Florist: (AR system)

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Florist
(AR system)

By

Yanran Ding

Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of fine Art in Visual Communication Design

Department of Visual Communication Design
College of Art and Design

Rochester Institute of Technology
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The School of Visual Communication
Rochester Institute of Technology | Rochester, New York

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Adam Smith
Associate Thesis Advisor

Abstract and Keywords
1. **Abstract**

The "Florist (AR system)" envisions a novel application of Augmented Reality (AR) in floral design, aimed at harmonizing traditional floristry with the digital age. While the full system is not yet realized, the conceptual design presents a compelling visual and interactive blueprint. It anticipates a platform that educates and assists users in crafting personalized floral arrangements through a rich database, AR tutorials, and customization features. This conceptual framework promises to address common barriers in flower arrangement by fostering an accessible, user-centered experience that could transform the floristry landscape.

2. **Keywords**

Florist (AR system)

Petal Power Meets Pixel Perfection

Introduction:

The "Florist (AR system)" is an innovative project designed to revolutionize the art of floral arrangement by integrating the cutting-edge technology of Augmented Reality (AR). This system aims to bridge the gap between traditional floristry and the digital era, offering an immersive and interactive experience that enhances the creativity and skills of users in selecting and arranging flowers.

Background:

My project originates from the fusion of technology and the elegance of flowers.

In today's world, the increasing integration of technology into our lives has inspired me to explore its potential within the realm of floral artistry. AR has been around for a while, but recent advancements in technology have made it more accessible and affordable, and it's being used in a wide range of applications. (Clara, 2023)

Besides that, flowers are also big business: Worldwide, about 15 billion stems make their way to buyers each year. (Stephen, 2015). The United States Floriculture Market size is expected to grow from USD 49.02 billion in 2023 to USD 66.66 billion by 2028, at a CAGR of 6.34% during the forecast period (2023-2028). Flowers have the remarkable ability to evoke emotions, brighten up spaces, and bring a touch of nature into our lives. (SCHOOL DEKHO, 2023) Throughout history, flowers have consistently been integrated into our landscapes, adorned our living spaces, and been a staple of decorative arrangements. The art of flower arranging is highly regarded as a form of creative expression and is highly esteemed (MAISONMAI, 2022).

I am driven by the idea of enhancing the art of flower arrangement through the utilization of augmented reality (AR) technology. AR has the capability to blend the virtual and real worlds, opening up new possibilities for creativity. With this in mind, I am developing a solution that leverages AR to provide a fresh approach for individuals seeking to adorn their living spaces with captivating floral displays.

Understanding that many individuals encounter challenges when it comes to selecting and arranging flowers, I am working to design an AR flower arrangement system that streamlines these processes. Through environment scanning, comprehensive flower knowledge, interactive tutorials, and placement guidance, I aim to empower users like me to effortlessly design exquisite floral compositions that harmonize perfectly with their surroundings.
Goal:

My aspiration is to create a user-friendly and immersive experience that marries the appeal of technology with the timeless beauty of flowers. By merging innovation with aesthetics, my project endeavors to redefine traditional approaches to flower shopping and arrangement, offering a modern, creative, and accessible way to integrate the charm of nature into our daily lives.

Problem Statement:

In a recent study within the floral industry, critical challenges were uncovered that customers face at traditional flower shops. A notable knowledge gap in floral arrangement exists, leading to a heavy reliance on commercially prepared bouquets. Consumers often refrain from arranging flowers at home due to a lack of expertise in this craft. Concurrently, there is a discrepancy between the appreciation of flowers and the frequency of purchase, largely attributed to the high cost of professionally curated arrangements. For instance, a standard bouquet is priced at approximately $100, as indicated by Stacy K Floral as of December 2023, which deters regular purchases.

Moreover, while more affordable options such as loose flowers are available at supermarkets like Wagen’s—with prices starting at $5.00—the lack of arranging skills among consumers often renders this alternative less appealing. Additionally, the decision-making process regarding the appropriateness of flower types for various occasions is fraught with uncertainty. This often leads to a mismatch between the purchased arrangements and the desired sentiment or event ambiance, a concern outlined by MAISONMAI in 2022.

Proposed Solution:

Addressing these identified issues, the Florist system is introduced as a potential remedy. This innovative platform is tailored to enhance the consumer experience by providing an accessible interface that assists in the selection and arrangement of flowers. It aims to empower users to construct personalized, cost-effective floral designs that are suitable for a range of occasions. By equipping consumers with the tools to overcome the barriers of arrangement knowledge and cost, the Florist system seeks to instill a sense of confidence and proficiency in floral arrangement, fostering a deeper engagement with the beauty and artistry of flowers.

My Design solution:

The Florist AR system is a cutting-edge AR application designed for wearable glasses, which serves as an interactive tool for enhancing the flower selection and arrangement process. It intelligently assesses the user's environment and context to provide customized floral arrangement recommendations, making it easier for users to create aesthetically pleasing and situation-appropriate floral displays. This solution situates the user in an immersive, augmented reality where the art of floristry becomes an accessible and enriching experience.
Enhanced User Interaction with Gesture Instructions: The system is initiated by the user donning AR glasses, transitioning them into an augmented space where interaction with the system is governed by intuitive gesture commands. These gestures include simple motions such as clenching a fist to ‘grab’ an object or opening the hand to ‘lay down’ an item, with additional gestures like ‘click’ and ‘double-click’ to navigate the interface. This hands-free operation is crucial for users to interact with the system while engaging in the intricate work of floral arrangement.

Environment Analysis for Personalized Recommendations: Upon activation, the Florist system conducts an environmental analysis through the user’s line of sight. It assesses aspects such as color schemes, decor elements, and the overall ambiance to suggest floral arrangements that complement the user’s surroundings. This intelligent feature tailors recommendations to ensure that the chosen arrangements harmonize with the existing environment.

Accessible Flower Information at a Glance: The system presents an interactive 'Flower Information Card' for each potential arrangement option. These digital cards provide essential details such as the difficulty level of the arrangement, types of flowers used, their meanings, and recommended usage scenarios. This empowers users with comprehensive information to make an
informed selection that aligns with their preferences and the intended occasion.

Simulated Placement for Optimal Arrangement: Once the user selects a preferred bouquet, they can utilize the 'Simulated Placement' feature to virtually position the arrangement within their space. This simulation aids in determining the most suitable location for the bouquet, ensuring the arrangement enhances the spatial aesthetics.

Intelligent AR Arrangement Tutorials for Hands-On Learning: The system’s AR tutorial mode provides an interactive learning experience, leveraging AR scanning and analysis to interpret the user’s actions and provide automated, step-by-step guidance. This intelligent assistance makes the tutorial
easy to follow and interact with, removing the need for manual controls such as fast-forwarding or rewinding, thus allowing for a seamless and hands-free tutorial experience.

Incorporating these operational steps, the Florist AR system is meticulously crafted to provide a seamless, interactive, and educational journey in floral art. It enables users to not only learn and create beautiful arrangements but also to do so in a way that is tailored to their environment and personal preferences, all while being guided by an intuitive and responsive AR interface.

**Conclusion:**

In conclusion, this project is a realization of what has been identified as "a synergy of technology and traditional craft made possible," highlighting the potential for innovation within the realm of artistic expression (AmbiKraf, 2013). By harnessing the power of Augmented Reality, the project not only confronts the prevalent barriers in floral artistry but also reimagines the entire process of flower selection and arrangement. It addresses the challenges of skill gaps, financial constraints, spatial visualization difficulties, and time limitations with an innovative, user-centered design. The AR system transcends mere novelty; it offers a practical, educational, and enriching platform that can elevate the aesthetic experience of floral enthusiasts and novices alike. As the project culminates, it is poised to democratize the beauty of floristry, making it an accessible and integral part of modern home decor. In doing so, it promises to infuse our lives with the effortless charm of nature, tailored to our individual spaces and styles, and to do this with the simplicity and grace that only a seamless blend of nature and technology can achieve.

**Reference**


INTRO

The "Florist (AR system)" project is an innovative venture that merges augmented reality (AR) technology with the art of floral arrangement. This project aims to enhance the experience of selecting and arranging flowers, making it more accessible, intuitive, and enjoyable for a wide range of users.
INSPIRATION

I am driven by the idea of enhancing the art of flower arrangement through the utilization of augmented reality (AR) technology. AR has the capability to blend the virtual and real worlds, opening up new possibilities for creativity. With this in mind, I am developing a solution that leverages AR to provide a fresh approach for individuals seeking to adorn their living spaces with captivating floral displays.
Emergence and Evolution of Augmented Reality (AR): AR technology has been developing over the years, but recent advancements have significantly increased its accessibility and affordability. These technological strides have allowed AR to be applied in various fields, ranging from entertainment to education, and now to more specialized sectors like floral design and home decor.
OFFLINE FLORIST RESEARCH

To gain a better understanding of understanding Market Needs and Trends, analyzing Customer Behavior, and assessing Technological Application in Reality, I visited several offline flower shops and conducted a survey.
Do you like flowers in your area?
- Yes (85.7%)
- Other Answer (14.3%)

Are you interested in or experienced in real-life flower arranging or floral art activities?
- Yes (57.1%)
- Other Answer (42.9%)

How do you get your flowers?
- In supermarket or other grocery store (85.7%)
- Other Answer (14.3%)

What kind of flowers you like to buy
- Designed bouquet (57.1%)
- Other Answer (42.9%)

Would you like to make your bouquet?
- Yes (85.7%)
- Other Answer (14.3%)

Have you ever heard of or tried using AR (Augmented Reality) technology?
- Yes (57.1%)
- Other Answer (42.9%)

What are the important parts you think when you trying to use an AR tutorial?
- Visibility: 71.4%
- Easy to use: 85.7%
- Comprehensive function: 42.9%
- Interesting user experience: 42.9%

What practical benefits or enjoyment do you expect from using an AR flower arranging system?
- Arranging skills: 85.7%
- Virtual experimentation: 71.4%
- Virtually trying: 71.4%
- Gaining inspiration: 42.9%
### COMPETITIVE ANALYSIS

<table>
<thead>
<tr>
<th>APP/Web Name</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 flower</td>
<td>Picture gallery of over 1000 flower arrangements,</td>
<td>• Overall layout looks out of style;</td>
</tr>
<tr>
<td>arrangements</td>
<td>- scroll through hundreds of flower images;</td>
<td>• Theme color not looks good;</td>
</tr>
<tr>
<td></td>
<td>- create a collection of your favorite images;</td>
<td>• Single function;</td>
</tr>
<tr>
<td></td>
<td>- share images.</td>
<td>• Navigation not works well.</td>
</tr>
<tr>
<td>Bridal Bouquet</td>
<td>A fully 3D website that teaches flower arrangement, where users can</td>
<td>• Function limited;</td>
</tr>
<tr>
<td>Builder</td>
<td>select their preferred bouquet colors or varieties to complete their</td>
<td>• Style not unify.</td>
</tr>
<tr>
<td></td>
<td>creations.</td>
<td>• Operating a computer is not very convenient when arranging flowers.</td>
</tr>
<tr>
<td></td>
<td>- Elegant style;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Clear steps.</td>
<td></td>
</tr>
<tr>
<td>Bloody Pro</td>
<td>• Easily create bouquets online, 24/7</td>
<td>• Overall layout doesn’t look good;</td>
</tr>
<tr>
<td></td>
<td>• Easily share your bouquets with everyone</td>
<td>• Not convenient when using.</td>
</tr>
</tbody>
</table>
1. Limited Knowledge and Skills:

Many individuals lack expertise in flower selection and arrangement, leading to difficulties in making choices and achieving desired bouquet outcomes.

2. Cost of the Pre-Packaged Bouquets

Some may find the prices of pre-packaged bouquets from flower shops to be high, seeking more cost-effective ways to decorate their homes.
3. Uncertainty in Placement

People might struggle with determining the best placement for floral arrangements within their homes, potentially requiring trial and error.
4. Time Constraints

Busy work schedules and lifestyles can result in users having insufficient time to research flower choices and arrangements.
TARGET USER

1. Individuals who want to enhance their living environment but have limited flower knowledge;
2. People who want to express emotions with flowers but lack sufficient flower arrangement knowledge;
3. Those interested in flowers but find pre-packaged flowers in flower shops expensive;
The "Florist (AR system)" project is an innovative venture that merges augmented reality (AR) technology with the art of floral arrangement. This project aims to enhance the experience of selecting and arranging flowers, making it more accessible, intuitive, and enjoyable for a wide range of users.
Emily Johnson
Office Manager

ABOUT
Emily is a young professional who recently moved into a new apartment. She has a strong desire to create a warm and inviting living environment with fresh flowers. However, she has limited knowledge about floriculture and flower arrangements. She wants to buy flowers that will complement her home decor but is unsure which flowers to choose and how to arrange them effectively.

MOTIVATION
1. Home Decoration: Emily's motivation is to enhance her living environment with beautiful and fresh flowers, creating a pleasant and comforting atmosphere.
2. Visual Appeal: She wants to add a touch of beauty and elegance to her home, making it a welcoming space for herself and her guests.
3. Learning Opportunity: Emily is motivated to learn more about flowers and flower arrangements to develop her skills in home decor.

CORE NEEDS
1. Guidance and Education: Emily needs a user-friendly platform that provides guidance and basic information about different flowers, their care, and how to arrange them.
2. Inspirational Ideas: She seeks an AR flower arrangement system that offers pre-designed floral arrangements and suggestions to inspire her creativity.
3. Personalization: Emily requires a system that allows her to customize flower arrangements to match her home decor and personal preferences.
4. Budget-Friendly Options: She is interested in affordable flower options that still provide a visually appealing display for her living space.

PAIN POINT
1. Lack of Knowledge: Emily feels overwhelmed and uncertain when choosing and arranging flowers due to her limited knowledge about floriculture.
2. Time Constraints: As a busy office manager, she may not have enough time to research and experiment with different flower arrangements.
3. Fear of Waste: Emily is concerned about wasting money on flowers that may not suit her home decor or those that don't last long.

Motivation
Home Decoration: Emily's motivation is to enhance her living environment with beautiful and fresh flowers, creating a pleasant and comforting atmosphere.
Visual Appeal: She wants to add a touch of beauty and elegance to her home, making it a welcoming space for herself and her guests.
Learning Opportunity: Emily is motivated to learn more about flowers and flower arrangements to develop her skills in home decor.
Alex Turner
Graphic Designer and Freelancer

ABOUT
Alex is a young and creative graphic designer who works as a freelancer, often from the comfort of his home. He values aesthetics and enjoys expressing his artistic flair through various design projects. Although he has a passion for creativity, Alex admits to having limited knowledge about flowers and flower arrangements. He desires to buy flowers occasionally to brighten up his home studio and create a visually inspiring workspace.

MOTIVATION
1. Aesthetics and Inspiration: Alex’s motivation is to infuse his workspace with fresh and visually captivating flower arrangements that inspire creativity and boost his productivity.
2. Personal Enjoyment: As an artist, he finds joy in the process of arranging flowers and exploring different designs to add an artistic touch to his living space.
3. Occasional Gifting: Occasionally, Alex wants to purchase flowers as gifts for friends or clients to express appreciation or convey his creative spirit.

CORE NEEDS
1. Simplified Flower Selection: Alex needs an AR system that can help him choose suitable flower arrangements, considering his limited knowledge about floriculture.
2. Customization Options: He desires a platform that allows him to customize his flower arrangements, incorporating his unique artistic preferences and color palettes.
3. Virtual Visualization: Alex seeks an AR system that can virtually place floral arrangements in different spots of his home studio to assess their visual impact.
4. Affordable Options: As a freelancer, he values cost-effective solutions and wants access to affordable yet visually appealing flower arrangements.

PAIN POINT
1. Limited Floriculture Knowledge: Alex feels unsure about selecting the right flowers and arranging them effectively to achieve visually appealing compositions.
2. Time Constraints: As a freelancer, he juggles multiple projects, leaving him with limited time for shopping and experimenting with flower arrangements.
3. Limited Budget for Floral Decor: He is concerned about the cost of frequent floral updates for his home studio, as he needs to balance it with other creative expenses.

Motivation
Aesthetics and Inspiration: Alex’s motivation is to infuse his workspace with fresh and visually captivating flower arrangements that inspire creativity and boost his productivity.

Personal Enjoyment: As an artist, he finds joy in the process of arranging flowers and exploring different designs to add an artistic touch to his living space.

Occasional Gifting: Occasionally, Alex wants to purchase flowers as gifts for friends or clients to express appreciation or convey his creative spirit.
Design solutions
POTENTIAL IDEA

1. Implement interactive, step-by-step AR tutorials and guides that teach users the basics of floral arrangement. Incorporate a feature that suggests flower types and styles based on occasion or preference, making the process educational and user-friendly for beginners.

2. Provide a feature within the AR system that allows users to create custom bouquets using a selection of individual flowers. This DIY approach can be more cost-effective, as it eliminates the premium charged for pre-packaged bouquets and gives users the freedom to choose less expensive flowers.

3. Utilize AR technology to enable users to virtually place floral arrangements in their homes before making a purchase. This feature can show how different arrangements look in specific locations, assisting in making an informed decision about the size, style, and color of the arrangement.

4. Design the AR system to be efficient and straightforward, with quick response features and easy navigation. Integrate a 'quick select' option that recommends arrangements based on user preferences and past selections, reducing the time needed for users to make decisions.

5. Ensure the AR interface is intuitive and user-friendly, with clear instructions and guidance. Offer an introductory tutorial on how to use the AR features, and include easily accessible support and FAQ sections within the app for users new to AR technology.
1. Environment analysis

By wearing AR glasses and open this system, to scan the surrounding environment, analyzing the scene, atmosphere, color tones, needs, and any other things of the environment, to provide a arrangement ideas that is adapted to the environment.
2. Flower information card

This system can provide some basic information about the idea bouquet, such as style, suitable occasions, price and so on, to help users to make the final decision on the idea.

The following videos are from the perspective of a user wearing a pair of AR glasses.
The following videos are from the perspective of a user wearing a pair of AR glasses.

3. Simulated placement

This system could be used to visualize how a flower arrangement would look in a particular space, allowing people to experiment with different designs and color schemes before making a final decision. This could save time and resources, as well as help people achieve a more cohesive and harmonious look.
4. AR Arrangement Tutorial

After selecting the appropriate idea and preparing the flower arrangement materials, users can enter the AR flower arrangement tutorial. The tutorial uses AR intelligent scanning and analysis of the user's actions to achieve fully automated interactive guidance. The tutorial is easy to understand and eliminates the need for cumbersome operations such as fast-forwarding or rewinding that require users to free up their hands.

The following videos are from the perspective of a user wearing a pair of AR glasses.
GESTURE INSTRUCTION

Considering that it’s difficult for people to use electronic devices such as phones while doing flower arrangement, this system can be operated entirely through scanned gesture movements to execute corresponding commands.
Final Work

https://drive.google.com/file/d/1O0g52lt7eVRRnM60W2mY9vRot0xTVh81/view?usp=share_link
BRIEF INTRODUCTION:

Florist is an AR flower arrangement system, which people can use by wearing AR glasses to get help on how to prepare a suitable bouquet.

INSPIRATION:

Each type of flower has its own distinct appearance and unique language of flowers, conveying different emotions. Floral knowledge is very systematic and complicated.
As a girl who loves buying flowers as decoration and gifts for others, I decided to design a flower arrangement system to help people solve problems related to flower selection and how to arrange flowers.

RESEARCH

Because I want to gain a better understanding of people’s demand for purchasing fresh flowers and their knowledge about flowers, I visited several offline flower shops and conducted a survey. Based on my research, I found some problems with purchasing bouquets at flower stores.
1. Most people are not very knowledgeable about flower arrangements. Most people who buy flowers at physical stores tend to purchase packaged bouquets, and only a few buy fresh flowers to arrange at home.

2. Most people like flowers, but many of them do not buy very often because they think arranged flowers are too expensive.

3. Loose fresh flowers in supermarkets are cheaper, but many people don't know how to arrange them.

4. There are some people who feel uncertain about which flowers are suitable for certain occasions, so even when they buy well-arranged flowers from a flower shop, sometimes they still feel that the flowers don't match the environment.

**PROBLEMS**

**DESIGN IDEA**

1. Design an AR system that can use AR technology to scan the environment, then analyze the environment to match the most suitable bouquet.

2. This AR system also can provide the flowers information for users to help them with their decision.

3. This AR system also can provide AR flowers arrangement tutorials.

4. This AR system should also help people find the best place for their flowers.

**TARGET USERS**

1. People who want to buy flowers to decorate their living environment but do not have extensive
knowledge about floriculture.

2. People who want to buy flowers as gifts to express their feelings do not have sufficient knowledge about flower arrangements.

3. People who are interested in flowers think that the well-packaged flowers in flower shops are expensive.

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**PERSONA**

**Emily Johnson**
Office Manager

**ABOUT**
Emily is a busy professional who recently moved into a new position. She has always enjoyed cooking and baking, and is looking for a new creative outlet to try. Her new role allows her to work with flowers, which she is passionate about. She is looking for a way to incorporate flowers into her daily life and to learn more about their care and maintenance.

**MOTIVATION**
1. Home Decor: Emily is motivated by the idea of creating beautiful home decor using flowers and other natural elements.
2. Personal Expression: She wants to find ways to express herself creatively through flowers.
3. Learning: Emily is excited to learn more about the science and art of floristry.

**CORE NEEDS**
1. Quality and Selection: Emily values high-quality flowers and wants to be able to choose from a wide variety.
2. Knowledge and Education: She is interested in learning more about the care and maintenance of flowers.
3. Personal Attention: She enjoys the personal touch of a local florist.
4. Affordability: Emily is looking for affordable solutions that fit her budget.

**PAIN POINT**
1. Time: Emily is often busy and wants solutions that are quick and easy to use.
2. Budget: She is looking for affordable solutions that fit her budget.
3. Selection: She is interested in finding unique and creative arrangements.

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**Alex Turner**
Graphic Designer and Freelancer

**ABOUT**
Alex is a young and creative graphic designer who uses flowers and other natural elements in his work. He enjoys the natural beauty of flowers and uses them in his designs to create visually appealing compositions.

**MOTIVATION**
1. Aesthetic Appeal: Alex is motivated by the beauty and color of flowers and wants to incorporate them into his work.
2. Creativity: He enjoys experimenting with different arrangements and designs to create unique and original pieces.
3. Personal Connection: Alex also finds that using flowers can create a personal connection with his audience.

**CORE NEEDS**
1. Easy to Use: Alex is looking for products that are easy to use and require minimal maintenance.
2. Quality: He values high-quality materials and wants to ensure that his designs look their best.
3. Affordability: Alex is looking for affordable solutions that fit his budget.

**PAIN POINT**
1. Time: Alex is busy and needs solutions that are quick and easy to use.
2. Budget: He is looking for affordable solutions that fit his budget.
3. Selection: He is interested in finding unique and creative arrangements.

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**ACTION FLOW**
Goal: The primary goal of Florist is to help people get the most suitable bouquet easily, so the system should be very simple and easy for people to use.
3D models

DESIGN SOLUTIONS
The following videos are from the perspective of a user wearing a pair of AR glasses.

1. Environment analysis

Using AR glasses to scan the surrounding environment, analyzing the scene, atmosphere, color tones, needs, and any other things of the environment, to provide a arrangement ideas that is adapted to the environment.
2. Simulated placement

This system could be used to visualize how a flower arrangement would look in a particular space, allowing people to experiment with different designs and color schemes before making a final decision. This could save time and resources, as well as help people achieve a more cohesive and harmonious look.

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After selecting the appropriate idea and preparing the flower arrangement materials, users can enter the AR flower arrangement tutorial. The tutorial uses AR intelligent scanning and analysis of the user's actions to achieve fully automated interactive guidance. The tutorial is easy to understand and eliminates the need for cumbersome operations such as fast-forwarding or rewinding that require users to free up their hands.

GESTURE INSTRUCTION

Considering that it's difficult for people to use electronic devices such as phones while doing flower arrangement, this system can be operated entirely through scanned gesture movements to execute corresponding commands.

Final Work


