



Georgia Institute of Technology

**HP & Intel Life in Space Challenge
Team Georgia Tech**

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Written Proposal

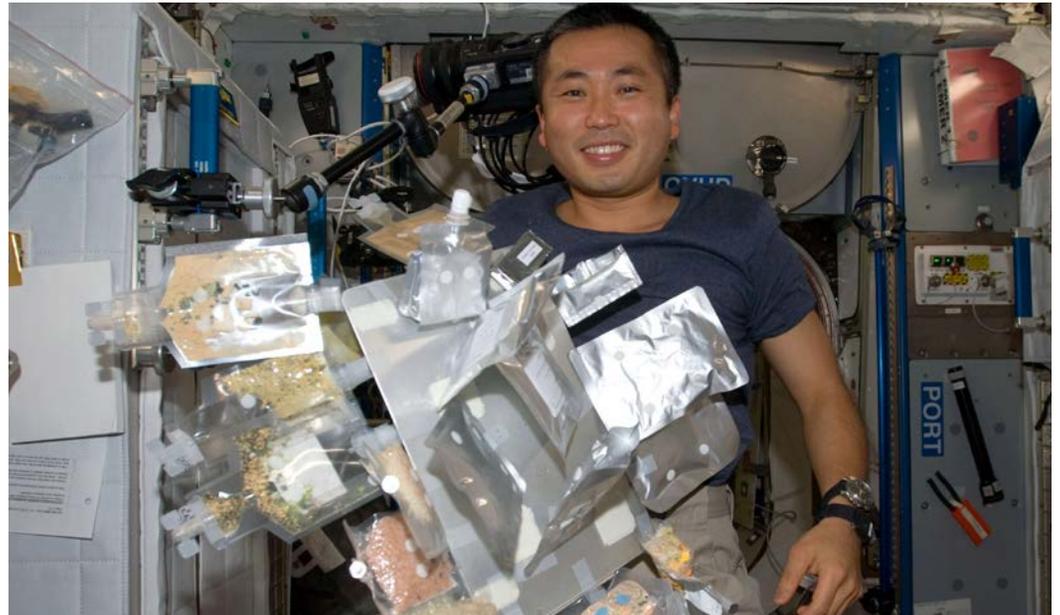
Improving life in space is no easy task. The daily lives of astronauts are planned out well in advance, often even before they reach the International Space Station (ISS). This being said, astronauts still face some interesting hardships that humans on Earth do not encounter. As students from the Georgia Institute of Technology, we approached the design brief with a broad perspective. For the idea to be successful, we researched the areas of astronauts' lives that could be improved the most. Throughout this process, we emphasized that our device must be simple to use, have a positive emotional or psychological impact on the astronauts, and must function in the zero gravity environment of the ISS.

We started by mapping out the daily experience of astronauts in the ISS and researching online resources, relying heavily on NASA's very detailed website. Thirteen overarching segments of lifestyle such as sleeping, eating, exercise, and hygiene were then categorized. After further identifying the specific challenges in each segment and current solutions to those challenges from reading astronauts' journals and watching their videos. We narrowed down our targeted areas to trash, hygiene, and food preparation. Several criteria for our design were set to evaluate each of these three areas and to decide which one would be our final focus. We believe that besides enhancing the experience of space life, the final design should also

be able to connect astronauts with home (to provide more psychological benefits). We ranked these in areas of ease of use, time efficiency of a certain task, and integration into the existing workflow. After ranking each area based on the criteria we specified, we chose food preparation and consumption as our final direction.

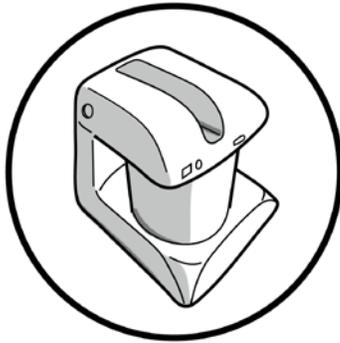
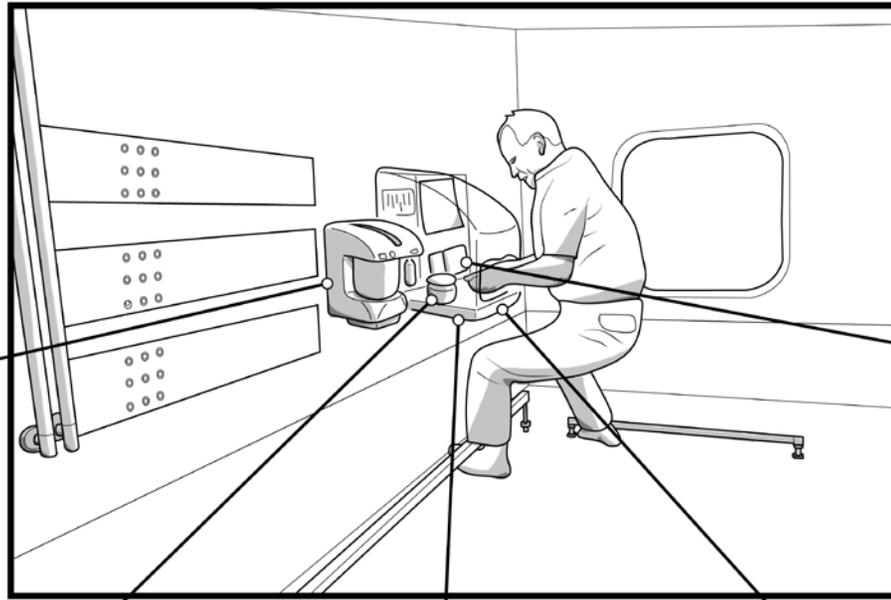
Current aerospace organizations focus on the packaging, preservation, and transportation of food. The main source of food for these astronauts are pre-packaged meals. However, enhancing the onboard experience of food preparation and consumption seems to be comparatively overlooked. Developing a solution that can enhance the cooking and consumption experience will produce various psychological and practical benefits for astronauts, such as facilitating assorted tastes to improve astronaut appetites and increase the variety of meal options, connecting astronauts to their food by interacting with the food preparation process, and strengthening social dynamics by enabling group cooking. With this in mind, our team has developed three personal targets for our final product to meet: firstly, the ability to mix foods together to provide customized assortments of taste; secondly, to facilitate preparation of food, such as cutting vegetables, in an easy and interactive manner; and lastly, to make food consumption in space more comparable to conventional eating habits on Earth. In addition to these, considerations for zero-gravity usage, feasibility in manufacture, integration

with existing food consumption methods, and limitations on space and storage on the ISS have led to our concept idea for a food preparation station. This enables an interactive cooking flow process from cutting food to customizing a multitude of tastes to delivering prepared food in an easily consumable manner.

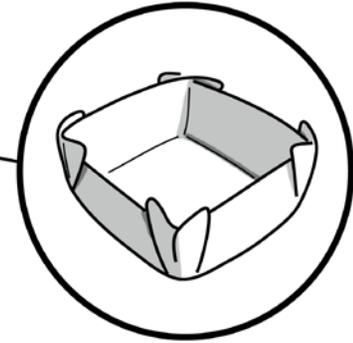


Right above and below: Astronauts report missing the experience of preparing food, though it is too logistically difficult to do so in zero gravity using current methods.

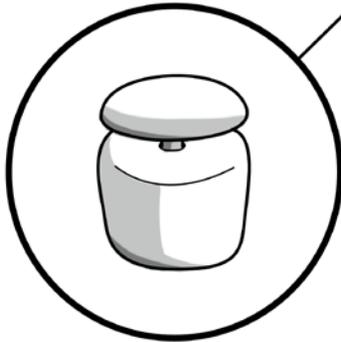
Conceptual Sketch



Use to mix food mechanically



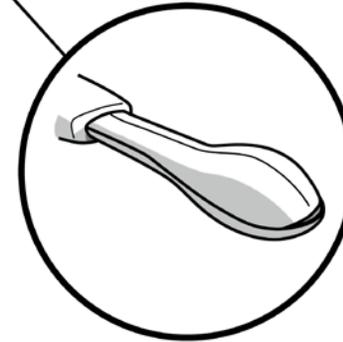
Use to eat from or mix food by hand



Safely chop ingredients



Mix different drinks



Utensil that prevents food from floating away