a price, billing frequency, credits per year, and a 'Start free trial' or 'Try for free' button. A detailed feature comparison table follows each plan, showing what features are included (green checkmarks) or excluded (red X's). For example, the 'Free' plan includes 1 user, 100 searches, and basic AI/Claygent features, while the 'Enterprise' plan includes unlimited users, unlimited searches, and enterprise-grade AI/Claygent features.

Figure: Lovable designed price page

Lovable actually not only followed the prompt, but it also put its own spin on the design of this page. It added a toggle switch for ‘Monthly’ and ‘Annually’, with good copy by adding “Simple, transparent pricing”. The overall design looks much more cohesive and aesthetically pleasing.

Landing page for an AI SaaS UI

The screenshot shows a landing page for 'Granola'. At the top, there's a navigation bar with 'granola' on the left and links for 'Pricing', 'News', 'Careers', and a blue 'Download' button. Below the navigation is a call-to-action button 'Get iOS early access >'. The main headline reads 'The AI notepad for people in back-to-back meetings' in large, bold, dark green text. Below the headline is a sub-copy: 'Granola takes your raw meeting notes and makes them awesome'. At the bottom, there's a green button with the text 'Download Granola for Mac' and an Apple logo.

Figure: Human designed SaaS landing page

The prompt

Design a modern, minimalist landing page for a productivity app called 'Granola.' The page should have a clean white background with subtle gradient shading near the bottom. At the top, include a simple navigation bar with links to 'Pricing,' 'News,' and 'Careers,' plus a 'Download' button with an Apple icon. The hero section should feature bold, centered text that reads: 'The AI notepad for people in back-to-back meetings' with 'AI notepad' and 'back-to-back meetings' in bold dark green. Below, add a smaller subheadline: 'Granola takes your raw meeting notes and makes them awesome.' Include a prominent green call-to-action button: 'Download Granola for Mac' with an Apple icon. Use clean, sans-serif fonts and a calm, professional tone.

Galileo AI

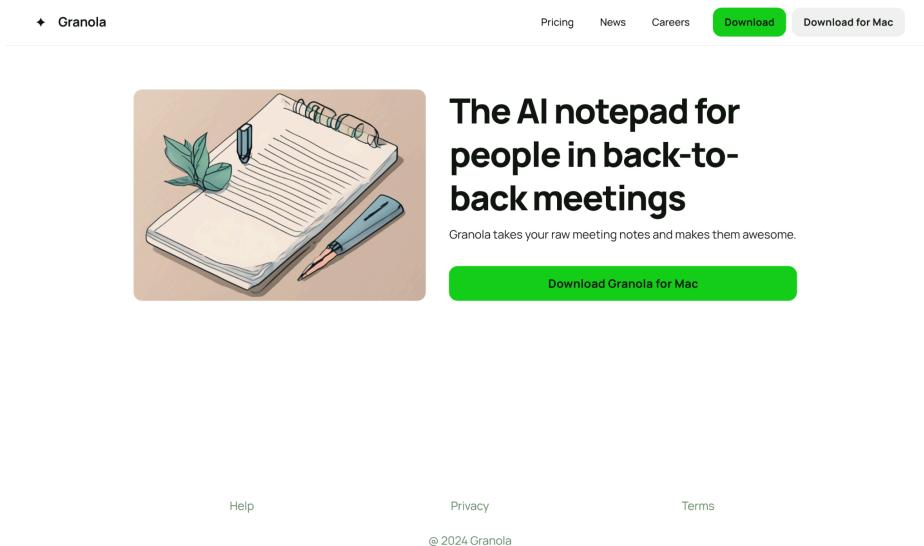


Figure: Galileo AI designed SaaS landing page

This design was better than the previous one. It added an illustration and the specified copy. It also added a navigation bar and colors that were mentioned but no green gradient.

Lovable

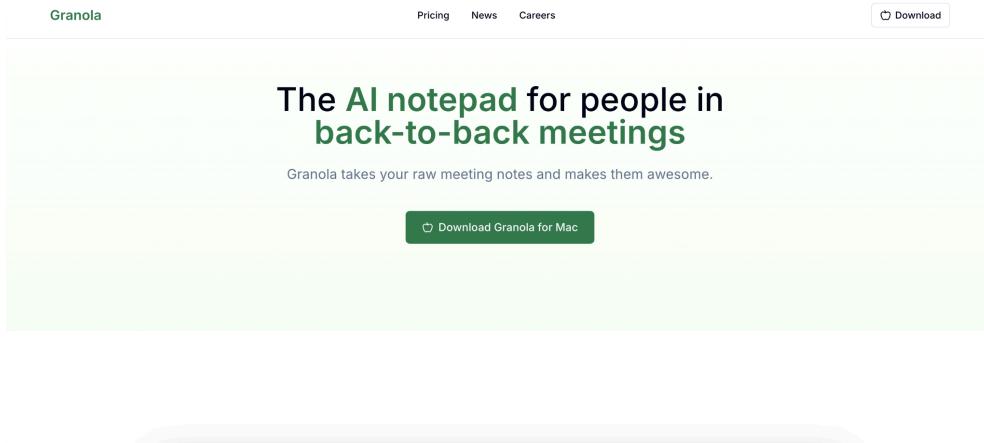


Figure: Lovable designed SaaS landing page

This design was not as creative as the last one but it did follow the prompt properly, with a navigation bar and an apple logo on the buttons. It also added the green gradient to the page.

Landing page for a food item (Chocolate)

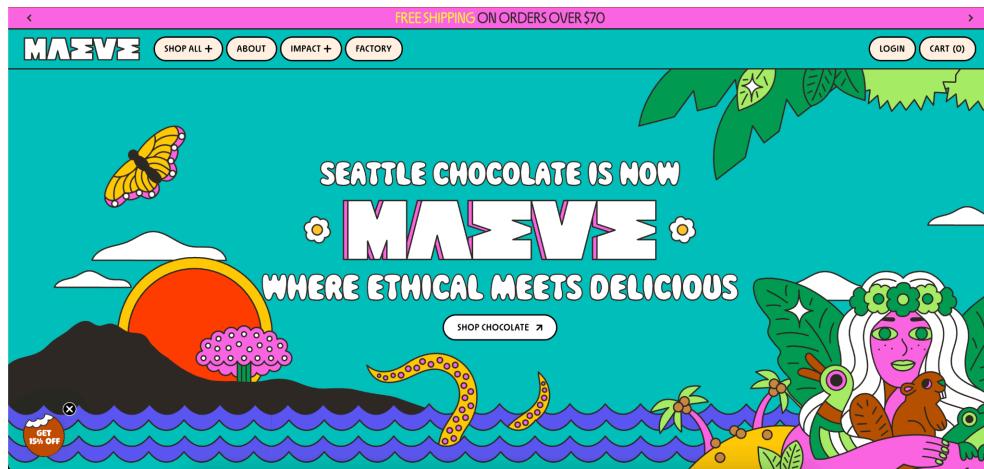


Figure: Human designed landing page for chocolate

Prompt

Design a colorful, cartoon-style landing page for a chocolate brand. The theme should be playful, whimsical, and nature-inspired. Use bright, saturated colors like teal, pink, orange,

and yellow. Include illustrated elements like a butterfly, tropical plants, ocean waves, and a sunset. Feature a bold and funky custom logo at the top center. Add a main tagline like 'Where Ethical Meets Delicious' in a bubbly, hand-drawn font. Include a call-to-action button that says 'Shop Chocolate.' The layout should feel friendly and retro with strong 70s psychedelic vibes.

Galileo AI

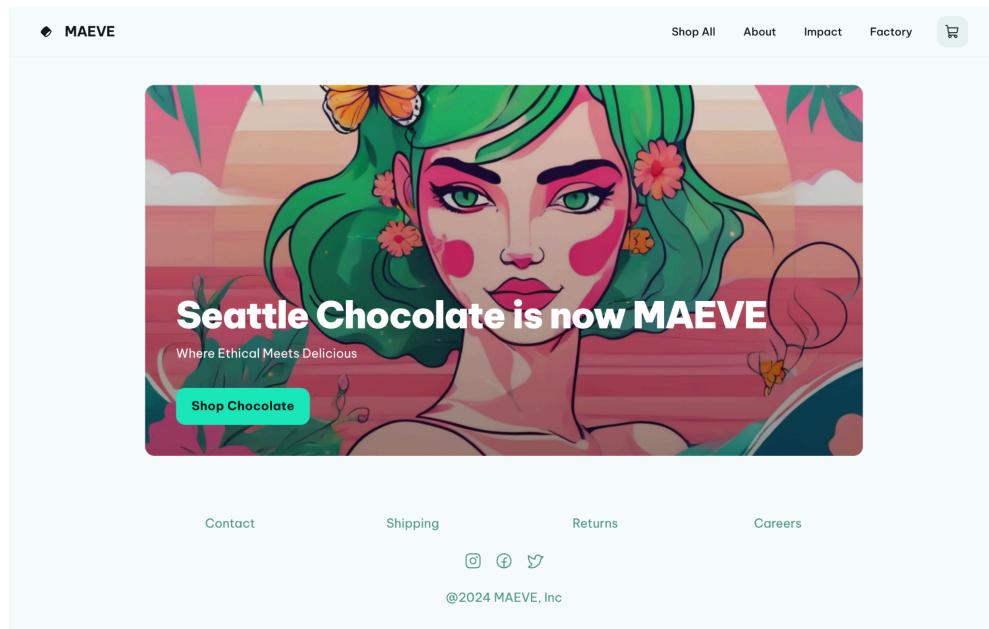


Figure: Galileo AI designed landing page for chocolate

This design still is not as creative as the human designed one and feels generic. It does however have an illustration and a navigation bar.

Lovable

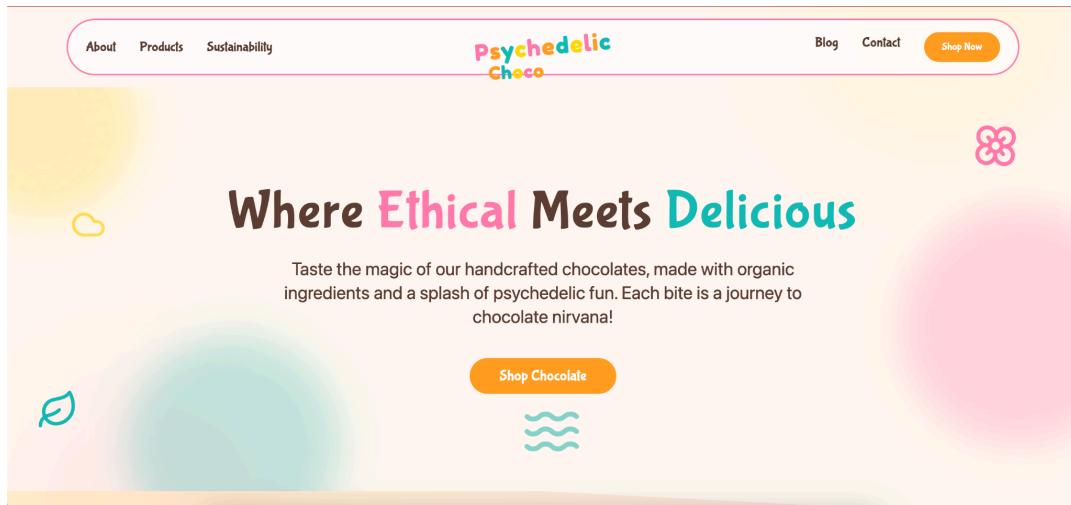


Figure: Lovable designed landing page for chocolate

This was better designed than the one made by Galileo AI but it does not follow the copy provided and still does not feel as aesthetically pleasing. It also uses fonts that do not work with the overall design of the page.

Mobile app for a streaming service

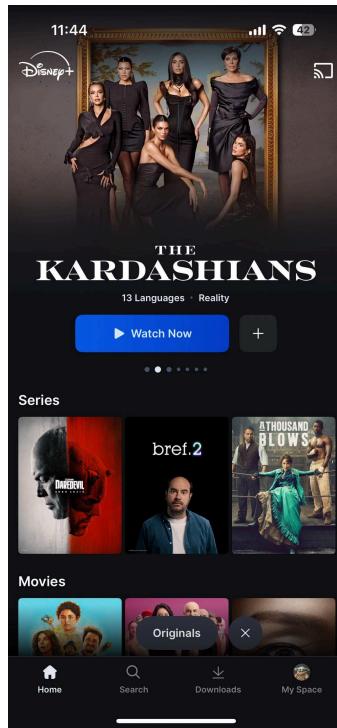


Figure: Human designed mobile app

Prompt

Create a premium streaming app interface with a sleek, dark-themed design. Deep black background with high contrast elements for content visibility. Hero section with large promotional content image taking approximately 40% of screen height. Bold, elegant typography with show/movie title in large white serif font below the hero image. Small descriptive tags in light gray underneath the title (language options, genre tags). Prominent blue primary action button ('Watch Now') with rounded corners and accompanying add/plus button in darker gray. Content categorization with bold white section headers ('Series', 'Movies'). Horizontal scrollable rows of content thumbnails with varied aspect ratios (2:3 for posters). Each thumbnail should have subtle rounded corners and no visible borders. Bottom navigation bar with 4-5 icons in minimal style (Home, Search, Downloads, Profile). Status bar showing time, network connectivity at top. Small recognizable brand logo in top-left corner. Clean, minimal UI with ample negative space for premium feel. Floating category pills/tabs with subtle transparency appearing when navigating between sections.

Galileo AI

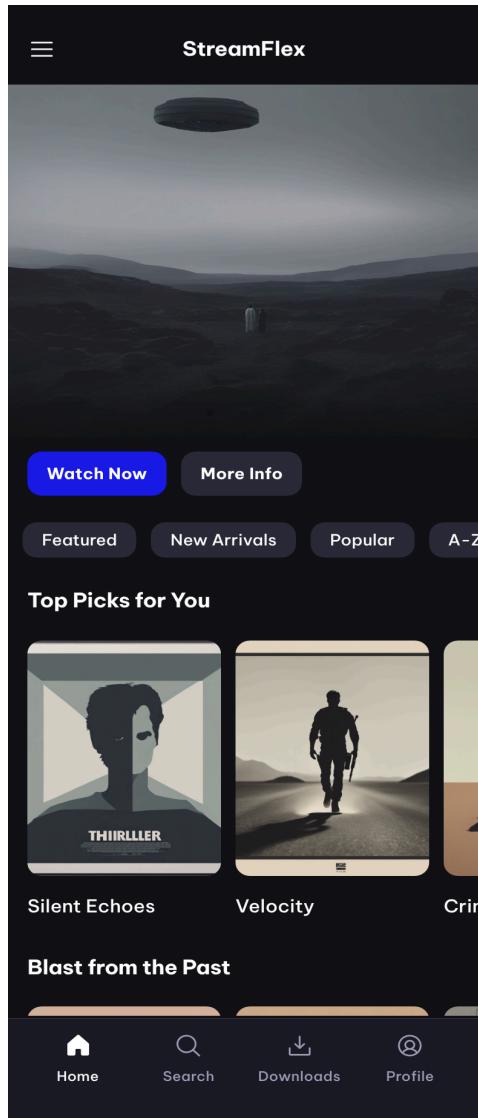


Figure: Galileo AI designed mobile app

This was one of the only designs that Galileo AI got a lot more accurately than the other ones. It has the relevant buttons, the navigation bar, the colors and the layout.

Lovable

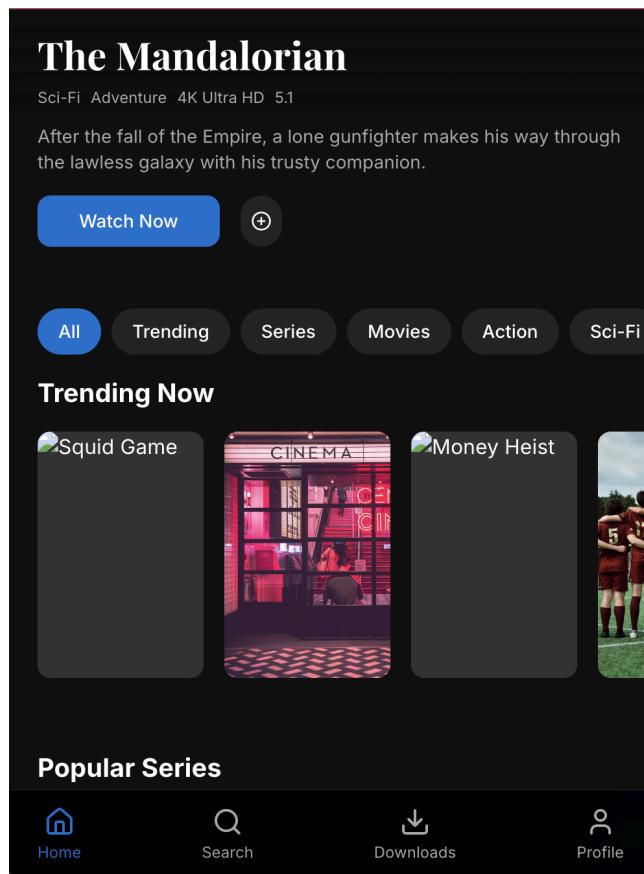


Figure: Galileo AI designed mobile app

Just by the screenshot above, you can probably tell that the sizing and layout looks a little off, that is because Lovable cannot create mobile app UI yet. However, it can create mobile browser responsive pages. It did create a navigation bar but no top bar, which was specified.

Analysis

After looking at all the designs made by a human and the designs generated with AI tools, I can determine that the AI UI designs are not as creative or original as the human designed UI. Galileo AI is focused on building a lot more technical looking landing pages and struggles with creative designs, whereas Lovable can design many different kinds of designs with a little creativity, but no originality. However, these AI tools are not supposed to be production quality and there are ways to export the designs, either as Figma files or React and TypeScript code to improve or iterate upon.

We can also look at how much time it took to create these designs. The human made UI designs would have taken weeks or even months to create, since designing UI and UX

research takes a lot of time, user feedback and testing to iterate upon. The AI tools generated these designs in seconds, with just a simple prompt.

Conclusion

It is obvious that as of now, AI is not capable of creating fully production designs and cannot be compared to the vast amounts of time and effort that human designers put into a UI design. However, AI can be used as a tool to speed up certain parts of the UI design process. Using AI in creative fields should not be viewed as a negative progression of design but instead be used to help us create a lot more creatively. The argument should not be about one tool over the other but how both AI and traditional design methods can be used hand in hand. UI design will always need humans for original designs, ethical and cultural inputs. The issue arises when designers or developers who do not have the resources to do UX research or design UI use AI to do this part of the job for them is when current UI design looks the same or there are overused components in these designs. The future of the role of AI in UI design and UX research depends on how people decide to use it for the design process.

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