xenoergonomics

The Desk

Image
1. Perch
2. Writing surface
3. Table
4. Drawers
5. Shelves

This is the most natural "sitting" position for a yinrih. This piece of furniture, most similar to a human chair and desk, emulates a branch.

The drawers and shelves are accessed by the tail and rear paws. The yinrih make greater use of tactile information than humans, as they use their rear paws and tail almost as much as their front paws to grasp objects. Items are made to be more tactily distinct so they can be identified by touch alone.

I promise yinrih actually have four legs, I'm just bad at drawing the two rear legs. I'm also still up in the air about the proportions of their rear paws and lower legs. I want the yinrih to be equal parts canid and monkey.

Drinking Vessels

Image

Humans have very nimble lips compared to yinrih. We are capable of making an airtight seal with our lips (for all practical purposes, anyway), but a yinrih's chops hang loose like those of a dog.

Yinrih drink by putting the tongue in the liquid, forming a spoon shape with the tip of the tongue, scooping up a bit of liquid, and drawing the tongue back into the mouth.

So how do you make a drinking vessel that accommodates this behavior?

It has to be wide enough to fit a yinrih's muzzle. The tongue has to be able to reach the entire bottom surface of the vessel to lap up any remaining liquid, and it has to avoid liquid getting everywhere during the course of drinking.

Pictured above is a possible solution the problems listed above. While the picture is more narrow like a glass, in reality it would be a bit wider, closer to a bowl. The bottom is rounded to allow the remaining liquid to pool at the center, and there's an inward-pointing flange around the lip of the vessel to prevent spillage.

Drinking in microgravity is a bit trickier. Human astronauts use straws, but yinrih can't form a seal with their mouth as stated above, and can't create negative pressure in their oral cavity to suck liquid through a straw. I suspect it would involve something similar to the water bottles you see in rodent cages, where there's a ball bearing forming a seal , and licking the ball causes water to seep out. Those work on gravity, but the ones used by yinrih spacers might use positive pressure.

If I had a 3D printer I'd make one of these and see if it worked with my dog. Sadly, I don't.

Shoes

Yinrih are not accustomed to wearing shoes. They find the loss of tactile information unpleasant. Yinrih that have to walk while wearing something that covers the palms of their paws initially react about how you'd expect a dog to react when wearing boots for the first time. This includes donning paw gauntlets when wearing powered armor.

Xenoergonomics: Vehicle Cockpit

Image

The operator lies on his back in the chair and grips the keyers in his paws. Analog controls are located at the base of the chair. Output is provided by HUD specs, usually in a visor form factor for a wider field of vision.

This arrangement is used not only in vehicles, but as workstations in offices, usually without the analog controls.

Paw Coverings

The yinrih's hatred for footwear truly knows no bounds. Hot pavement? Make concrete with a very high albedo so it doesn't absorb heat from the sun, or plant shade trees along walking paths to prevent the sun from shining on the path altogether. And what about Hearthside's Nightless Desert? Hearthsiders smear an insulating wax on their palms to keep the sand from burning their paws. Luckily, only Hearthside, Sweetwater, and Yih are close enough to Focus for this to be a problem. No amount of terraforming will make Focus any brighter on Newhome and beyond.

Why do yinrih hate wearing shoes? They rely much more heavily on tactile information than humans, and covering the paws is akin to wearing a blindfold. People who have to cover their paws for extended periods, such as soldiers and law enforcement wearing powered armor, must become accustomed to the loss of tactile sensation that come with wearing paw gauntlets.

The only time yinrih do wear paw coverings is when hygiene is a concern, when their's risk of lasting injury (heavy objects crushing the digits, etc), or when the paw coverings would enhance mobility, such as force projectors allowing the climbing of smooth vertical surfaces.

When paw coverings are worn, the claws may be accommodated in a number of ways. The ends of the digits may simply be left open to allow the claws to stick out, or there may be metal or plastic claw covers. Some are blunt while others mimic the shape of the claws, preserving some of their functionality. There may be a removable cap on the writing claw to allow the wearer to write while shod.

In addition to force projectors on the digits and palms, paw gauntlets have control rings on each gauntlet. These are located on the digits next to the inner and outer thumbs. The two thumbs can perform a few simple gestures, like taps and directional flicks, to actuate suit functions. Both the forepaws and rear paws possess control rings, giving a total of eight.

Ladder Wells

Image

Going up, analog style. Since yinrih are arboreal, climbing is second nature to them. While stairs may exist, for example, separating the nave and sanctuary of a lighthouse, ladders are the preferred way to ascend when elevators aren't available.

Since a single paw can support the weight of the entire body, the rungs of the ladder also act as a hand rail, as long as the yinrih keeps one forepaw holding onto a rung, they won't fall very far if another paw or the tail should lose grip.

They can cary small objects, such as parcels and bags, in their tail as they climb.

The ladder well is located in its own room to prevent people from stepping into the well and falling down on accident. The ladder between each floor is staggered so that if a person does fall, they land one story down. A single-story fall will be painful and perhaps temporarily incapacitating, but there's no lasting damage. In any case, it shouldn't be any worse than a human falling down a flight of stairs. It's also easier to retrofit ladder lifts for the elderly, as it just goes straight up.

Yinrih Wallet

Image

Yinrih often wear a pocketed band around the right foreleg that serves as a wallet and coin purse. They're fairly easy to pickpocket in a crowd, as it's trivial to slip a paw into one of the pockets while walking by, and most pockets are sealed with magnetic latches that are quick to open and close with a single paw. Zippers or snaps may also be used, and those are harder to operate without the victim knowing, but are more fiddly to use with the single paw available to the wearer.

Thieves with more resources may use repurposed sport micro mechs to slip into a pocket and grab a few things without even being present.

Mech Cockpit

Image

Here's a mech cockpit. The forward seat is for the pilot, who drives the mech and handles main weapons. The rear seat is for the squire, who maintains the mech's systems and sometimes handles secondary weapons. The paw keyers may have gyroscopes and accelerometers to allow for a degree of motion control, although not to the extent afforded by paw gauntlets, which aren't used because there's a lot more going on with a full-sized mech compared to a micro mech.

Full sized mechs aren't piloted remotely because there's input lag and a loss of situational awareness that comes with remote sensor feeds. In or out of combat, you need to be on top of things when controlling a multi-ton machine.

Yinrih Backpack

Image

Here's a yinrih wearing a backpack. He wasn't supposed to be so chubby but eh.

There are LOTS of pockets. They're sealed with magnet flaps. The main compartment opens from the rear, and there's a ring attached to a zipper to allow access with the tail.

I suspect the pockets on the chest are accessed with the front paws, and the pockets on the side are accessed with the rear paws, so items that you want to be immediately accessible would go in the chest pockets.

Backpack take 2

Image

I think I'll keep the other picture up just to show progress, but the legs and tail were really bugging me. I also want to redo the picture of the amnion. The harness is way to simple, as is the main body of the capsule. It's not literally a sphere, I just suck at drawing.

Ear Guards on a Healer's Cloak

Image

Here's a possible solution for how the ears would be protected with a healer's cloak. Draping cloth directly on the ears would be irritating, so a cardboard or plastic band is sown into the cloak with ear guards that are supported by the band, keeping the cloth from rubbing the ears. The only drawback is that it keeps the ears from swiveling, but that's also true of the ear guards on powered armor.

Another Ear Guard Design

Image

This one holds the cloth above the ears and allows the ears to swivel.

HUD Specs and Earpiece

Image
Here's some HUD specs and an earpiece for audio output. The HUD specs use a minimal, mostly text-based, UI. This is due to the very low data rate required by FTL communication. All the microelectronics sit in the muzzle bridge.

The earpiece may use bone conduction since it's hard to get passive acoustic isolation with all that fur in the way.

I used a reference image for this one. Didn't trace it though. I'm told that's a big no-no. Since it's literally just a dog's head, the back of the neck doesn't quite look right, or maybe it's fine, IDK. Getting primate limbs on a canine body is proving difficult, especially given both their front and back legs are supposed to have the same range of motion as a human arm.

Drinking Bowl

Image

Here's a typical drinking bowl design. A flat bottom to allow it to rest on a tabletop, a flange around the rim and a smaller ridge around the middle to help the tail wrap around the bowl for easy carrying, and a broad bottom to allow the muzzle to comfortably reach all the way to the bottom.

Yinrih cut their food into bite sized pieces before eating it. A simple meal is usually presented as a sort of meat salad, with chunks of meat mixed in with leafy greens and diced veggies. Liquid dressings also feature, and there's a smooth gradient between a completely dry "salad" and a "soup" that's mostly liquid.

Cuisine varies by region, but some common threads are an emphasis on temperature and texture--mouth feel--over flavor, and presenting the food in a way that it can be eaten without the palms of the paws contacting the food directly. Cultures vary on whether the bowl stays stationary while the diner brings his or her snout to the food, or whether the diner brings the bowl up to the mouth.

Capsaicin and menthol (or rather analogous compounds) feature quite heavily, often in the same dish. By "heavily" I don't just mean one encounters spicy or minty foods often, but that "hot" or "cold" is the only thing a human is likely to taste because those sensations overpower any other flavors. If other flavors are meant to be present in a dish, humans find them overpowering because yinrih need to use more of a particular flavor to make up for their poorer sense of taste compared to humans.

Where hygiene isn't as much of a concern, there is so-called "tail food", which is meant to be eaten while standing, with the food held in the tail. Snacks and junk food often take this form. Other snacks, such as marshmallow-like cubes of congealed cream, are meant to be pierced by a claw as one would use a fork and popped into the mouth.

Another Tail Gesture Ring Design

Image

A slightly modified tail gesture ring design. This time done in Plasticity rather than Blender. Plasticity is more CAD-like, so it makes modeling tech a bit easier.

Some Pictures

Image

A musical instrument played by the tail.

Image

A spacer terraboo.

Xenoergonomics: A Bottle of Nose Balm

Image

OK, let's wash that digital abomination out of our brains with an attempt at visual art by a human.

This is a bottle of nose balm. It's fairly representative of pill bottles and other similarly sized containers. The only real curve ball compared to its Terran equivalent is the ring on the cap. The ring serves two main purposes.

For yinrih who live planetside, the ring helps them fish the bottle out of a backpack with their tail. For spacers, the ring is slipped on one of the digits while the bottle is open and in use in order to keep the lid from floating away without having to sacrifice an entire paw just to hold the lid. The outer thumb is used most often for this purpose.

A more subtle feature of these sorts of containers is the texture on the lid. It's not just there for grip. It also helps the yinrih identify the bottle by touch alone. The texture, together with the overall size, shape, and mass of the bottle, differentiates it from other similar containers nearby.

There are other similar items that a yinrih typically keeps on their person, whether in a wallet around the right foreleg or a larger bag on the chest, back, or belly. Paw wax protects the paw pads against surfaces that are hot or have irritating chemicals. perfumes as well as perfume remover (for when one's natural musk is deemed more appropriate) are packaged similarly. There are salves for treating minor cuts, which act to both treat the wound and cover it like a bandage.

Sketch of a Yinrih Bathroom

Image

1. curtain
2. washing pool
3. dirty area
4. tiled floor designed for tactile aesthetics
5. perches
6. latrine
7. stall partitions
8. grate for flushing the toilet and sanitizing the stall.

Paw keyer

Image

I've shown a couple images of HUD specs. Now here's the input to go with the output. The keyer proper looks like the molded rubber grip of a bicycle handlebar. Running across the top of the keyer proper is a cushion that conforms to the contours of the wearers paw pads. On the bottom of the keyer body are four grooves shaped to fit the four middle digits, each with a button. Flanking this row of buttons are two thumb clusters, each with a button or two as well as a trackpoint. A strap goes all the way around the keyer. the paw slides through the top, and the wearer curls their fingers down and through the bottom part of the strap. There is a knuckle cushion on the strap that presses against the ground as the wearer walks.

YSO (Yinrih Standards Organization)

The standard direction for vulpithecine screw threads is reversed compared to humans. It's counterclockwise to tighten and clockwise to loosen. Clocks and gauge dials are also reversed.

This is due to two things. For clocks and dials, it's because the yinrih primarily inhabited the southern hemisphere of Yih, where the shadow cast by a sundial moves in the opposite direction compared to the northern hemisphere. When mechanical clocks were invented, they mimicked this movement, meaning that yinrih "clockwise" is human "counterclockwise" and vise-versa. For screw threads, it's also because yinrih are primarily left-handed.

The post title is a pun on the ISO, which I just learned doesn't stand for International Standards Organization or similar. Oh well.

Vertical Treadmill

If humans are natural distance runners and running/jogging is a common form of exercise, that it should follow that since yinrih are climbers then climbing should be a common form of exercise.

I've already mentioned that yinrih use ladders rather than stairs. I can see monkey fox gyms having a vertical treadmill as well as other climbing surfaces.

Torpor alcoves

I've moved the wiki off of Cloudflare. It may take a bit for me to get it back up. The wiki itself isn't going anywhere. I self host it on a 15 year old laptop. What's moving is the reverse proxy server that's open to the internet.

I've mentioned before that homes on orbital colonies are transportable modules that are semi-permanently attached to the colony via an airlock. Homes on Welkinstead are condominiums or apartments, integrated into the structure of the city and either rented or purchased, probably leased long-term from the city rather than bought outright.

Yinrih don't have bedrooms. They pass their torpor in closet-sized alcoves. In large families of 12 parents and upwards of 20 pups, there is a separate quiet room or hall with torpor alcoves lining the walls. the entrances aren't directly accessible from the ground, they're on a narrow mezzanine or simply float off the floor and are accessed by climbing or leaping. More modest homes simply have the alcoves lining a hallway. Others may have the alcoves in a larger common room which may have attached bathrooms and showers. Because yinrih are both shorter than humans and excellent climbers, this pattern of public space below and more private space above is seen throughout the home, even in what humans would call a one story house.

Xenoergonomics: Spacer's Canteen

Image

Sticking with the spacers, here's my solution for monkey foxes drinking in zero gravity.

Humans can use straws because we can form an airtight seal with our lips and rarefy the air in our oral cavity in order to produce suction.
Yinrih can't form a seal with their mouth, so straws are out. My solution is to have a piston actuated by a screw, similar to how some fountain pens refill ink. You turn the screw, pushing the piston into the chamber, exerting pressure on the liquid within. To drink, the person licks the ball baring at the end of the tube, and the pressure exerted by the piston causes water to flow out. These drawings are technically upside down. Being in microgravity means you'd probably hold the canteen upright with the tube at the top and the piston at the bottom.

There are two versions of the canteen: the one on the left is filled directly with water, while the other one contains a flexible bladder that contains the drink, allowing for easier cleaning.

Does any of this work? I have no idea. I only got 5 hours of sleep last night lol.

Xenoergonomics: Tail Gesture Ring

Image

In addition to keyers, the yinrih use tail gesture rings as computer input devices. The ring is worn around the tail, and the tail can execute 3-dimensional gestures like flicks, swipes, and twitches etc. Tail rings are favored when walking since it's easier than hobbling on 3 legs with a keyer in one paw. The input flexibility is limited, especially when it comes to text entry, but most people are just doom scrolling anyway.

I just realized that a MUCH simpler version of the spacer's canteen can be achieved by using a plain water bladder and bite valve. Since the yinrih have prehensile paws, they can just squeeze the bladder to get the positive pressure they need for the water to flow out.

HUD Specs Render

Image

Here's a render of a pair of HUD specs. They work similar to Google glass. They're designed to sit about half way down the muzzle. The angle of the lenses can be adjusted to meet the wearer's needs, and there are brightness and contrast dials on the side. As mentioned in the post about tail rings, HUD specs are intended for both portable and stationary use.