

Beaver AI Lab: A National Living Lab for Fear-Transforming Social Robots

A strategic proposal to position the University as Canada's hub for applied, human-centred AI, mental health, and aging technology.

2026–2030 Strategic Vision



Executive Summary: Converting Anxiety into Agency



The National Gap

Canada leads in AI theory (Pan-Canadian Strategy) and aging networks (AGE-WELL), yet a critical gap exists in scalable, compassionate support for mental health and aging populations. The 'Last Mile' of care is missing.



The Beaver AI Solution

A flagship 'Living Lab' centered on a culturally branded Canadian social robot. Combining robotics, CBT, and mindfulness, the Lab transforms fear into curiosity through embodied interaction.



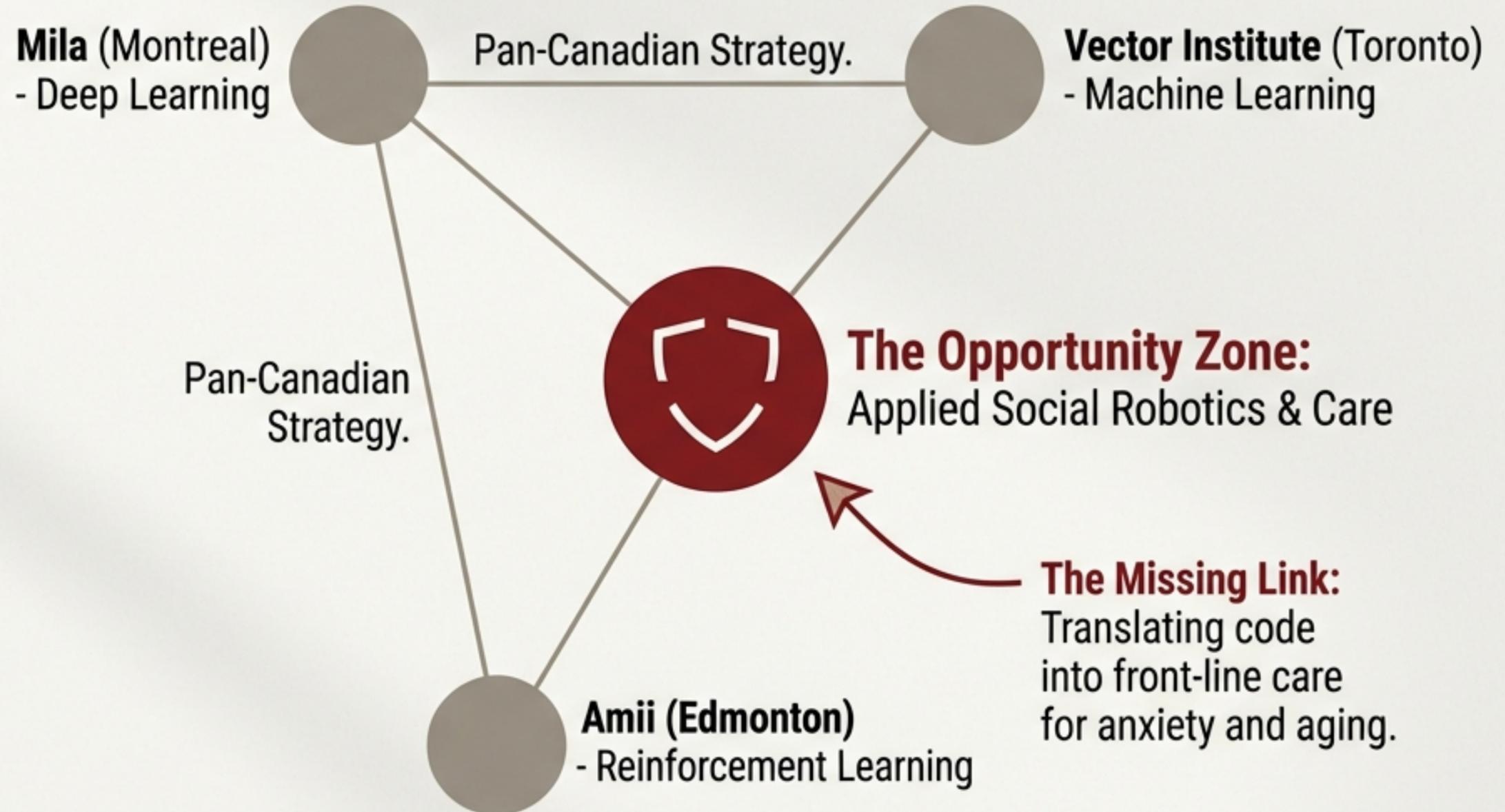
Institutional Value

Positions the University as the national leader in applied human-centred AI. Unlocks NSERC Alliance & SSHRC funding, delivers visible student wellness support, and attracts interdisciplinary PhD talent.

The Landscape: Canada is an AI Superpower, but the 'Last Mile' is Missing

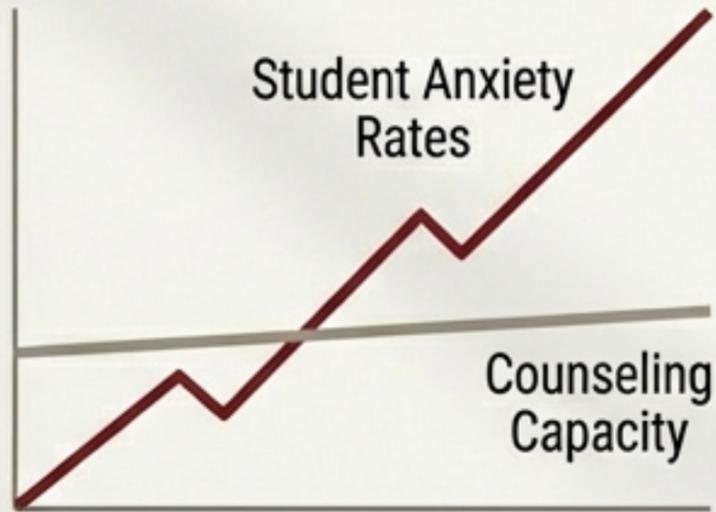
Canada invests heavily in fundamental research via CIFAR AI Chairs.

However, the ecosystem lacks an "**Applied Human-Centred**" player to address rising public anxiety regarding tech change and demographics.



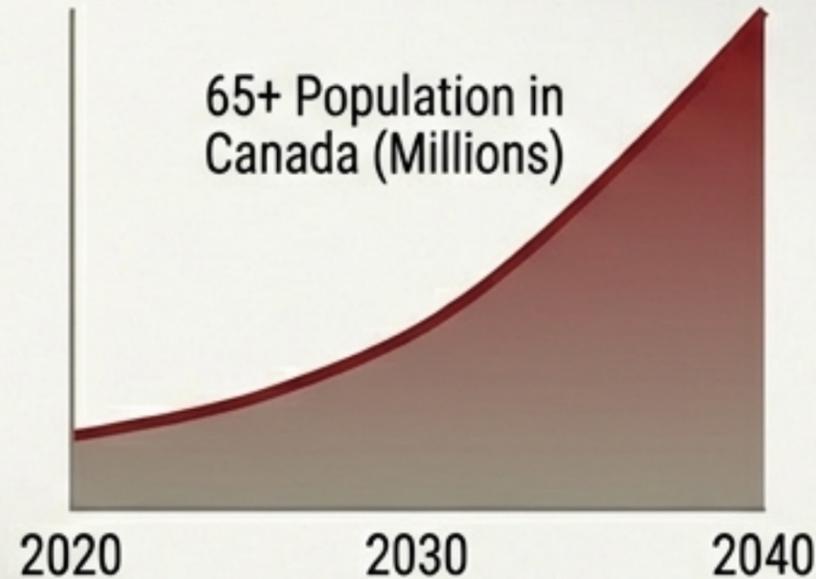
The Urgent Challenge: A Crisis of Anxiety and Demographics

Mental Health Gap



Rising student anxiety demands scalable interventions beyond traditional hours. Text-only chatbots lack the "presence" required for deep comfort.

The Silver Tsunami



The "Silver Economy" requires technologies that support independence. Current solutions are often disjointed or difficult to use.

Tech Fear & Displacement



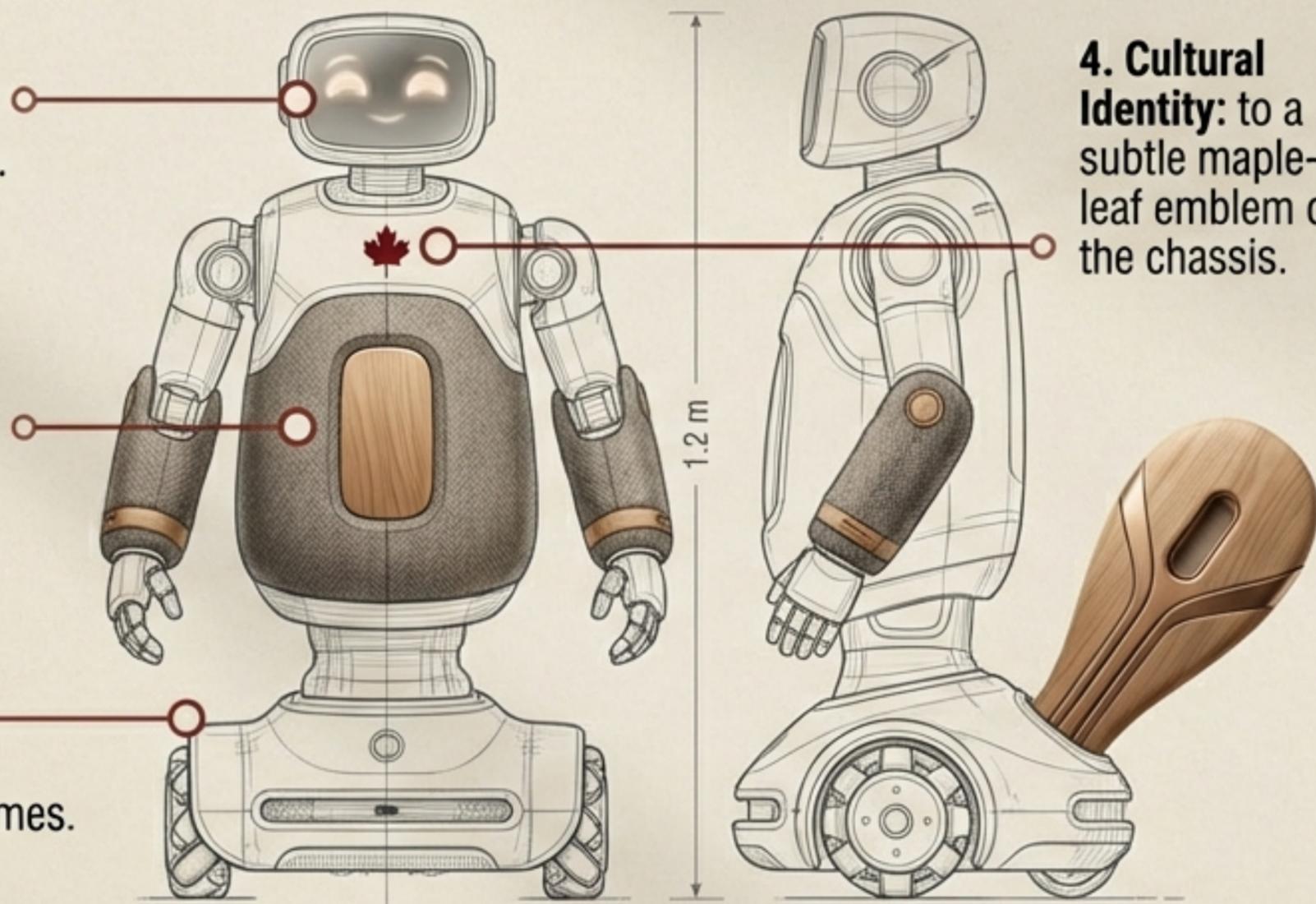
Public apprehension about AI is high. We need "Responsible AI" that teaches and assists rather than threatens.

Introducing the Beaver AI: A Companion for the Canadian Context

1. Expressive Gaze:
Non-threatening,
affect-aware LCD eyes.

2. Tactile Warmth:
Soft-touch fabric and
wood accents for
approachability.

3. Stabilized Base:
Omni-directional
movement for care homes.



4. Cultural Identity: to a
subtle maple-
leaf emblem on
the chassis.

Not a toy, but a sophisticated care platform. Unlike generic humanoids (Pepper), the Beaver AI is culturally grounded to reduce fear of technology and combat loneliness through evidence-based dialogue.

The Hypothesis of Cultural Resonance

Generic Robot: Alienating, High-Tech, Low Trust.

Generic designs can trigger “Uncanny Valley” responses in seniors and anxious users.



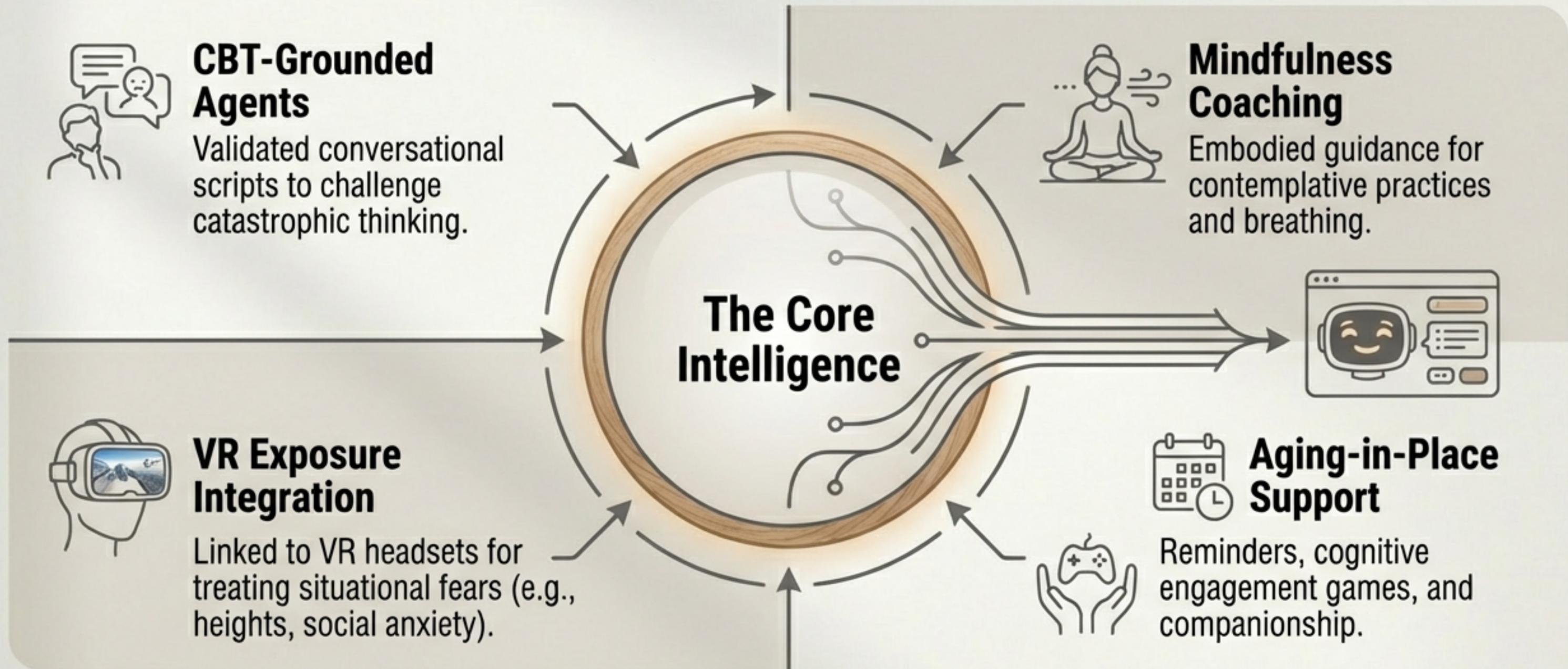
Beaver AI: Familiar, Grounded, High Trust.



National symbolism lowers the barrier to entry. The beaver connects to stories of land and nature, serving as a bridge for AI literacy.

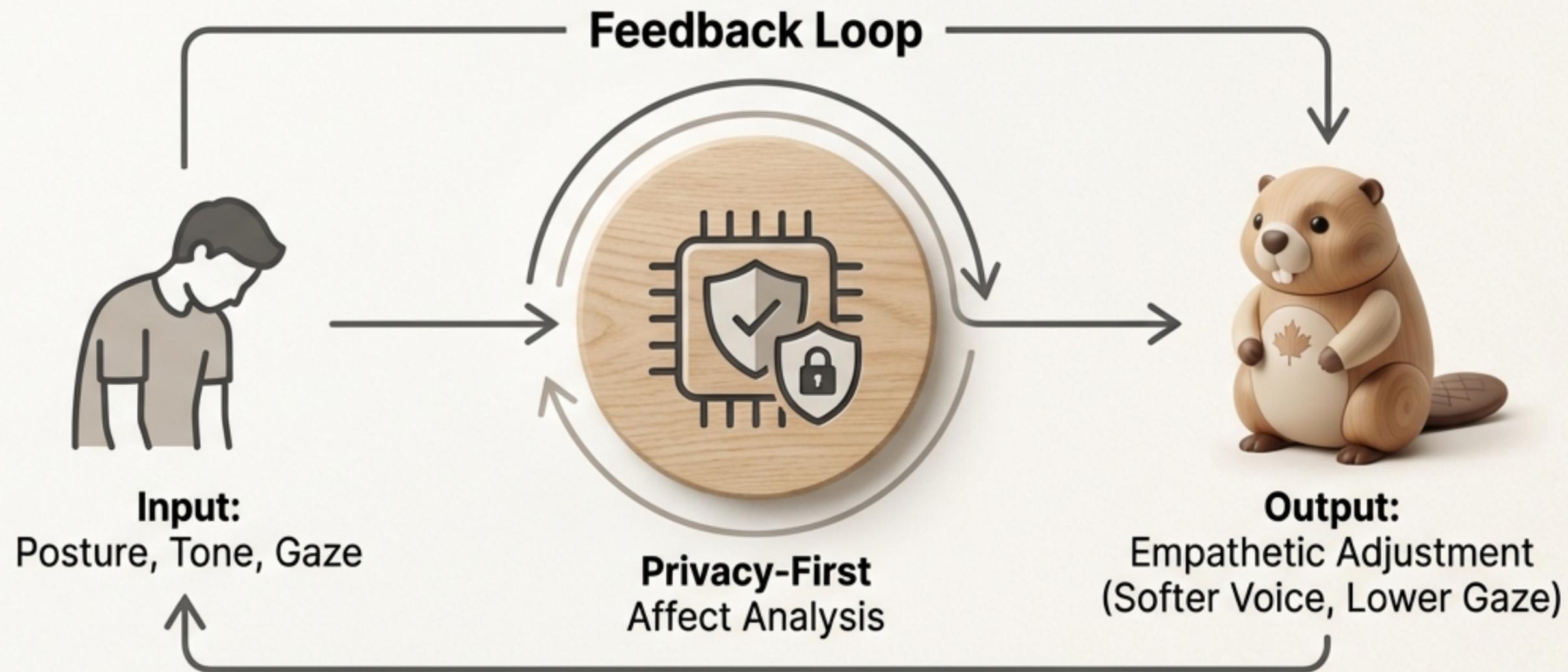
Core Research Question: How does cultural resonance affect technology acceptance? Can a familiar national icon transform fear into curiosity?

Multimodal Intelligence: The Convergence of Four Modalities



Research Theme 1: Human–Robot Interaction (HRI) & Affect-Aware AI

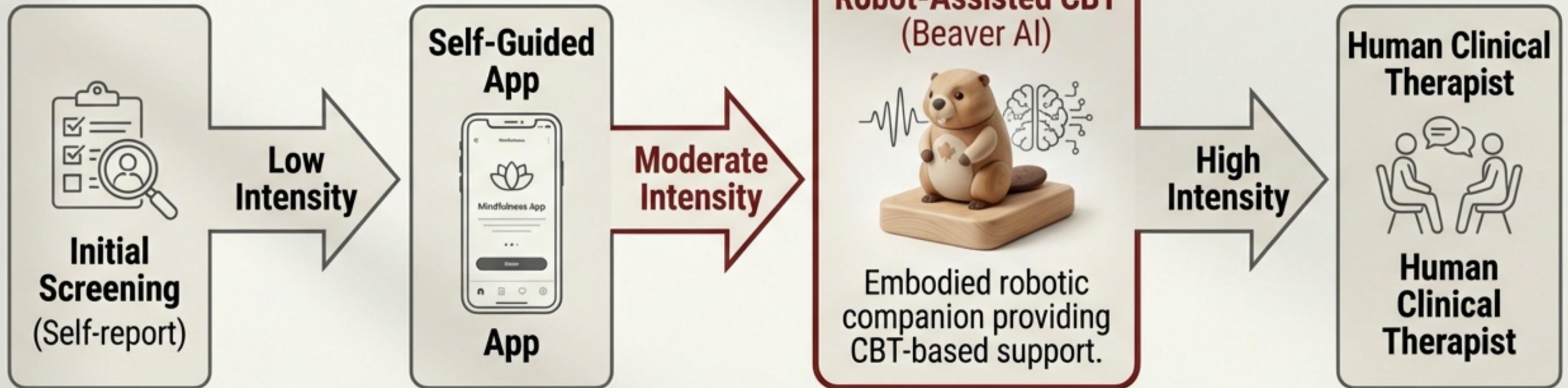
Focus: Designing multi-modal affect recognition optimized for *safety* and *transparency*. We investigate how robot embodiment—size, movement, and cuteness—modulates anxiety and the willingness to disclose sensitive information. **Goal:** Defining new standards for privacy-first social robotics.



Core Research Question: How does affect-aware design influence user trust and privacy perception in educational and therapeutic contexts?

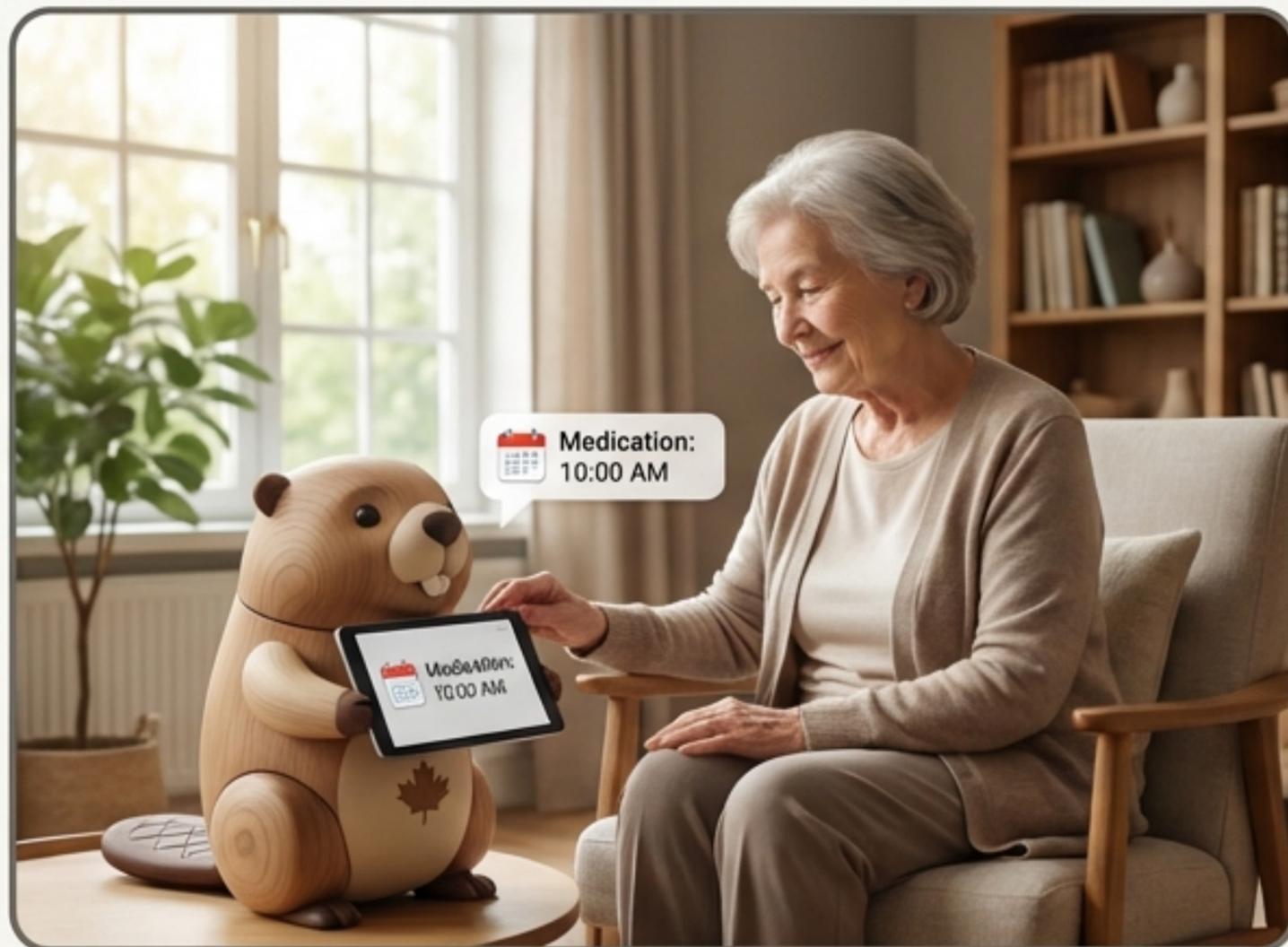
Research Theme 2: Digital Mental Health & Clinical Science

Stepped-Care Protocol



We are conducting Randomized Control Trials (RCTs) to compare Robot-Supported interventions vs. App-Only and Standard Psychoeducation. This research integrates the robot into existing wellness structures to catch students before they reach crisis levels.

Research Theme 3: Technology for Aging & Inclusive Tourism



Aging-in-Place

Deployment in long-term care to reduce loneliness and support caregivers (Aligned with AGE-WELL).



Inclusive Tourism

Co-designing with disability advocates to place robots in tourism hubs, reducing travel anxiety and increasing accessibility.

Research Theme 4: Ethics, Governance & AI Literacy

Transparency Dialogue



I notice you seem anxious. My sensors detected a change in your voice pitch.

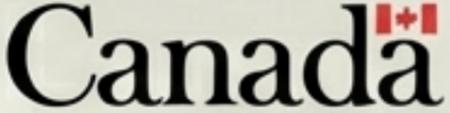
Where does that data go?



My listening mode is local-only. No audio is sent to the cloud. I delete this data immediately after our conversation.

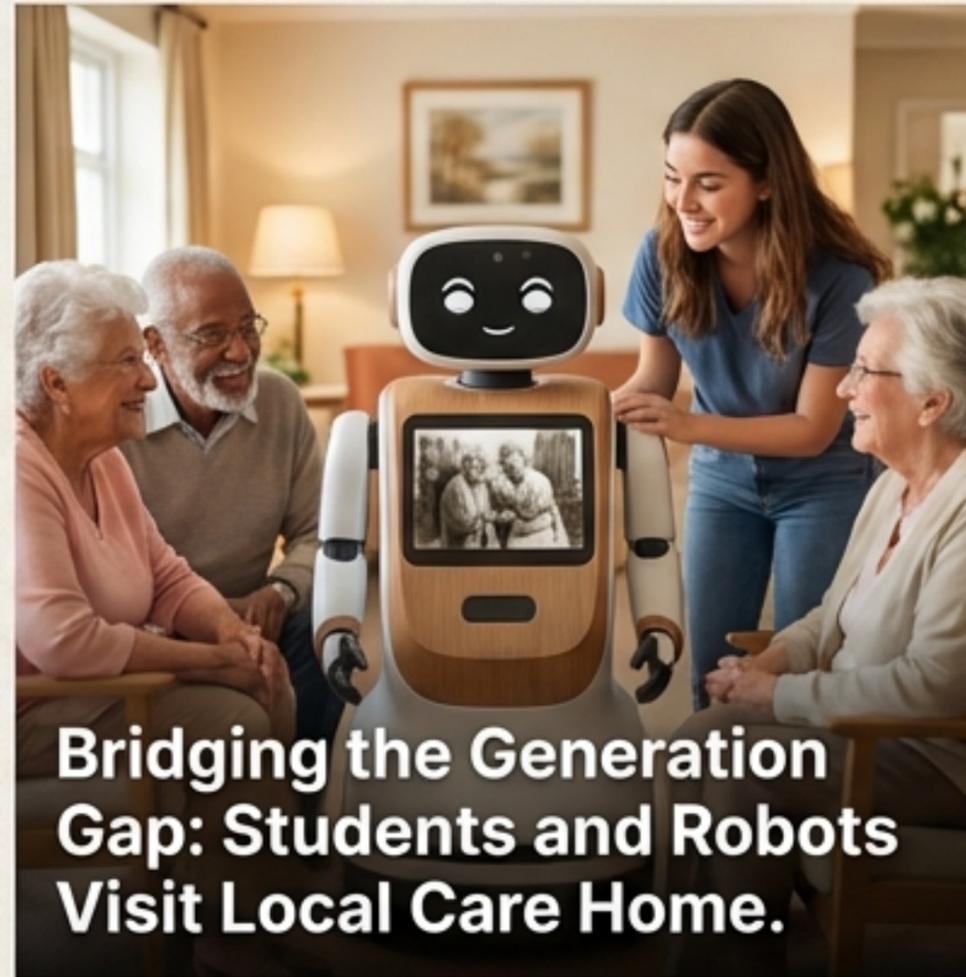
We use the robot to explain *itself*. Through ‘transparency dialogues,’ we empirically test how understanding the algorithm impacts user trust and moral agency. This supports Canada’s leadership in responsible AI implementation.

Strategic Alignment: Unlocking Federal & Provincial Funding

Research Themes		Funding Bodies	
Technical Development (HRI)	→	 NSERC Alliance	 NSERC CREATE
Psychological Impact	→	 Social Sciences and Humanities Research Council	 Canadian Institutes of Health Research
Aging & Care	→	 AGE-WELL	 CIFAR AI Chairs
Tourism & Society	→	 Provincial Tourism Ministries	Various Provincial & Territorial Ministries

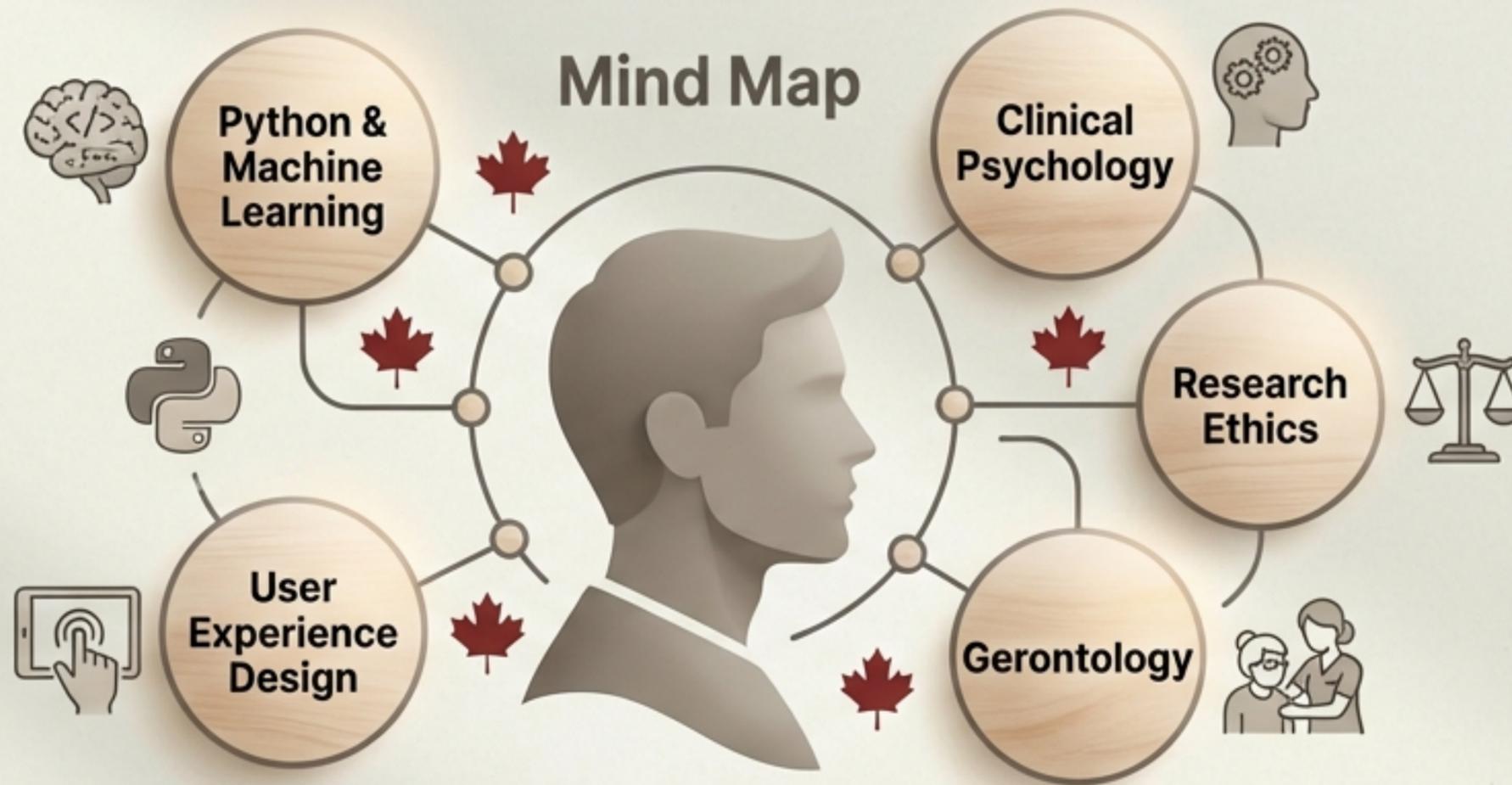
This lab does not compete with existing AI institutes; it *applies* their science to unlock new funding pots. It is a direct fit for AGE-WELL National Innovation Hubs.

The Living Lab: Immediate Campus & Community Impact



Visible robots on campus provide immediate non-judgmental support during exam periods, **generating** positive PR and tangible community engagement.

A Magnet for Interdisciplinary Talent



Recruitment Strategy: We attract top PhD and MSc students who want to work at the intersection of AI, Psychology, and Society.

Value Proposition: Experiential learning. Students don't just code in a basement; they co-design and deploy in real-world settings (care homes, tourism sites). We are training the next generation of 'Human-Centred AI' leaders.

Implementation Roadmap: From Pilot to National Hub

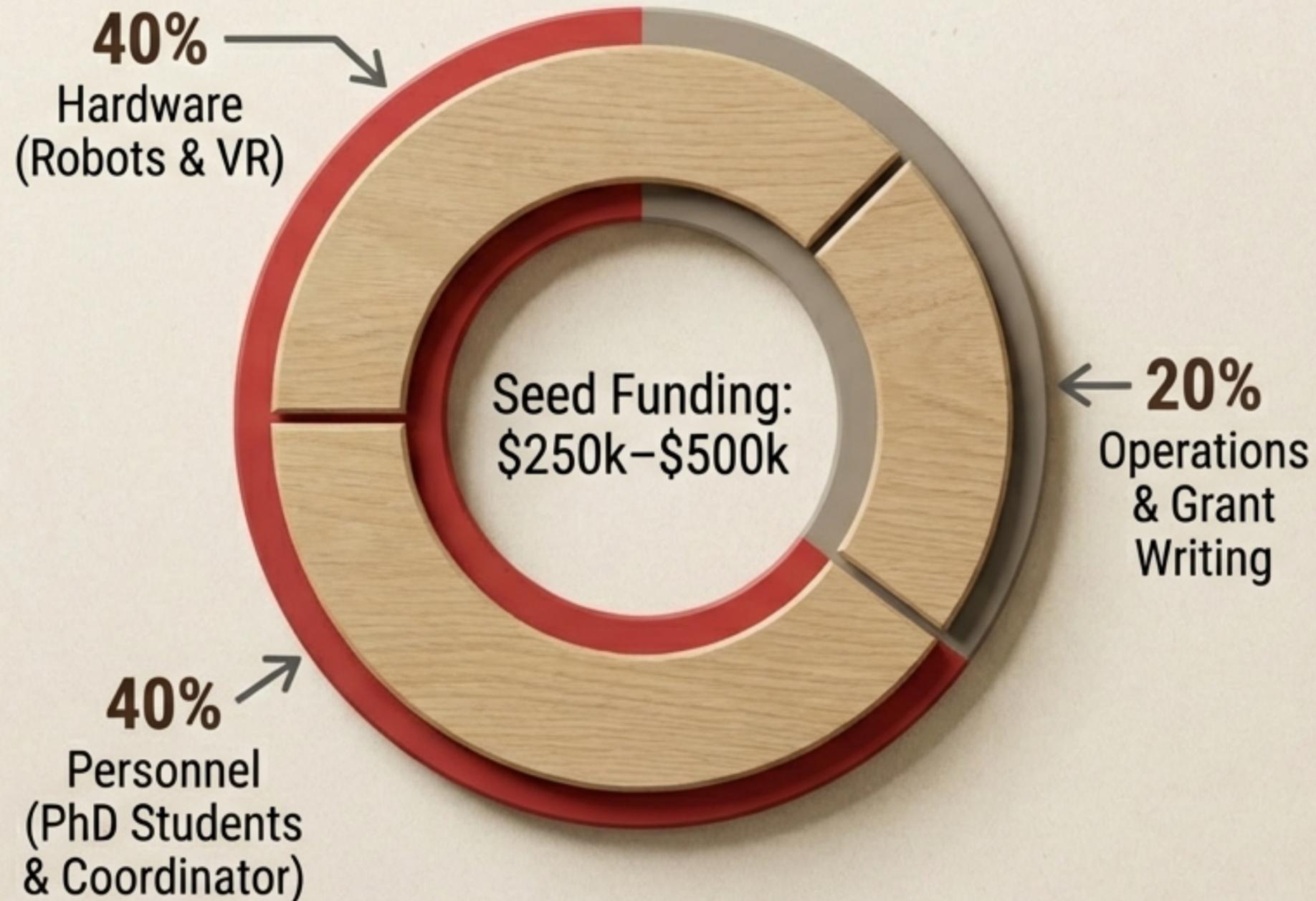


Acquire 2-3 robot platforms.
Establish steering group.
Launch campus wellness pilot.

Submit NSERC Alliance &
AGE-WELL applications.
Expand to local care home partner.

Full-scale deployment.
Designation as National Innovation Hub.
Commercial spin-offs.

Resource Requirements & Institutional Support



The Ask

- 🍁 1. Endorsement: Strategic designation under the VP Research.
- 🍁 2. Seed Funding: \$250k-\$500k over two years.
- 🍁 3. Space: Allocation for the 'Living Lab' central hub.



Transforming Fear into Agency

Let us build the 'Warmth of Intelligence' right here.
A leader in compassionate AI.

The Beaver AI Lab