Haofei Niu

Designer & Creative Technologist

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I design technology with the communities who will use it. My work combines ethnographic research with machine learning, IoT and material prototyping, and focuses on people and places that mainstream technology often overlooks.

01 TactiCall 2026
02 FluxID 2025
03 Bio Mosaic 2024

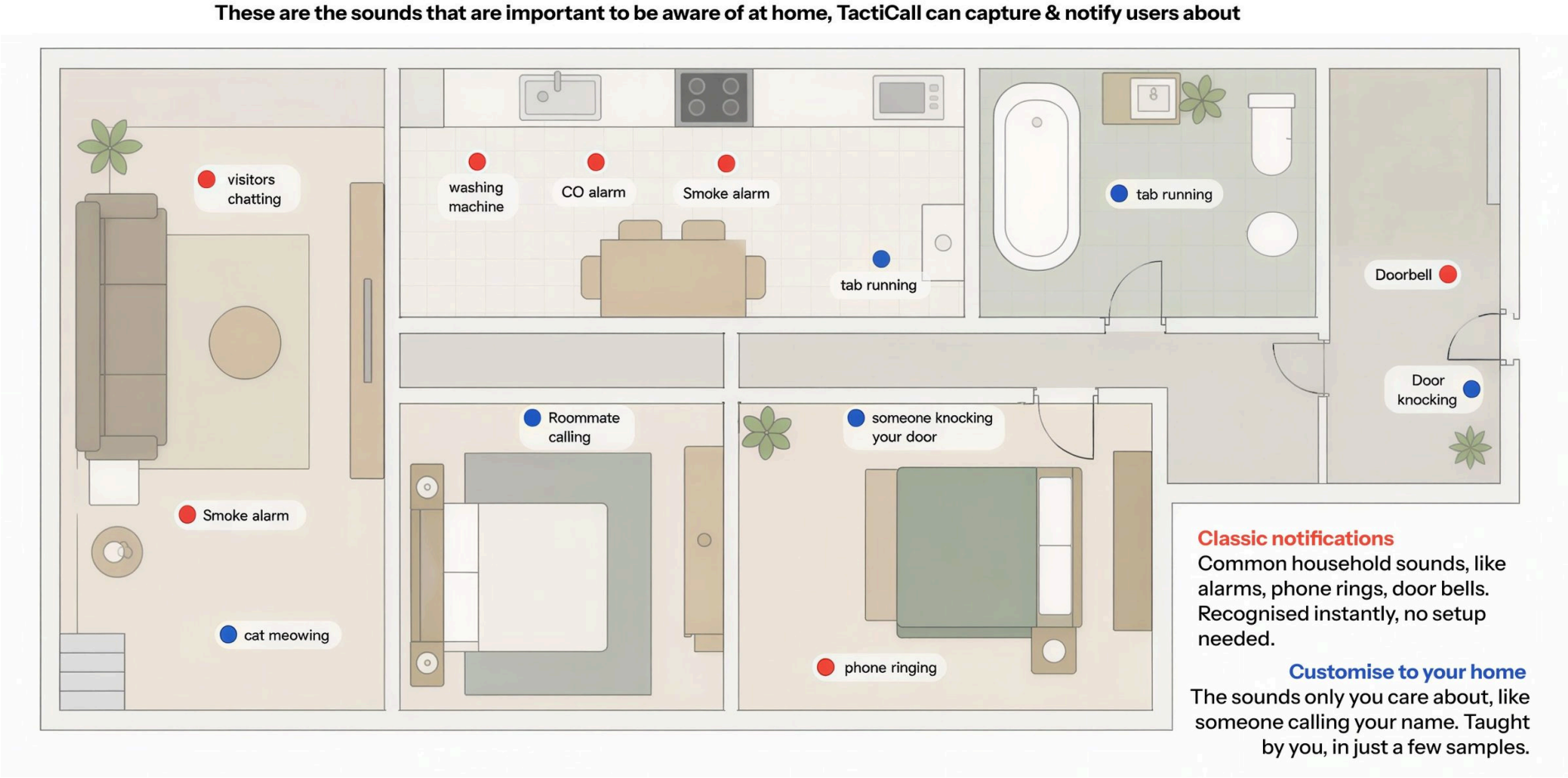
01

TactiCall

Founder
Product design
Machine learning
Haptics

Year 2026
SDGs 3 · 10

TactiCall helps deaf and hard-of-hearing (D/HH) people notice the sounds that matter at home, such as a smoke alarm, the doorbell or someone calling their name, when they are not wearing hearing aids or cochlear implants. A home hub recognises the sounds each person has chosen and sends a distinct vibration and icon to a small wearable, so alerts reach them in any room without rewiring the home. In-home interviews shaped the direction: D/HH adults described which sounds they need to hear and which they can ignore, and this varied from home to home, so every alert is set by the user. Older participants were more cautious with new devices, so the vibration patterns were kept simple and easy to learn. In pilot testing, the system recognised four household sounds with 100% accuracy, and participants identified the vibration patterns with 96.9% accuracy. A week-long home trial with a 7-person D/HH focus group is next.



What people need to hear

Mapped from in-home interviews. Classic notifications (red), such as alarms, doorbells and phone calls, are recognised straight away; customised sounds (blue), such as a roommate calling or a cat meowing, are taught by each user with a few recordings.



The system

A listening hub recognises the sounds each person has chosen, external microphones extend coverage to other rooms, and a smart wearable delivers each alert as a distinct vibration with an icon, with no rewiring of the home.



Listening hub

The hub mounts on a wall and is designed to blend into a living space, keeping the product calm and non-clinical.



External microphone

Placed by a doorway, an external microphone extends listening to another room, such as the kitchen.



An alert arrives

A fire alarm at night arrives as a vibration and an icon on the wrist, so it can be noticed without hearing devices.

02

FluxID

Urban Drainage Misconnection Detection

IoT
Citizen science
Environmental sensing

Year 2025
SDGs 6 · 11

FluxID helps communities find where household sewage is entering urban rivers through misconnected drains. Volunteer-led river surveys suit pollution that is scattered across a wide area, but fieldwork alongside citizen scientists and interviews with water-quality experts showed their limits: readings are imprecise, incidents are missed, and with few volunteers, checks happen at long intervals. FluxID pairs a low-cost IoT sensor with a live web dashboard, turning periodic volunteer checks into continuous, semi-automated monitoring. Readings appear on the dashboard in real time, so volunteers and partners can see when and where a problem occurs and focus their surveys there. The aim is to give community groups earlier and more consistent evidence of pollution, while keeping the reach and local knowledge that make citizen science work. The project was developed in collaboration with the NGO Outfall Safari and received the Sustainable Future Award at the CCI Winter Festival 2026.



The system

A low-cost sensor module clamps onto an existing outfall pipe, and a 3D-printed channel beneath the outlet directs any discharge through a flow sensor. Readings are sent to a live web dashboard that volunteers and partners can check at any time.



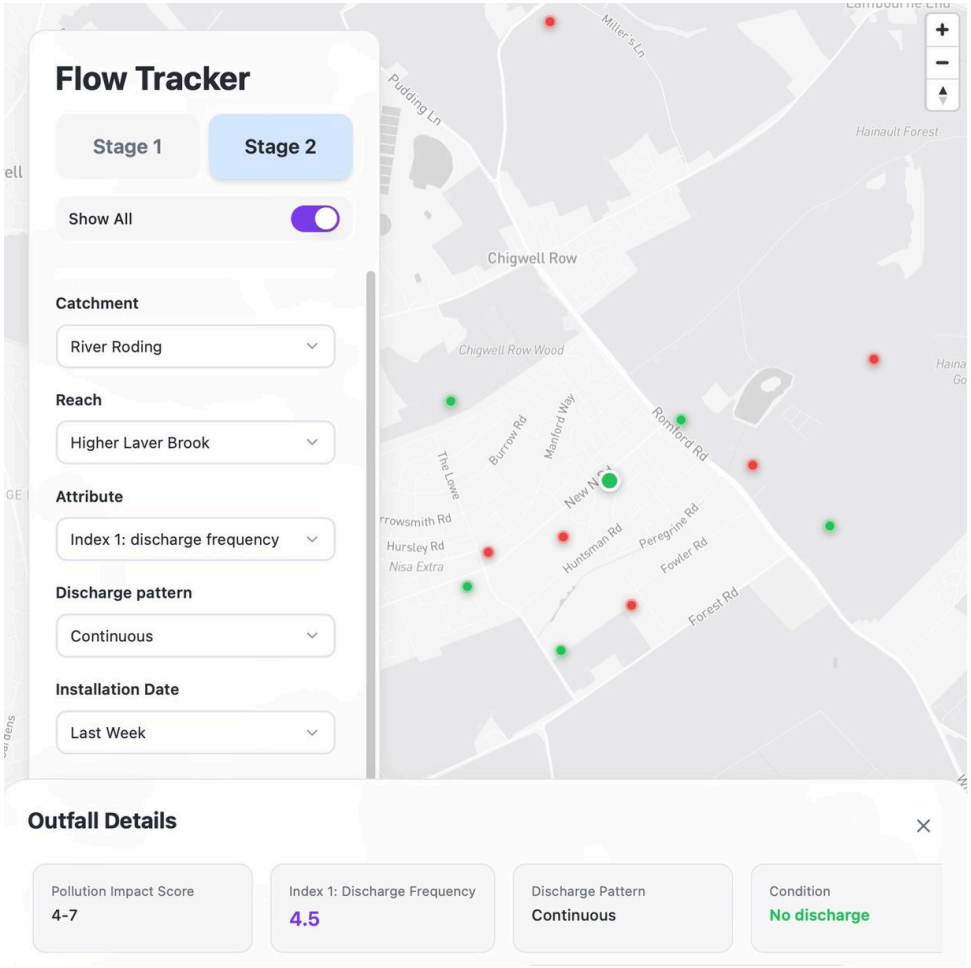
Mounting

The module is held by replaceable clamps rather than fixed into the pipe, so it can be fitted to an existing outfall and removed again once monitoring is complete.



In the field (visualisation)

Left in place between volunteer surveys, the sensor records when water flows and how much, turning occasional site visits into a continuous record.





Flow Tracker dashboard

Left: monitored outfalls on Higher Laver Brook in the River Roding catchment, filtered by discharge frequency and pattern. Right: the flow calendar flags dry-weather discharges; on 18 May 2025, flow peaked in the morning and evening, following household routines and suggesting misconnected domestic drains.

03

Bio Mosaic

Modular design
Natural materials
Urban rewilding

Year 2024
SDGs 11 · 15

Bio Mosaic is a modular kit that helps residents turn unused kerbside spaces into pocket forests. In Lambeth, community groups led by NGOs and residents are already greening unused land, and Bio Mosaic is designed to support and expand that work. Volunteering with a rewilding group and interviewing experts showed that most volunteers are retirees who take part for social contact and exercise, yet the work is heavy and carries a real risk of injury. Bio Mosaic keeps what volunteers value and reduces the strain. Made from timber, coconut shell and woven grass, the kit has four frame sizes that combine into different shapes and heights so a range of plants can thrive; attachable baffles make assembly quick, and built-in drainage makes upkeep easier. The project was selected for the UAL showcase collection Planetary People.



On the kerbside

Modules combined along a kerbside, turning a strip of unused space beside the road into a planted pocket forest that residents can build and look after themselves.



The kit

Timber frames in four sizes, with coconut-fibre and woven-grass panels that line each module. Attachable baffles keep assembly quick and adjustments simple.



One kit, many arrangements

The same modules combine into different shapes and heights, so a range of plants can grow side by side and each group can fit the kit to its own site.



Building together

Residents planting into Bio Mosaic modules. The kit keeps rewilding social and active while making the work lighter and safer.