

Exploration of Digital Interactive Advertising Creation Tools and Teaching Practices

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Abstract: With the acceleration of digital transformation, the advertising industry has entered a new stage of development, where digital interactive advertising has rapidly gained traction due to its interactivity and immersive experiences. This study systematically explores the core tools and applications of digital interactive advertising creation, focusing on how to effectively teach these innovative technologies in advertising design education. The paper provides a detailed analysis of commonly used design tools and their functionalities in advertising creation, covering user interface and prototype design tools, 3D and virtual/augmented reality tools, real-time interaction and visual effects tools, and hardware and physical interaction tools. Additionally, this study introduces the teaching practices of tools for interactive like TouchDesigner and Arduino into university advertising courses, aiming to enhance students' technical and creative abilities in digital interactive advertising creation. This research aspires to provide a pathway for integrating innovation and technology into advertising education to meet the challenges of rapid developments in the advertising industry and the new media environment.

Keywords: Digital interactive advertising; Digital interactive creation tools; Interactive advertising education

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1. Introduction

As the pace of digital transformation accelerates, the advertising industry has progressively transitioned into a new developmental stage. The adoption of innovative devices and techniques in digital advertising and marketing has provided more convenience, a wider reach, cost-effectiveness, and the ability to cross boundaries of distance and time.^[1] Contemporary consumers are increasingly unwilling to passively absorb advertising messages, favoring instead more interactive and personalized engagements. Within this context, digital interactive advertising has emerged, rapidly gaining traction in the market due to its interactive nature and immersive, multi-sensory experiences. By integrating advanced technologies such as Virtual Reality (VR), Augmented Reality (AR), and real-time interactivity, digital interactive advertising not only amplifies the communicative power of advertising content but also fosters deeper, more meaningful connections between brands and consumers. This paper aims to systematically explore the key tools and exemplary applications in digital interactive advertising creation, with a particular focus on methodologies for effectively teaching these innovative technologies within the context of advertising design education.

2. Tools for Digital Interactive Advertising Creation

In contemporary advertising design, interactivity and immersive experiences have become critical factors in capturing users' attention. An interactive ad encourages consumers to interact with the ad (and thus the brand),

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rather than just passively view the ad.^[2] To achieve these goals, designers rely on a diverse range of specialized tools to create advertising content that spans from user interface design to real-time interaction, etc. Different advertising projects demand distinct toolsets, making the selection of suitable design tools essential based on specific project requirements. This study introduces four categories of commonly used tools in advertising design: user interface and prototype design tools, 3D and virtual/augmented reality tools, real-time interaction and visual effects tools, and hardware interaction and physical interaction tools. Though this list does not include every possible tool, it does emphasize some of the most representative and commonly used tools in the daily work of advertising designers. Each of these tools has specific features and benefits that enable designers to realize a wide variety of creatively advertised projects.

(1) User interface and prototype design tools

User interface and prototyping tools are one of the fundamental elements of ad design and are used to design the look and feel of websites, mobile applications, and interactive advertisements and these tools enable the ad designers to come up with design mock-ups that simulate the user actions like clicking, swiping, and dragging to ensure that the user experience in an ad is smooth. Some of the common tools in this category include Figma, Adobe XD, and Sketch, which are very important in the design and development of digital advertisements.

Figma is a cloud-based UI/UX design tool that is used to design and build prototypes of websites, mobile applications, and interactive ads in real-time collaboration mode and it allows multiple users to work on the same project simultaneously and allows users to simulate actions like click, swipe, and hover through an interactive prototype. It is designed to support the reuse of parts of the design system and provides an extensive library of plug-ins to help ad designers quickly create and test interactive ads. Figma is especially well adapted to ad projects that demand intensive iteration and cross-team collaboration, particularly in quickly responding to the user experience needs in interactive ads.

PlanetPal is a sustainable product based platform run by an environmentally friendly retailer that focuses on offering eco-friendly products and inspiring users to participate in sustainable consumption via a loyalty plan. The plan promotes user loyalty and environmental awareness through a system of points and rewards. Designed by Regina G. for PlanetPal, the app aims to increase users' awareness of environmental protection and enhance brand loyalty. It does this through a points system, personalized recommendations and a clean interface design.

The main interface of the application displays popular discounts and product categories, such as food, clothing, and furniture, alongside the brand's vision to attract users. Users can complete tasks, promote the brand, or refer friends to earn points, which can be redeemed for rewards like eco-friendly products, discounts, or free events. The payment interface is simple and intuitive, maintaining a green visual theme to emphasize the eco-conscious message. Personalized elements within the application, such as usernames, current levels, and upgrade requirements, enhance user engagement and a sense of belonging. Each user's purchase history is reflected in the interface, providing personalized recommendations and exclusive reward choices, creating a community-focused experience around environmental sustainability and by these design choices, PlanetPal's application is not only a shopping tool but also a tool that fosters user engagement in sharing eco-friendly values and participating in sustainable actions, which is beneficial for both the brand and the users.

Pixso is an online UI/UX tool developed in China, which is mainly aimed at and adapted to the advertising and digital design industry and it integrates real-time collaboration, prototyping, and low-code development capabilities, which help designers and teams to work in real-time through a web browser and keep all the changes in sync and up-to-date, which significantly enhances the efficiency of the work process. Pixso's prototyping feature helps to create interactive ad prototypes and user experience tests to quickly check the effectiveness of ads and their performance by designers and its library of components and styles ensures that the look and feel is consistent across many platforms and projects, which is ideal for situations where ads need to be delivered in various formats.

Furthermore, Pixso provides low-code development assistance, which allows designers to export snippets of code directly, which is much faster than the design to deployment process. However, Pixso has a dependence on an on-line platform, with few plug-ins and limited extensibility, enabling designers to export snippets of code directly, thus accelerating the transition from design to implementation. These limitations may restrict cross-border team collaboration. Generally, Pixso is ideal for advertising projects that demand quick iteration and efficient collaboration, even though it is still potential for improvement in terms of international compatibility teams and more sophisticated project requirements.

Adobe XD is a professional UI/UX tool for designing interactive prototypes and dynamical user interfaces. It gives ad designers the ability to combine interactive behaviors such as clicks, swipes, and animated transitions to display user paths and dynamic visual effects in ads. Thanks to its auto-animation capabilities, transitions between ad elements becomes much more seamless, rendering it perfect for creating visually striking ad interfaces. XD's on-line communication features allow teams and clients to make advance previews and feedback in real time, making sure that quick adjustments and optimizations can be made to the ad project. For example, advertising agency McCann has adopted Adobe XD to design a web interface for a new model of a British car brand. By standardizing on XD, the McCann team enhanced workflow efficiency and the customer experience. XD integrates seamlessly with Creative Cloud and features an intuitive interface that enables designers to get started quickly, streamlines the design process, and eliminates problems associated with fragmented tools. Its interactive prototyping capabilities increase the liveliness and interactivity of demonstrations, speeding the visualization of ideas and enabling the team to create the iconic work on large-scale ad projects.

Sketch is a vector-based tool for design, used extensively for UI design and high-fidelity prototyping in web and mobile applications. It allows for the creation of reusable components and symbols to help to make sure that designs are consistent, and its extensive plug-in eco-system supports simple interactive effects and animations to empower the flexibility of ad design. The multi-panel functionality provides support for responsive design, enabling designers to resize ads for different devices in a single file. Sketch also integrates smoothly with development and collaboration tools such as Zeplin and InVision, enabling more efficient handoffs from design to development teams. In addition, Sketch provides a one-click export capability to rapidly generate ad assets in a wide range of formats.

However, Sketch is limited to macOS, making it inaccessible to Windows users, and its interactive capabilities are relatively limited, with less real-time collaboration functionality compared to cloud-based tools. Large advertising projects often require manual management, and the tool's strong reliance on plugins can lead to compatibility issues after software updates. Overall, Sketch is suitable for static and responsive ad designs requiring quick creative validation and production, though it has certain limitations in system compatibility, cross-platform collaboration, and advanced interactivity.

Aeon Studio, a Croatian design firm, specializes in delivering high-quality designs using Sketch, from brand concepts to application interfaces. The team maintains a lean structure for flexible collaboration, utilizing Sketch to provide end-to-end support from ideation to final product. They particularly appreciate Sketch's component and style features, which help them maintain organization and consistency in complex projects. Aeon Studio emphasizes that Sketch is a core tool and partner in their creative workflow.

(2) 3D and virtual reality/augmented reality tools

3D and virtual reality/augmented reality (VR/AR) tools are indispensable in advertising design, especially as immersive experiences and interactive scenarios become more prevalent in modern advertising. These tools enable advertisers to offer users highly realistic 3D models, animations, and VR/AR experiences, enhancing the visual impact and interactivity of advertisements. Commonly used tools in this category include Unity and Blender, which provide robust technological support for 3D and VR advertisements.

Unity is a powerful real-time 3D engine widely used in the development of virtual reality (VR), augmented reality (AR), and gamified advertising experiences. It supports the publishing of ad content across multiple platforms, allowing advertisers to provide immersive, interactive experiences to users. Typical applications of Unity in advertising include showcasing product models using VR/AR technology or enabling users to interact with brands in gamified advertisements. Its gamification capabilities are particularly effective in engaging users, enhancing brand awareness and loyalty through interactive games or tasks. AR establishes a closer relationship between users' physical space and virtual objects. Therefore, the user experience with AR is more immersive, more vivid, more interactive, and more realistic.^[3] VR provides advertisers a further ability to arouse the player's desire towards increasing their conviction about purchasing the advertised product. One way to do this would be to allow the consumer to "test" or "feel" the product, both of which can be simulated in virtual reality, thus improving their confidence in their purchase decision-making.^[4]

IKEA's "IKEA Place" application was developed using Unity and Apple's ARKit, while the American company Parametric Technology Corporation (PTC) incorporated Unity's AR functionalities into iOS applications through "Unity as a Library"^①. This approach allows IKEA to enable virtual furniture placement within its app, where users can place 3D models in their real space via their phone's camera, thereby enhancing the shopping experience (Fig. 1).

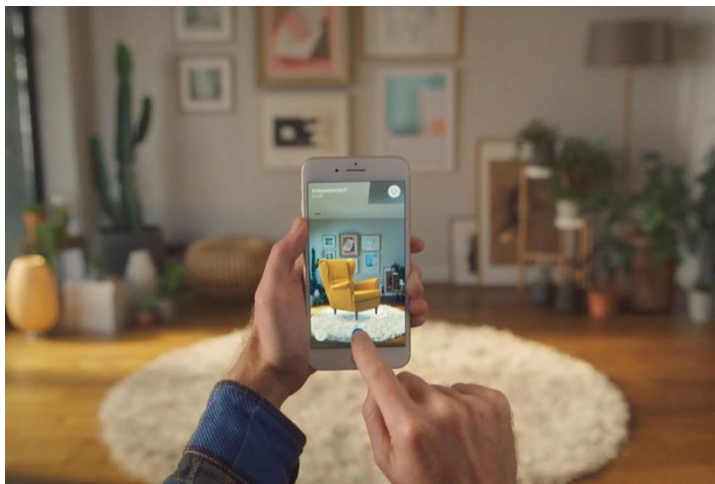


Fig. 1 IKEA Place Application by IKEA (Image credit: <https://space10.com/projects/ikea-place>)



Fig. 2 Commercial Advertisement for the BMW X5 Series (Image credit: <https://www.youtube.com/watch?v=FTnXhKLInkY>)

Blender is an open-source 3D modeling and animation tool widely used for creating 3D static content and animations in advertising. Its powerful modeling, animation, and rendering capabilities enable advertising

designers to produce complex 3D product displays, character animations, or scenes. Although Blender itself does not support interactive functions, designers can import the generated 3D content into interactive engines (such as Unity) to develop interactive advertisements. Blender is frequently used to create high-quality 3D visual effects in advertisements, such as brand showcase videos or product animation ads. Switzerland-based "L'Avenue Digital Media", a digital media company specializing in advertising, 3D rendering, animation design, and media planning, used Blender to produce a commercial for the BMW X5 series. This project combined realistic and artistic rendering techniques to showcase the detailed features and lifelike animations of the BMW X5 (Fig. 2).

(3) Real-time interaction and visual effects tools

Although not as widely adopted in the advertising industry as traditional design tools, real-time interaction and visual effects tools are becoming essential in innovative advertising, especially for large-scale installations, stage visuals, and interactive advertising scenarios requiring real-time responsiveness. These tools generate dynamic content using real-time data, significantly enhancing audience engagement. They are frequently used in public events, exhibitions, and brand activities to create immersive interactive experiences. Tools like TouchDesigner, Processing, and Notch enable designers and creative teams to produce complex real-time visual effects that integrate music, video, and animation, responding instantly to audience behaviors or environmental changes. Consequently, while the application range of these tools in the advertising sector may be specialized, they provide valuable solutions for projects requiring innovative, interactive features, particularly in contexts where attracting audience attention and increasing brand engagement are paramount.

TouchDesigner is a visual programming tool from which real time visual effects can be generated, especially suited for generating interactive content in advertising installations and large-scale campaigns. It enables interactive visualizations triggered by sensor inputs, audio feedback and 3D graphics, with the possibility for the user to interact with the advertising content through sound, touch or motion. The tool is widely used in exhibitions, events and public advertising installations, dynamically adapting visuals based on user behavior to increase engagement. TouchDesigner's real-time processing ability enables it to be the tool of choice for creating complex interactive advertisements, especially in environments that require dynamic responses.

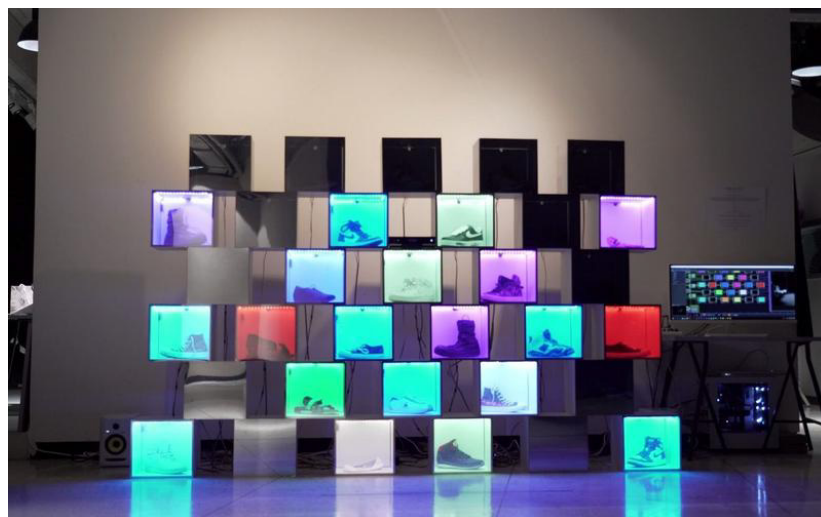


Fig. 3 Shoe Interaction Installation (Image ccredit: https://www.bilibili.com/video/BV1r5411M7j9/?vd_source=84d4b41337e7fad053c1bb4a564344b8)

For example, a footwear brand used TouchDesigner to develop an interactive installation (Fig. 3) that showcases shoes in a lighted box in response to nearby motion. As individuals pass by, the corresponding boxes light up, and the illuminated boxes further interact with background music, synchronizing with the rhythm. This type of experience can significantly strengthen the connection between brands and consumers, enhancing brand recall and

engagement by encouraging users to actively participate in the brand narrative.

Notch is a tool focused on real-time 3D content generation, has been applied in large advertising events, stage visual design, and advertising installations. Notch provides robust real-time 3D rendering capabilities, able to process real-time data from user behaviors or environmental factors to create highly interactive advertising experiences. Its projection mapping feature makes it especially effective for large outdoor or building advertisements, allowing ad content to dynamically map onto physical surfaces, updating in real-time based on environmental or user behavior changes. Notch is particularly suited for large-scale brand events and exhibition ads requiring real-time visual generation and user interaction.

"Guinness", a globally renowned Irish beer brand known for its rich stout and iconic creamy foam, collaborated with the Dublin-based companies "Archetype" and "Algorithm" to create an interactive experience centered around the image of "St. James's Gate"^②. This event, titled "After Dark," employed the Notch system, which used scene fields and particle emitters to develop a spray brush simulator that allowed for quick testing and adjustment of variables like size, color, and speed (Fig. 4). Notch's fast rendering and scene field functionalities ensured the project could proceed smoothly within a limited time frame, allowing brand elements to be easily added later without disrupting the original design. This ensured both the efficiency and flexibility of the interactive experience.



Fig. 4 Photo from the Guinness "After Dark" Event (Image credit: <https://www.algorithm.ie/guinness-after-dark>)



Fig. 5 Perception of the Flowing Time: Montblanc's Data-Driven Generative Artwork (Image credit: <https://onformative.com/work/montblanc-generative-artpiece>)

Processing is an open-source programming language and development environment focused on graphic design, interactive art, and data visualization, making it particularly suitable for artists and designers. In advertising and brand events, Processing can be used for interactive ads, data visualization, and creative live-generated art. Brands can leverage Processing to enable real-time interaction between the audience and ad content, display dynamic data, or even create visual effects based on audience movements during events. Combined with projection technology, Processing also provides immersive experiences for brand events, enhancing brand appeal and user engagement. As a flexible tool, Processing helps brands stand out in a competitive landscape, delivering more creative and interactive advertising content.

The above image is a generative artwork (Fig. 5) created by the digital art and design studio "Onformative"[®]] based in Berlin, Germany, for the German luxury brand Montblanc. This project utilized the Processing programming language to create a unique digital art experience for the launch of Montblanc's new chronograph. The artwork is composed of two core elements: intricate linear structures and amorphous forms, which together visualize the characteristics of Montblanc's watch, showcasing the utmost precision of the watch movement and the high-quality materials. The "Onformative" team skillfully employed Processing and its extensive libraries to achieve a high level of generative artistry. To realize complex visual effects, they used several Processing libraries, including *toxiclibs* for fluid simulations, *GLGraphics* for shadow rendering, *meshLib* and *Ani Tweening Library* for controlling mesh animations, and *ControlP5* and *ProScene* for camera angles and controls. This case shows how Processing is used in practice in the commercial field, and it has a strong advantage in generative art and interactive design, and enhances Montblanc's brand image and fashion sense.

Arduino is open-source electronics prototyping platform that consists of hardware and software tools, including microcontroller boards and IDE and it is designed to be a basic, versatile, and easy-to-use tool for artists, designers, engineers, and creators to create interactive projects. Arduino uses a C/C++ like language and has support for a variety of sensors and actuators that can interface with a plethora of electronics. Due to its low cost, ease of programming and high flexibility, Arduino has a great potential for application in the advertising field to create interactive advertising structures and unique advertising objects. By connecting to different sensors and actuators, Arduino allows the development of interactive advertising tools that adapt to changes in user behavior and the environment, enhancing advertising appeal and user engagement. Although the use of Arduino in the advertising industry is not yet widespread, the growing demand for innovation and personalized experiences suggests that Arduino could play a more prominent role in the future, facilitating the fusion of technology and creativity and opening new possibilities for advertising innovation.



Fig. 6 Burger Shooting Process (Image credit: <https://newstv.fr/2016/08/26/coulisses-pub-parfait-hamburger/>)

Steve Giralt is a renowned advertising photographer who has created campaigns for multiple well-known brands. During a burger advertisement shoot, he employed mechanical devices to precisely control the movement of ingredients, capturing slow-motion visuals of ketchup and mustard colliding, as well as the patty and vegetables falling from above (Fig. 6). The team used seven robotic arms and five high-speed cameras, achieving millisecond synchronization through the "Precision Arduino Timing Relay Imaging Controller" (P.A.T.R.I.C.). In this process, Arduino-controlled dual launchers and other systems triggered ingredient movements at precise moments, achieving complex visual effects.

In conclusion, as advertising creativity continues to evolve, digital interactive advertising, supported by advanced technology and a variety of creative tools, is providing brands with unprecedented levels of user engagement. From UI prototyping to the integration of 3D and VR/AR visual effects, and further to real-time interaction and the innovative use of physical hardware, these tools not only enable advertising designers to create more vivid and tangible brand representations but also bring new vitality to the personalization and diversity of ad content. In the future, as technology advances further, digital interactive advertising will increasingly focus on enhancing user experience, even achieving deeper levels of immersive interaction, ultimately serving as a vital bridge between brands and consumers.

3. Digital Interactive Advertising Teaching Practice

As digital interactive technology and production tools mature, advertising companies are increasingly incorporating digital technology into ad production. Meanwhile, in higher education, the teaching of digital media technology and art is no longer confined to digital media art majors; advertising programs should also include such courses to help students understand innovative applications in current advertising practices, stimulate their creativity, and keep pace with industry advancements. Especially in the context of rapid developments in new media, society has entered a digitally connected era, profoundly impacting how advertising creativity is presented. Technological advancements in the digital media age—such as mobile internet, the Internet of Things, cloud computing, virtual technology, and artificial intelligence—have provided more convenient tools for digital advertising and opened new perspectives for ad creativity. The multimedia era's modes of communication require advertising creators to deeply engage in the creative process, collaborating with audiences in creative storytelling.

The author of this paper has introduced a course titled "Digital Interactive Advertising" within an advertising program at a university. This course guides students in understanding the latest forms and techniques in digital interactive advertising creation through three main areas: (1) understanding the new technologies, applications, materials, and contexts that support advertising communication; (2) recognizing innovative advertising case studies in brand display, digital presentation, virtual reality display, and interaction design within the new media environment; and (3) learning the technologies, application scenarios, and classic examples of digital interactive advertising creation in the context of new media.

(1) Case studies

Firstly, the teaching cases are primarily focused on two aspects: digital interactive technology and art. The development of digital interactive techniques has significantly enhanced the creativity of advertisements, allowing advertisements to go beyond the static display and reach the level of real-time interaction, individualized experience, and integration of multiple senses. This has greatly enhanced the appeal and effectiveness of advertising. The introduction of case studies in this field allows students to understand how these techniques can be used to transcend the conventional advertising approach and create a more engaging and realistic brand experience that meets the expectations of modern users for interactivity and immersion. Besides, art adds an emotional and aesthetic perspective to advertising ideas, which makes them more effective. Digital interactive art is

a combination of technology and art, which makes advertising creations more valuable and visually appealing due to the higher expressiveness.

Table 1. Teaching Cases of "Digital Interactive Technology"

Technology Category	Specific Cases
Immersive Projection	Digital Flavors, etc.
3D Mapping	3D Mapping
Holographic Projection	360-Degree Holographic Projection
Multimedia Interactive Wall	Magic Wall, Radar Touch Wall, Graphite Touch Wall
Non-Standard Screen Display	Dual-Sided Display, Curved Surface Display, Spherical Display, Moving Screen, Water Drop Screen
Immersive Theater	Dome Theater, Scent Cinema, 7D Cinema
Virtual/Augmented/Mixed/Extended Reality	VR, AR, MR, XR
Digital Twin	Digital Twin Model
Digital Guided Tours	VR Tour, AR Tour
Digital Exhibition Hall	Digital Exhibition Hall Design
Virtual Scene Tours	Virtual Tours (integrating mechanical interactive devices and 3D navigation technology)
Interactive Display Devices	Digital Sand Table, Digital Flipbook, Digital Waterfall
Gesture Recognition Technology	Gesture Recognition
Glasses-Free 3D Display	Glasses-Free 3D Display
Special Projection Displays	Fabric Screen Projection, Water Screen Projection, Disc Projection, Transparent Display, Mist Screen
Drone and Mechanical Devices	Drone Formation, Particle Display, Robotic Arm
Object/Facial/Body Recognition and Tracking	Color Recognition, Human Sensing, Facial Tracking, Body Tracking, Object Tracking
Shadow Interaction	Shadow Following (integrating Kinect, screen, and spliced screen technology)
Virtual Try-On	Virtual Try-On Application
LED Interactive Installations	LED Fireworks, LED Columns, Spherical LED Installation, Stage LED, Floor LED, Linear LED Strips
Light Arrays	Infinite Abyss (Programmable Light Matrix)
AI and Robotics Applications	Smart Robots, AI-Driven Interactive Installations

Table 2. Teaching Cases of "Digital Interactive Art"

Art Type	Representative Artists
Audio-Visual Interactive Art	Alva Noto, Ryoji Ikeda, Team Lab, D'strict, Moment Factory
Computer-Generated Art	Harold Cohen, Frieder Nake, Vera Molnar, Manfred Mohr
Spatial and Installation Art	Wang Yuyang, Peter Kogler, Leo Villareal, John Gerrard
Dynamic Data Visualization	Charles Sandison, Casey Reas
Digital Generative and Virtual Art	Michel Bret, Edmond Couchot, Miguel Chevalier
Nature and Ecological Interactive Art	Laurent Mignonneau, Christa Sommerer
Human Body and Kinetic Installations	Celyn Bricker, Daniel Rozin, Elias Crespín
Interactive Light and Shadow Installations	Alan Rath, Michel Paysant
Virtual Immersive Experience	Liu Wa, Quayola, Memo Akten, Leonel Moura

Through the demonstration of "Digital Interactive Technology" and "Digital Interactive Art", students can systematically learn the technical application and artistic expression techniques in the creation of advertisements. This understanding will enable them to enhance the interactivity of the future interactive advertisements and also to provide them with aesthetic value and cultural value.

(2) Technology learning and creation

As the primary instructional software and hardware, this course was chosen for its interactivity, real-time functionality, and creative flexibility with TouchDesigner and Arduino. Arduino is an open-source electronic prototyping tool that allows students to incorporate TouchDesigner to enhance physical interaction that fosters participation and learning through practical experiences.

The use of these tools fosters not only interdisciplinary cooperation, allowing students to use programming, audio processing, and interaction with hardware at the same time, but also opens up a wide range of opportunities for creativity in various projects. Furthermore, the use of TouchDesigner and Arduino in advertising, art installations, and stage design promotes design thinking and problem-solving skills since it is crucial to encourage students to experiment and learn in a risk-free environment that will prepare them for their future professions. Below are a few examples of student-created projects:

Project 1: Bimber Whisky – The Four Elements^④ (Fig. 7)

Background:

Ancient Greek philosophy posited that the universe is composed of four elements: water, fire, air, and earth. Aristotle expanded on this theory, proposing that the elements forming celestial bodies differ from those on Earth, as they are composed of pure "aether." He theorized the order of the universe: "earth," the heaviest, forms the Earth's core; "water," being lighter, covers the Earth's surface; "air" and "fire," lighter still, hover around the Earth or ascend; and "aether," the lightest, is found in the heavens, orbiting around the Earth. Though this theory has faced debate, its influence is profound.

In August 2023, the British spirits brand "Bimber" launched *The Four Elements* series of whiskies, featuring four expressions inspired by water, fire, air, and earth, created specifically for the whisky retailer *Master of Malt*. This series reflects Bimber Distillery's unique production process, from sourcing single-farm barley and utilizing floor malting to drawing mineral-rich water from London, carefully selecting peat, and using handcrafted toasted casks. These elements—fire, earth, water, and air—infuse each step, embodying the artisanal craftsmanship of Bimber whisky and the distillery's meticulous attention to detail.

This interactive installation, inspired by *The Four Elements* whisky packaging, uses motion-tracking technology. Drawing on the admiration for whisky expressed by renowned authors and figures, the installation features four interactive devices representing water, fire, air, and earth. When viewers stand in front of these installations, they can experience the profound flavors. Interacting with the installation allows them to immerse themselves in the rich heritage of whisky culture.



Fig. 7 Bimber Whisky – The Four Elements

Technical Analysis:

This project combines a computer camera with motion-tracking technology in TouchDesigner software.

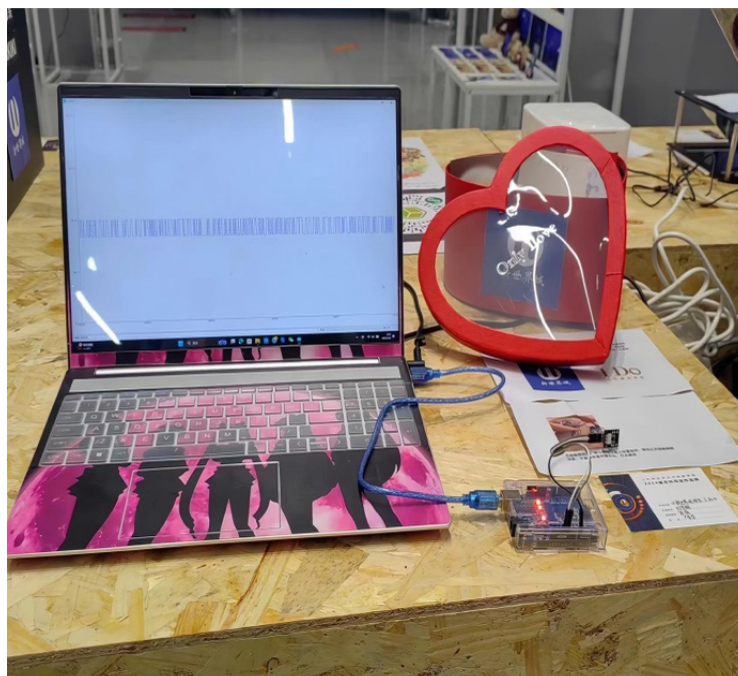


Fig. 8 I Do Installation

Project 2: I Do Installation[®] (Fig. 8)

Fig. 8 I Do Installation

Background:

"I Do" is a well-known Chinese jewelry brand specializing in wedding rings. Its diamond ring series centers on the themes of romance, commitment, and eternal love. The brand's designs typically emphasize a blend of classic and modern styles, aiming to meet the high-quality standards of modern young consumers seeking symbols of love. The brand slogan, "I Do," conveys an unspoken declaration of commitment and emotion, making "I Do" rings particularly popular among couples who value personalization and emotional expression in their choice of wedding rings. Inspired by these values, the *I Do Installation* was created. This installation measures the heartbeat index between couples, visually presenting their feelings for one another and creating a romantic atmosphere. It invites couples to experience this unique emotional interaction before purchasing an "I Do" diamond ring.

Technical Analysis:

In the *I Do Installation*, Arduino is connected to a heart rate sensor. When viewers touch the device, it collects their heartbeat signals in real time and transmits the data to a computer (Figure. 9), which dynamically displays their heartbeat rhythm as an electrocardiogram (ECG). Arduino manages the collection, transmission, and processing of the heart rate signals, ensuring the ECG's accuracy and real-time responsiveness (Figure. 10). This technology not only enhances the installation's interactivity and sense of technological sophistication but also effectively combines interactivity and sense of technological sophistication but also effectively combines emotional experience with brand marketing, offering users a personalized and romantic experience.

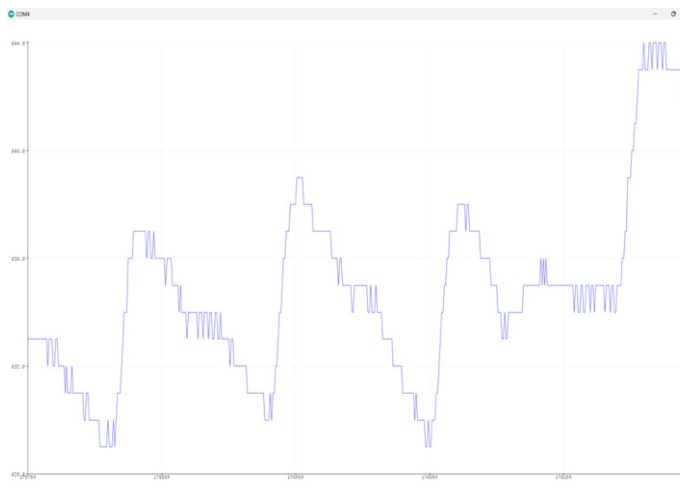


Figure. 9 Viewer's ECG



Figure. 10 Code Input in Arduino Software

(3) Challenges

Several challenges accompany the adoption of these tools in teaching practice:

High entry threshold: Both TouchDesigner and Arduino can be challenging for beginners, requiring strong logic and hands-on skills, which may result in initial frustration among some students.

High computer configuration requirements: TouchDesigner demands substantial computing resources to process complex visual effects. Students without adequate hardware may be unable to fully experience the software's capabilities.

High Cost: The course's requirements for specific hardware (Arduino boards, sensors, computers, etc.) and software can impose financial burdens on educational institutions with limited budgets or on students who lack access to necessary equipment. Additionally, displaying projects may require specialized hardware or large screens, which could hinder students' ability to showcase the full interactivity and visual impact of their work if resources are insufficient.

Cross-Platform Compatibility: TouchDesigner's support for macOS is limited, and its performance on macOS may lag compared to Windows. This may affect students using macOS systems, impacting their learning experience.

4. Conclusion

In conclusion, the tools for creating digital interactive advertising not only invigorate advertising creativity but also bring brand imagery to life through their powerful interactivity and immersive experiences. Introducing tools such as TouchDesigner and Arduino into the curriculum effectively enhances students' creative abilities and helps them understand the technical and artistic aspects of digital interactive advertising from multiple dimensions. The future development of digital interactive advertising will likely emphasize the integration of advanced technologies such as artificial intelligence and machine learning, driving the advertising industry toward greater intelligence, personalization, and real-time responsiveness. With the rise of metaverse, leading brands have started to actively experiment with metaverse advertising.^[5] As technology advances, digital interactive advertising is expected to meet

branding needs while providing users with rich, memorable experiences. Advertising professionals and educators must keep pace with these changes, continually exploring innovation to develop impactful brand communication strategies through digital interactive advertising.

Notes

- ① This term refers to Unity's capability to be built as an embeddable library that can be integrated into existing native applications (such as iOS and Android apps). This allows these applications to leverage Unity's 3D rendering and augmented reality (AR) functionalities.
- ② St. James's Gate is an iconic landmark in Dublin, Ireland. Once the western entrance to the city, it is now the site of the Guinness Brewery. In this project, it served as a canvas for interactive art, utilizing projection technology and motion tracking, allowing participants to leave their personal creative marks on this historic landmark. This symbolizes the brand's commitment to both innovation and tradition.
- ③ Onformative Studio Website: <https://onformative.com>
- ④ Creators of this work are Zhang Han, Lin Tingting, Yin Ruiqing, Shi Jiongyuan, Weiyl.
- ⑤ Creator of this work is Liu Yutong.

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