

# From Music Creation to Perfume Making: Design of the Interactable Fragrance Player

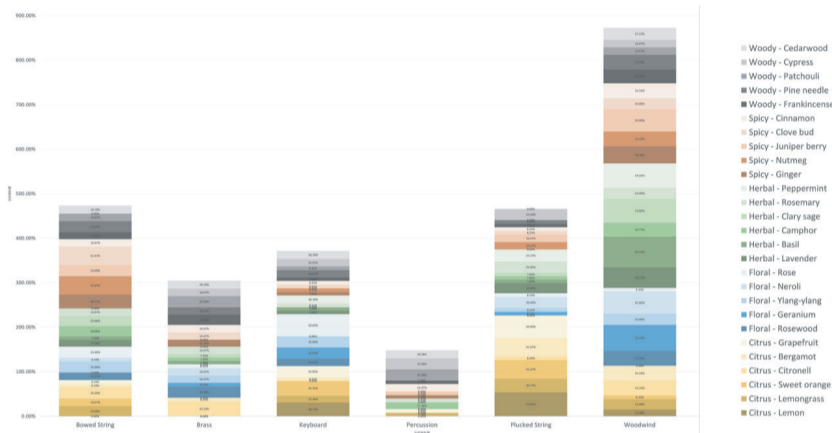
by Stoney Tianshi Xie

## Abstract

The purpose of the design is welcoming everyone to create their own special fragrance throughout the working flow of interactive platforms on the fragrance player. Human's five senses are intimately connected when we perceive the out world--this is the synesthesia phenomena. I aim to explore further the footsteps of previous studies about interconnectivity between auditory perception and olfactory perception. With conduct of survey, on-site lab experiments, lab analysis and persona analysis, the research results help develop the decision tree on how to transit music input contents into personalized fragrance output.

## Research Methodology and Results

Survey covers questions about daily olfactory experiences, stress intensity, effective relieves, and olfactory tendencies. The survey size is 50. Over 90% experienced people find aroma steam is an effective stress uplifting way, while doing a variety of other activities. In lab experiments, all 20 participants score each of 30 odors on four separate scales--from bitter to sweet, sour to alkaline, cold to warm, and light to intense. Participants are also asked to arouse synesthesia when going across the boundaries from auditory artistry to olfactory artistry. They map natural fragrance keys--spicy, herbal, floral, citrus, woody--to certain types of instrumental timbres--woodwinds, strings, etc--which results in the following data visualization:



Certain choice of music orchestration may lead to particular tendency of essential oil ratio in fragrance. Trends in market fashion are predictable if enlarging the size.

## Design Diagrams

### Hardware Improvements

The initial design contains three semi-sector-shaped platforms on the lower ground of the diffuser. Whichever platform to operate with will be corresponding to the requesting functionality, the structure leads to high cost and operating complexity. Backstage support and customer services could face great challenges. Therefore, improvements have been managed to remove the digital platforms from the lower ground. Now users may switch the aroma diffuser remotely.



### Main Functionalities

Three major functions display on the app working flow. The diffuser is capable of producing fragrance in a distinguished recipe based on special user input that reflects on his/her physical and mental status. The user could choose to make their personalized fragrance through either Musician Mode or Non-musician Mode, into either aromatherapy steam (spray right away) or bottled perfume (ordered on app). "Musician Mode" is to created personalized fragrance through music composing. Step by step, the user is asked to pick his/her preferred musical orchestration-- for example the set of piano concerto, play the melody for the instrument on the digital keyboard, and select preferred playing technique or vibe. This collected musical information is transmitted into sequences that will be further processed as personalized fragrance blend recipes. "Non-musician Mode" fragrance making is designed for users who tend not to request through music composition. Their inputs are basic inquiries as what they are doing and how they are doing at the instant. Blend recipes are highly responsive to their behaviours and moods, referring to aromatherapy literature review. Diffuser will "Duo Player" is an additional functionality that releases simultaneous aroma steam as recognizing the soundtrack. All need to do is to connect the diffuser's music player to bluetooth on the phone.

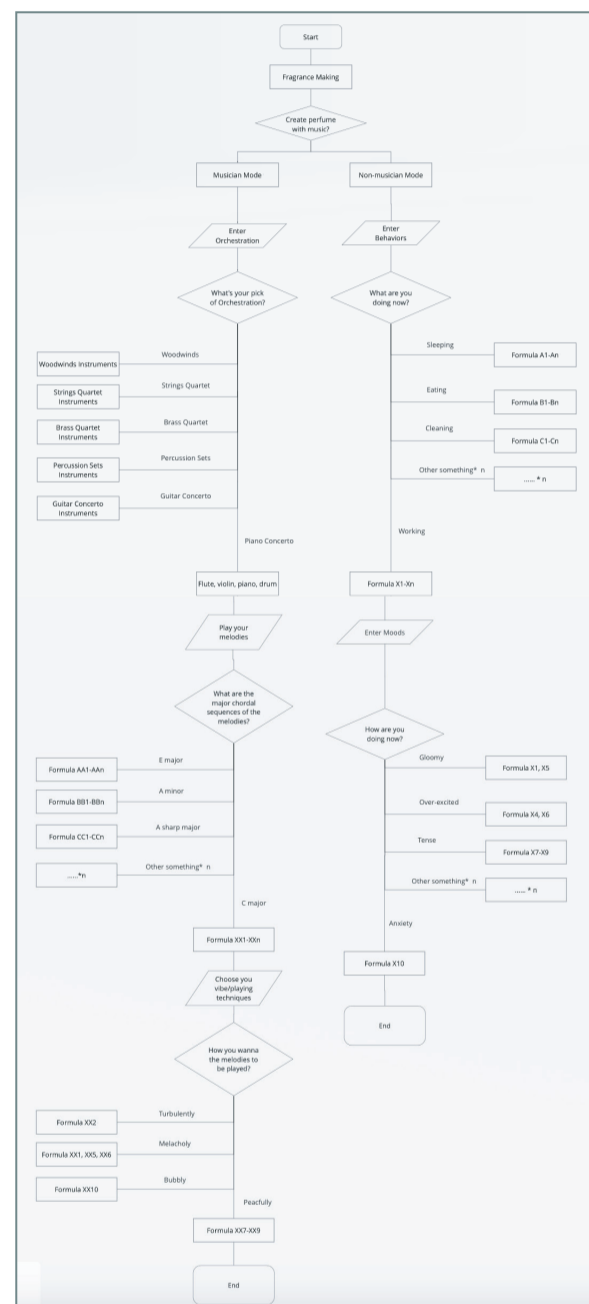
## Background

The dig into such an interdisciplinary course field has been addressed by generations of scientists. In 1875, Septimus Piesse brought about a more multidimensional approach to describe the world of smells. Piesse proposed that "sounds appear to influence the olfactory nerves in certain definite degrees". According to his theory, a harmonious fragrance can be composed by bringing together those odor notes on the taxonomy thus corresponding to harmonious musical chords. In 1927, Crocker and Henderson tried to describe different scents using scoring methods. It is to classify odors in four primary descriptive components: fragrant, acid, burnt, and putrid, with each component being given a score from 0 to 8.

## User Evaluation

### Decision Tree and Algorithm Basics

This is the completion of algorithm logic flow for Fragrance Making functionality, containing the two branches of "Non-musician Mode" and "Musician Mode".



### Guerilla Testing and Usability Testing

Guerilla testing is very helpful for improving the completeness of prototypical functionalities. A few points had been fixed after the completion of guerilla testing in size of 25 (in the middle of high-fi): 1) Not too clear where to adjust the fragrance amount. 2) Unclear points on whether users shall choose the music vibe they feel like, or they wish to hear. 3) It shall provides entry to interact and communicate with other users, as well as introducing to fashionable trends.

## Conclusion and Future Studies

User evaluation on how effective the recipes are may take weeks and months. Due to the variety of body issues and lack of materials, I will not be able to test how efficient and effective the personalized formula to the particular persona. What should be the baseline (default) setting to give fragrance advice anyway? How to optimize the idea of recipes to health issues is however a PhD thesis, as we may want to enlarge the lab size and market capacity for future studies. To complete the entire database and process corresponding fragrance formula, requires the machine learning bases to tandem thousands of logic sentence behind each trail of user choice. Deeper understanding on decision tree coding languages are sought.