

A tour of

ANSIBLE: A Network of Social Interactions for Bilateral Life Enhancement



Phase I SBIR: NNX13CJ16P
Supplement to Deliverables
November 18, 2013

Peggy Wu and Jacquelyn Morie

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Supplemental booklet to accompany main deliverables

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There was a startling recognition that the nature of the universe was not as I had been taught... I not only saw the connectedness, I felt it.... I was overwhelmed with the sensation of physically and mentally extending out into the cosmos. I realized that this was a biological response of my brain attempting to reorganize and give meaning to information about the wonderful and awesome processes that I was privileged to view.

Edgar Mitchell
Sixth Man on the Moon

Every generation has the obligation to free men's minds for a look at new worlds . . . to look out from a higher plateau than the last generation.

Ellison S. Onizuka
Challenger Astronaut



Our Approach

1. Enhance space-Earth human-human social interaction and communications through a custom-made set of virtual environments

- Connecting to family and friends through events, surprises, 3D printing
- Separate family areas in the virtual world for private use
- Spaces for connecting to general public (e.g. education outreach)

2. Counter social monotony and isolation

- Engaging activities and asynchronous games
- Creative outlets such as building in the Virtual World
- Interactive individual and group Virtual Agents with programmed behaviors
- Connection with a customizable 3D avatar representation

3. Counter sensory deprivation and other habitat limitations

- Group events in The Club
- Crowd-sourced Virtual Vacations
- Nature areas, shopping and building space, virtual gardening
- Meditation facilities and programs

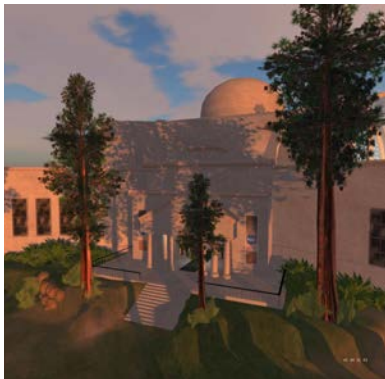
Each of these areas is supported by research that has shown the effectiveness of their use within a virtual world environment.

FAMCOM

The Family Communications Center



The Family Communications Center is built within a virtual environment that incorporates not only time of day but also many kinds of weather patterns. This provides visual reminders and a connection to familiar Earth patterns that can help ease the separation from home.





Center Hall

In the FAMCOM main foyer, a floor sculpture of the moon and its phases serves as another connection to home.

The soft glow of the foreground small moon indicates its current phase back on Earth.

Around the foyer are six themed rooms with activities for the crew. There are also three doors that lead outside to activities like meditation, concerts and shows, and nature walks.



Center Hall

Also in the FAMCOM main foyer, a hanging representation of the solar system serves to show the trajectory the mission is taking to its destination.

Here we can see the green dot indicating where the ship is along its route.

Themed Activity Rooms

Six rooms within the FAMCOM provide a wide range of activities to counteract monotony and isolation for the crew.



The Library and Music Room



Art Gallery



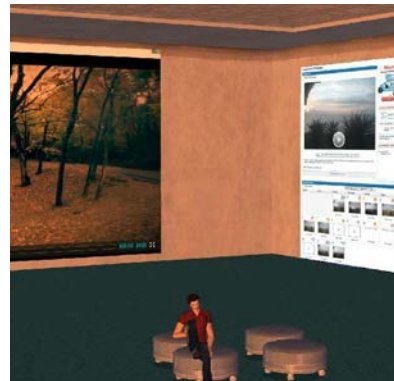
The Club



The Post Office



Virtual Vacations



Earth Links



The Library

The Library contains relaxing places to chill and watch the fish in the aquarium, play a game of chess with family or friends back home, or a round of pool with fellow crew members. There is even a piano one's avatar can play if desired.



The Art Gallery

In the Art Gallery the crew can enjoy often-changing exhibits curated for them by people back on Earth. This can be an engaging outreach program for creatives to contribute to the welfare and well-being of the mission crew. In addition, astronauts themselves could showcase their own work, such as space photography, within the gallery space.





The Club

The Club is a versatile space that may help counteract social isolation during long duration missions.

In The Club astronauts can watch a video-taped comedian perform, but, unlike watching a presentation alone on their computer screen, in The Club they are surrounded by other avatars. We call these "extra-tars" as they are programmed interactive AI agents that make the place feel lively and vibrant. These agents can laugh at the appropriate places in a comedy routine (much like the laugh track on a television sit-com), or they can be couples dancing in the space when The Club is used as a music venue. Eventually, the agents could carry on conversations with crew members visiting this place. In the next phase of the project, we can add reaction tracks of friends and family, so crew members and their loved ones can watch shows "together", albeit asynchronously.

The room can be set up to let a crew member take a turn at being a DJ, or even being a stand up comic themselves!



The Post Office

This is the communications hub of FAMCOM. While standard email won't be found here, special forms of communication will be, such as virtual care packages and surprises friends and family leave for each other.

Files that contain printable 3D models can be sent and received here. The files can then be sent to a 3D printing device (on board or on Earth) with a click of a button, enabling crew and Earth-bound family and friends to send tangible items to each other despite the vast distance between them.

Additionally, the Post Office will host a series of asynchronous games designed to keep family connected, such as our first "Positive Memory Game."

The room can also be the starting point for virtual scavenger hunts and many other shared activities.

Asynchronous Positive Memory Game



A player starts the Memory Game by clicking on the sign. He or she types in a positive memory that their family member will have to guess from clues provided.



They can then choose clues from a library of images sorted by categories like location, person, event, activity, or season.



After the clues are provided, it is the family member's turn to try and guess the memory. Once they submit their guess, the first player has to determine if they guessed correctly. Leaderboards can keep ongoing scores for motivation and encouragement.

The Earth Links Room

This space contains maps that are updated during the daily synchronizing process between Earth and the spacecraft. This means that astronauts can see recent images of weather and photos from back home. We envision a google-maps like application, but one that can be populated with photos uploaded by family and friends.

One wall is devoted to videos showing scenes from the current season back on Earth. that can be played on demand. This is another great opportunity for crowd-sourced (and NASA vetted) content.





Virtual Vacations

Being able to escape the confines of the space craft, even if virtually, can be a strong countermeasure for sensory deprivation and isolation. We envision these virtual vacations being an ever-changing selection along several themes. They can be provided by creative people back home who submit them to NASA for potential inclusion in the Virtual Vacations space.

Themes can include: Fantasy, Narratives, Ecological or Nature vacations, Travels to Exotic Realms, Historical Re-creations, and even favorite back-home experiences and places on Earth we call Click 3X.



Private locations for each crew member and family



Scenes from a private family residence in the virtual world.



Teleport link to private space



Within the FAMCOM there are individual teleport hubs that crew members can use to travel to a private region in the virtual world.

Within their region they can build a new house or customize an existing structure to serves as a private meeting space for family members.

Pre-fab homes and rooms in many styles are available in the virtual malls, all free. The home shown on the opposite page was put together from mall offerings in about an hour.

Crew and family can spend as much (or as little) time as they want building and decorating their private spaces, including holiday additions like Christmas trees or Hanukkah presents.

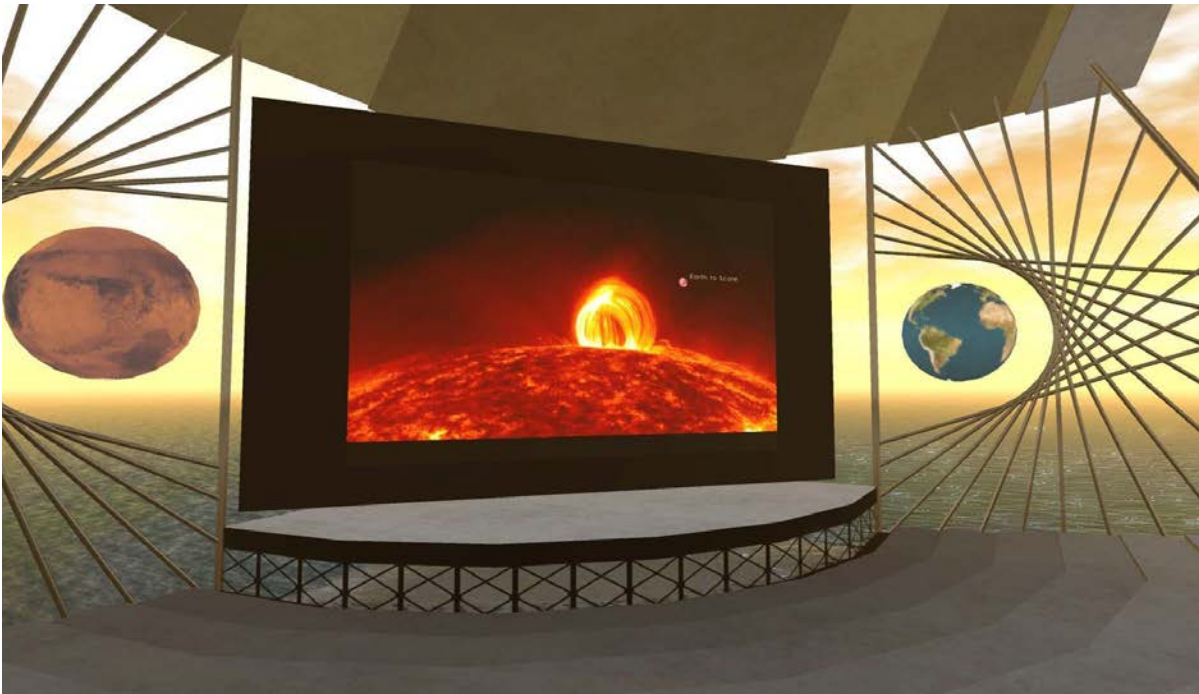
Outside Activities

On the main ANSIBLE island, there are several outside activity areas designed to provide variety, nature and relaxation.

A large amphitheater can be used for viewings of videos, messages from home, or educational outreach. It can connect to and display any video that has been uploaded and synchronized to the space craft's Virtual World server.

The grounds are beautiful to stroll around, and offer a multi-sensory experience including sounds of the wind, waves, and constantly changing wildlife, including birds and crickets. One could even play with a virtual pet in this area.

A Meditation Gazebo on the grounds is programmed with Mindfulness meditations, and a Zen garden provides tranquil contemplation.





One of the three doors to the outside areas



The Meditation Center



Enjoying a campfire



Among the giant redwoods



A Zen Garden for contemplation



Gardens can be shared with loved ones

Shopping Malls and Creativity



At least three fully stocked shopping malls are included in the ANSIBLE virtual world, providing a wide variety of goods, from avatar parts to plants to furniture. There are also coffee shops in the malls and outdoor areas.

These malls allow participants to easily create or customize interesting places, such as their private residences, or an environment for a hidden object in a scavenger hunt.

In-world building, modeling and texturing tools can be used to create almost anything, allowing for maximum creativity.

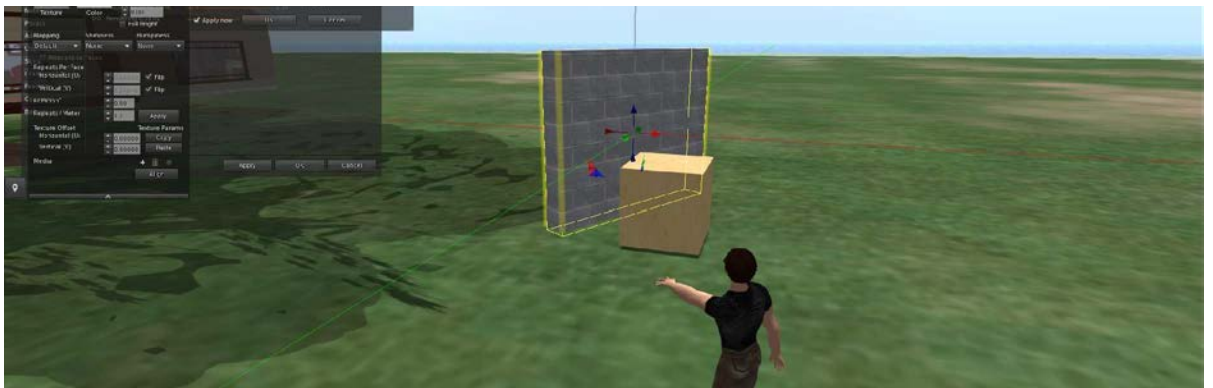




Another of the three available malls



This open-air market features all styles of full rooms and furniture choices.



In-world tools can be used to build almost anything!



We hope you have enjoyed this brief tour of the ANSIBLE Virtual World space. This booklet is meant to accompany the full deliverable of the virtual world itself, the video documentation, and the supporting research that has gone into the development of this functional virtual environment.

Further development is planned for more robust AI Agents that can serve a variety of in-world purposes, from real-time conversational and game partners, to support staff that can augment the ground control personnel during the long communication delays that will be encountered on long space missions.

One such character is shown above. This is a simple Virtual Agent who serves as a tour guide and tells participants about new changes to the virtual world since their last visit.

In our next phase of work we plan to test what we have built in an analog facility, to obtain feedback from actual users. We also will use that time to get the synchronizing technology for the Earth-based and Ship-based virtual worlds to be automatic and robust so it can work well through the extent of a long duration mission.

ANSIBLE can be used inflight, as well as pre-flight and post-flight to keep crew and family and friends connected in future space missions. We have found this project to be exciting and rewarding, and would like to acknowledge our NASA program sponsor, the Behavioral Health and Performance element, specifically Brandon Vessey, Diana Arias, Lauren Leventon, Laura Bollweg, and Holly Patterson, as well as Walter Sipes and Albert Holland for their support, expertise, and insight.

CREDITS

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