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# RIT

## **Cat-Oriented Design: Redesigning the Living Space for Cats for Travel**

By

**Daheng Tong**

A Thesis submitted  
in Partial Fulfillment of the Requirements  
for the Degree of  
Master of Fine Arts in Industrial Design

School of Design  
College of Art and Design  
Rochester Institute of Technology  
Rochester, NY  
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## **Thesis Committee**

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# Cat-Oriented Design: Redesigning the Living Space for Cats for Travel

Daheng Tong

## **Abstract:**

In recent years, increasing numbers of people keep cats, especially young people who study or work away from home. Having a cat can provide them with warmth and company when they are lonely. But keeping a cat also brings problems and responsibility, especially for young people, who move often and change jobs frequently. Moving with a cat is not easy for the cat or the owner. For cats, during the journey, any change in the environment can be frightening, and some of the more serious uncertainties can even lead to death. For the cat owner, in addition to having to carry more cat supplies, worrying about cats during a long journey can be unsettling. The project discussed in this paper was researched and designed to provide a better solution for traveling with a cat. This will help the cat and the owner. The testing showed that this newly designed system provided cats with a comfortable living space during air travel and ease for the owner as they can interact with their cats.

**Keywords:** Cat transport, Design for cat travel, Animal cat care for travel

## **Introduction:**

This paper begins with the study of cats' habits and behaviors and takes air travel as the entry point. The project is about how a cat air-travel system can make cats and their owners more comfortable and secure in complex long-distance flights through the cat-oriented design concept. Through research in related fields, market research, and questionnaires, I found that this field has a great space for development because existing research and design products do not pay much attention to pets' travel needs. There are a lot of studies focusing on people's pet allergy symptoms, pet travel passports, vaccine-related content, and pet infection during travel but not the transport environment of the cat.

At the same time, some products on the market are designed to be portable and attractive. However, there are few research studies and designs on pets, and few people pay attention to the feelings of pets and the emotional relationship between owners and pets. There is a lot of development needed in the area of cat travel options.

Based on this project, this paper also discusses how the cat-oriented design concept can make both the cat and the owner get a better life experience by redesigning the cat living space. Under the current situation, the living space of most pets overlaps with the living space of their owners, and the owners have no special plan for the living space of their pets. Through the redesign of the living space for pets, both owners and pets can have a better life experience.

I chose to focus on cats as I am a cat owner and have not found suitable products for cats that diminish anxiety for the cat or the owner when the cat is transported. Air travel is the most complex transportation in our daily life, so solving this problem can cover most other cat travel issues.

### **Problem Statement:**

How to design a cat air-travel system/product to help both owners and their cat's air travel more comfortably?

### **Project Overview:**

I chose to do a project that would design a new cat air travel system to solve the living space problem that cats will face during air travel. Through this system, cats can have a living space that is more in line with their daily living habits during air travel and the owner can obtain cats' conditions remotely or interact with cats to a certain extent without worrying about cats all the time. Through this system, complicated air travel for cats can be made easy. At the same time, through the research of this project, rather than human-led, this cat-led project is about how pets can have their own comfortable living space by taking pets as the core of the design.

After a preliminary analysis of issues with cats, this analysis made clear the general direction of the project. I conducted preliminary research to explore more issues in relation to cat and owner air travel. Since the target groups of my project are cats and their owners, I also adopted two different research methods. For the cat owners, I used the form of questionnaires to get their general feedback and selected two people for more detailed interviews. For cats, I made detailed observations of cats through simulated travel environments, and also conducted literature research to analyze some of their potential needs and issues.

At the same time, I also conducted a detailed benchmarking of the existing pet travel supplies market, mainly targeting cat carriers and some travel-related supplies. After analyzing and classifying the shapes, materials, and functions, I found some very good breakthrough points, such as the improvement of the shape and better spatial planning.



Fig 1. Market Research

Based on the user research and market research results, I have preliminarily constructed three key elements for this cat air-travel system: a cat carrier, a cat collar, and a mobile phone APP.

The principle of the smart collar is mainly based on the existing smart bracelet. The body data detection equipment on the smart bracelet is very mature, so I didn't need to make a special design in terms of the working principle of electronic components and detection data.



Fig 2. Test with Apple watch

On this basis, I designed the shape and material of the collar focusing on the body structure and comfort of the cat. First, since cats are woolly creatures, covering the hair of the body will very seriously affect the accuracy of the detection sensor, so after I looked at the using scenario of the existing pet cat collars, I decided to put the sensor on the side of the collar, the position most likely to come into direct contact with the cat's skin, which can detect the most accurate data. In addition, I choose cloth as the material, because it is lighter and more breathable to wear for a long-time during travel.

A cat spends all of its time traveling in a cat carrier, which is also all of its living space, so a well-designed carrier can give the cat a great travel experience. As the most important part of this cat air-travel system, I redesigned the cat carrier. In terms of the external shape, I used simple design language. The trapezoidal design makes the whole box more stable, and the side contraction provides a sense of wrapping to a certain extent, making the cat who just entered the carrier more secure. On the outer carrier body, I reduced a lot of unnecessary open space and replaced them with an integrated skylight. This design can



Fig 3. External shape of the carrier



Fig 4. Top view of the carrier

bring many benefits, such as enhanced sound insulation in which the cat is not vulnerable to many kinds of noise, and can also prevent the cat's claws from sticking through the opening and hurting. The integrated skylight design provides a continuous view for cats to satisfy their curiosity and helps them get familiar with changing environments faster. The most important of this shape design is to make the carrier for the cat more like a living space of their own, not just a container. Compared to the metal mesh doors of the existing carrier, this carrier has an additional detachable door, which gathers the required electronic components, including a heating and ventilation system and some power modules. The detachable design makes this carrier easier to use, for some short trips, owners don't need to carry this detachable door, the remaining part is also a functional lightweight carrier.

The interior of this carrier has also been specially designed for cats. On the sidewall, there are two adjustable small cat scratchboards, this design point is derived from my observation of the behavior of the cat. The cat's front paws were used to support their body when they stand up and look around, so these two cat scratchboards not only can be used as a toy but also can let the cat have a more comfortable position to observe the outside world. Compare with the current carrier, this design also allows the cat to have certain vertical movement space during long-distance travel. Meanwhile, the owner can adjust the height of the scratchboards according to the cat's body shape and habits, so that the division of space has more flexibility.

There is a module attached to a pipe on the central top of the carrier, it links to the electronic components on the door when the door is closed. This design allows for even ventilation and heating inside, which will make the inside environment more synchronous.



At the front of this carrier is the interactive device for the owner and the cat. This device consists of multiple LED lights inside the box. In a dim environment, the flashing lights are very easy to attract the cat's attention. With a programmable flicker mode, the owner can remotely adjust play mode to interact with the cat during a long, boring trip.



Fig 5. Internal shape of the carrier

The travel system also includes a mobile APP, which displays the cat's body condition, and the temperature inside the suitcase, and provides the owner with remote control of various modules, such as a heating and ventilation system, and the light games to interact with the cat. As it is difficult to transmit data during air travel, the owner can also set some functions in advance in the APP, such as regular ventilation and regular start-up of LED lights.

## **Conclusions:**

First of all, based on my preliminary research, I have a better understanding of the living habits of cats. However, most of the existing cat travel products are designed to be human-oriented, their design focuses on portability, appearance, color, and relatively low manufacturing cost. But from a cat-oriented design point of view, I felt that most of these products were not very cat-friendly. For example, cats have a normal body temperature of around 39 Celsius degrees, so most cats tend to be cold when they are in the cargo or carried into the cabin, so the heating system in the carrier is critical in such an environment. Similarly, cats are very sensitive to changes in their surroundings, and they are easily frightened. The

doors of the existing carrier almost only have a layer of metal mesh, which makes cats in carriers easily lose their sense of security, so the more integrated external design can solve this problem very well.

Secondly, this project also extends my thinking about the living space of cats. On the premise of living by the cat's habits, this carrier can help the cat adapt to a long journey faster, after the cat becomes familiar with the space, the space also becomes their living space. Therefore, I also focused on learning about cats' living space requirements during part of this project, thus making innovative designs for the interior of the carrier. Compared to existing products, the carrier in this project provides cats with more movement space, such as vertical movement space and easy support sidewalls. These make air travel not a scary ordeal for cats, but a safe and enjoyable journey.

Due to the limited time of this project, I think there are still many directions that can be further explored, such as how to solve the problems of cats' eating and excretion during travel, and how to balance cats' fear of the outside world but curiosity at the same time. I hope that I can continue to improve these problems in the future so that this travel system can become a first-class for cats.

To sum up, I think the use of a cat-oriented design concept in this project can solve many problems faced by the owner and the cat when they need to travel. I also think this design concept can be applied to more aspects, such as the redesign of the cat's daily living space. The existing cat living space is often a part of the owner's living space, and there is a lot of overlap between people and cats. However, the living habits of people and cats are different, and the existing cat living space is more based on people's needs. Therefore, how to design a better living space for cats through the cat-oriented design concept in a human-oriented living space is a topic worthy of further exploration.

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