Clara Mancini’s colleagues used to laugh when she talked about her work. Mancini studies interaction design: finding ways to improve our experience of interactive technologies. Should there be buttons? How many, how large, what colour? As gadget designers well know, little things can make a big difference.

But Mancini had shifted her focus to a new group of users. “It was very hard at the beginning,” says Mancini. “People saw this as something not quite to be taken seriously, as something a little bit funny and cute.” It all centred on her chosen demographic: dogs.

Dogs might chase cars or howl at the TV, but when would they ever need to interact with technology? “I imagined seeing my dog sitting at a keyboard trying to type,” says Helen Sharp, a software engineer at the Open University, Carolina State University in Raleigh. He thinks technology can help rather than hinder. “We’ll be able to make them even better at their jobs,” he says.

But how do you design tech specifically for an animal? What are their needs? How will they best interact with man-made devices? As new research tackles these questions, we are learning how to help them help us better. What’s more, insights from working with animals may expand our horizons when it comes to building interfaces for ourselves.

We have long been strapping gadgets to animals. Zoologists routinely attach GPS trackers to beasts of the land, air and sea to monitor their movements. The US military has even stuck sensing devices to dolphins and sea lions trained to detect underwater mines. Crucially, however, none of this technology was designed with the animals’ experience in mind. “As we know from the field of interaction design, users need to be involved in the design process so researchers can know what they really want,” says Mancini. That’s usually when the jokes begin. “People would say things like, ‘How would you get informed consent from a tiger? If it doesn’t bite your head off, does that mean it approves?’”

But those turn out to be good questions. How do you design devices for a user that can’t tell you what it wants? Mancini’s team decided to focus their work on dogs, since they are already thoroughly integrated into our lives. Looking at the animals’ anatomy and behaviour is a good starting point.

Lights out

When Mancini began trials involving switching on the light, the dogs jumped time and time again for the switch, clumsily pawing at it but often failing to activate it. One expert trainer told her that she could count on dogs not being able to turn on the light even after several attempts. “Service dogs are struggling to do the tasks that are required of them,” says Mancini. “For them, operating a tiny, fiddly light switch is very difficult.”

Dogs cannot easily distinguish the colour red either, so red alarm buttons and lights don’t register. Dogs also categorise objects by size more so than shape, and prefer to use their noses for precision tasks such as hitting a button or turning off a switch.

Taking that into account, the team designed dog-friendly buttons in different sizes and in high-contrast blue and yellow, each activated with the touch of a nose or the slap of a paw. When Mancini presented dogs with them,
Imagine if you had to jump every time you turned on a light. That would stress you very quickly.”

In a second project, Mancini and graduate student Charlotte Robinson addressed the lack of any system for medical-assistance dogs to sound the alarm if their diabetic owner should suddenly collapse because their blood sugar has dropped abnormally low. The prototype alarm is a multicoloured rope that, when pulled with the mouth, sends a potentially lifesaving message to emergency services.

In July, Mancini and her colleagues exhibited their work at the Royal Society’s Summer Science Exhibition in London. A couple of wheelchair-using visitors who brought along their service dogs were delighted when their companions figured out how to work Mancini’s interfaces on the spot. Well-designed devices can help dogs communicate in other ways. Mancini is also working with cancer-detecting dogs, trained to use their sense of smell. Normally, the dogs sit or lie down to indicate the presence of cancer cells in a breath or urine sample, for example, and return to their owners if the sample is negative. However, if dogs are unsure whether what they are sniffing is malignant, they sometimes turn to their owners for help, possibly biasing the evaluation. Like humans, dogs vary in their interpretation of sounds. “It’s a music game,” says Wirman, who will soon return to Indonesia to test it. She needs to be quick, though. At the age of about 2½, orang-utans suddenly acquire an interest in percussion. “At that age, all they are interested in is exploring their sexuality,” she says. The orang-utans she observed were already outgrown her toy, so Wirman is switching to another game.

Designing electronic games for playful young orang-utans could be a way to enrich the lives of those in captivity

POKE TO PLAY

It’s not all work and no play in designing interfaces for animals. Hanna Wirman at the Hong Kong Polytechnic University has a background in video game design, but ditched her human games in favour of orang-utan games. In Indonesia, many young orang-utans are orphaned when their parents are killed during forest clearance for new oil-palm plantations, and may end up living in rescue centres. Wirman thinks games can enrich their lives. Initially, she spent many hours observing what the orang-utans do when left in small cages with hardly any outside stimulus. She noticed that poking one stick with another was a recurring game. Back in the lab, she created a plates with holes of various sizes, and sensor-containing sticks that could be poked into the holes, causing the plate to emit various sounds. “It’s a music game,” says Wirman, who will soon return to Indonesia to test it. She needs to be quick, though. At the age of about 2½, orang-utans suddenly acquire an interest in percussion. “At that age, all they are interested in is exploring their sexuality,” she says. The orang-utans she observed were already outgrown her toy, so Wirman is switching to another game.

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