
FLUTTER FLY
6195474
KEYS? FOUND
CRITICAL THINKING?
404!

Preface:

Saying "Hi" to Flutter Fly

Throughout human history, technological advancement has served as a means to extend human capability — tools, machines, and systems have augmented physical strength, improved communication, and enabled cognitive expansion. Today, as Artificial Intelligence (AI) technologies evolve into **embodied**, interactive agents, we are witnessing a new era in which intelligence is no longer passive or abstract but situated within the physical world and capable of acting within it. In this context, the development of Flutter Fly, a personal assistant robot, represents a significant leap forward in the integration of AI into everyday life. From this point, I take the philosopher's point of view and use human psychology and academic evidence to support my arguments. [1]

Every morning, I pat my pockets only to realize I've misplaced my keys – again. Instead of retracing my steps, I now simply ask my personal assistant robot for help. With unfailing efficiency, it locates the keys under a pile of mail. This little routine saves me time and frustration. Figures 1, 2 in section 5 brings these ideas to the real world. Yet, as I lean on my robot helper for such everyday tasks and has practical benefits including increased **convenience** (see Figures 3, 4), improved efficiency, and enhanced daily functioning, I find myself pondering an unsettling question: *What am I trading away for this convenience?* In the silent moments after the robot chirps the key's location, I sense a subtle shift in my **dependence, memory, critical thinking, personal accountability, and cognitive autonomy**. Additionally, I see broader societal implications such as privacy, human agency, and the nature of human-machine relationships. As a roboticist and a user of this technology, I feel compelled to reflect on the ethical and existential dimensions of living with a robot that tracks and finds my lost belongings.

This essay is a personal exploration of that dependency—wrestling with questions that explore the ethical dimensions and socio-cognitive impacts of embodied AI, using Flutter Fly as a representative case. It examines the potential consequences of over-reliance on assistive robots, both at the individual and societal levels, and offers engineering guidelines to promote responsible and human-centered AI design. Ultimately, I am searching for an answer to the course's overarching question: *"How to live well with robots?"*

[1] Ideas are generated solely by the author, academic papers, and websites in the reference section. I acknowledge ChatGPT that is utilized for rephrasing sentences without grammatical errors

Reflections on a Life with my Personal Assistant Robot
A Philosophical Exploration
Robots and Society (RO47008)

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1 Potential ethical issues when living with my robot

At first, having a robot to track my belongings felt like gaining a superpower. No longer did I have to memorize where I put my wallet or spend anxious minutes searching under couch cushions? In cognitive science terms, I was engaging in **cognitive offloading**—offloading mental tasks (memory and attention) onto an external aid. I feel this may create potential issues of being **over-reliant** on it. Studies on AI tools and memory[5] find that excessive reliance on external aids may cause a **decline in our internal abilities** – for instance, weakening our memory retention and critical thinking skills as depicted in Figure 6. In my case, the robot serves as an external memory; it is effectively an adjunct to my mind that remembers locations so I don't have to. This can be compared to the **Google effect**[13] in which people stop memorizing information because they know it's easily accessible online; instead they only remember how to retrieve it. It can be sometimes referred to as **Digital Dementia**[10].Even though I feel less stressed and more organized, I also wonder, *"what happens to my own memory and mental sharpness as I rely on my robot every day?"* A study [5] on young individuals shows a negative correlation between frequent use of AI tools and critical thinking ability, with heavy users of AI assistants scoring lower in critical thinking than those who use such tools less. Consequently, this over-reliance will also lead to **complacency** – a form of **automation bias** [12] where I may not double-check my robot's suggestions or actively engage in tasks. I could relate this behaviour psychologically, from one of my favorite books – *Thinking Fast and Slow* by Daniel Kahneman [8]. It tells system II of our brain which is responsible for this evaluation (double checking the automation) needs effortful thinking. Generally, humans tend to not use it when they are nonchalant and trust the robot hundred percent. This is also a living phenomenon backed up by drivers who become overly dependent on GPS navigation and fail to develop spatial memory of their environment [3].

Research on AI assistance suggests a double-edged sword. Another personal impact could be I may have **diminished accountability** for my responsibilities. If my robot is always there to find my lost item, I may feel less responsible for being organized or attentive. Psychologists studying human-robot teams note a **shift in blame and responsibility** when robots enter the picture if they believe it is autonomous or smart enough to be in charge [16]. This reduced sense of accountability can subtly encourage a hands-off approach to my organization and memory. Over time, that could erode my habit of personal accountability and self-reliance in everyday tasks.

2 Potential ethics issues in the society

The effects of my robot assistant extend beyond my own mind; they reach into the social fabric of my home. On a social level, introducing an object-tracking assistant robot into daily life raises important **privacy and trust issues**. By outsourcing attention and memory to a machine, I introduce a new agent into the intimate sphere of daily life. My home is no longer a purely human space - it's shared with a vigilant electronic observer. Researchers in human-robot interaction point out that robots in domestic spaces pose physical privacy concerns because of their mobility – a robot could potentially enter private areas of the home (bedrooms, bathrooms) to help [9]. I personally feel it comes with a cost of how much information you provide to get more personalized recommendations and a better search. This tradeoff has to be made considering a very important assumption that all my information is secure.

In my case, the assistant robot knows my daily routine and where I go; where I keep things; if such data were misused, it would be a profound violation of privacy. These concerns are not merely hypothetical. We can draw parallels with existing Bluetooth **tracking tags** like Apple's AirTag or Samsung SmartTag. While designed to help find lost belongings, they have sparked widespread apprehension over malicious misuse. There are documented cases of these tags being used for stalking or tracking people without consent, leading to serious privacy violations [15]. Integrating a robot into this space forces me to ask: *"How much surveillance am I willing to accept in exchange for convenience?" And "how do I ensure that this technology respects the intersubjective ethics of living with others?"*

There is also a broader **social-cultural impact** to consider: Living with a robot also subtly shifts social dynamics. I've caught myself asking my roommate fewer questions like *"Have you seen my keys?"* because I ask the robot instead. That's a minor interaction lost, but multiply such effects and we might see a reduction in the small moments of cooperation or conversation that bind people together [7]. Thus, there are a lot of potential ethical concerns to be accounted, especially thinking the scale of impact it could create.

3 Evaluation of the problems

Evaluating potential risks at various levels, from smart assistants that manage our schedules to robots that can care for the elderly, the allure is clear—we can do things faster, with less effort, and perhaps with more precision. This trend, however, comes with a philosophical anxiety that I feel in my own small way: *Are we making ourselves obsolete?* When my robot does the work of remembering and finding objects, I sometimes **feel like a bystander** in my own life, spectating as it performs what I used to do. Extrapolate this to the workforce or society at large: If robots handle more responsibilities (finding things, delivering items, driving cars, even providing care), *what is left for humans to do?* One might argue that this frees us to pursue higher-level goals—creativity, relationships, and personal growth. Indeed, there is a hopeful vision in which technology shoulders the dull work, while humans flourish in domains machines, can't touch. But there is also a dystopian specter of human obsolescence, where people lose not just jobs but a sense of purpose and competence. Philosophers and ethicists actively debate this tension **between technological efficiency and human dignity** [2].

Economically, the integration of personal assistant robots poses questions of **equity** and access as well. Will these technologies be available to all, or only to those who can afford them, potentially widening social gaps? If only some people have the luxury to offload cognitive burdens, will we see a divergence in cognitive capacities over time? While these questions go beyond my personal experience, they linger in the background of any discussion on living well with robots. The moral

responsibility we have, as a society, is to deploy robots in ways that **benefit humanity as a whole**, and to mitigate the risks of making any group of people feel left behind or devalued. Efficiency gains from robots should ideally translate into better quality of life for humans, not a mere increase in corporate profits or convenience for the few. This perspective ties into the next topic: how we assign responsibility and ensure ethical integration of robots into our lives and communities?

4 Responsible development for engineering the robot

To live well with personal assistant robots and mitigate the concerns above, responsible design and deployment practices are essential. In this context, I would like to have some design recommendations that incorporate ethical and human-centered principles to ensure such robots enhance human life without undermining it:

1. **Design for Augmentation, Not Replacement:** Robots should be designed to augment human capabilities rather than completely replace them. For instance, a robot assisting with finding objects could initially provide clues or ask guiding questions to encourage the user's own cognitive engagement. This way, the user's memory and problem-solving skills are exercised, not erased. The aim is a partnership that augments human capability while preserving agency. This can be seen in studies of the principle of reversibility [14]. Preserving a space for human effort is essential for dignity and growth.

2. **Embed Privacy and Consent Safeguards:** Given the intimate data these robots handle, privacy must be a core design value, not an afterthought. The robot should minimize data collection to only what is necessary to fulfill its function of finding objects. Any data it does collect (locations of items, timestamps, images from inside the home) should be stored securely and locally if possible, with transparent settings that the user controls [4]. Informed consent is crucial so that users and other household members should know what data the robot collects and when (for example, a light could indicate when it's recording or uploading data [1]).

3. **Prioritize Transparency and Explainability:** Instead of a black-box that mysteriously outputs answers, the robot could explain how it knows where an item is ("I saw you put the keys on the kitchen counter at 7 PM"). This not only builds trust but also allows the user to catch any errors or misperceptions the robot might have. This is evident in recent LLMs which use chain of thinking-based reasoning [17] which gives transparency and aligns with the ethical commitment to accountability.

4. **Promote Gradual Assistance:** Robots should offer assistance in a tiered manner, allowing users to attempt tasks independently first and then gradually increasing the level of robotic support as needed. As per the challenge point framework [6], learning is optimized when the learner is actively involved in problem-solving during the process of finding solutions. Thus, a correct amount of guidance and challenge should be provided by the robot in-order for the user to keep his/her critical thinking ability. Figure

By incorporating these kinds of recommendations as depicted in 7, designers can create personal assistant robots that truly preserve human flourishing and autonomy. If done right, the robot that finds your keys can be more than a convenience—it can be part of a **supportive ecosystem** that lets you focus on what truly matters in life, without diminishing your essential human capacities.

5 Conclusion: Recipe to "How to live well with robots?"

After this journey—through daily interactions, quiet observations, and moments of pause—I return to the essential question: "How do we live well with our robots?" Not just use them, or accept them, but truly live alongside them in a way that preserves the depth and dignity of being human. For me, living well with my assistant robot is an **act of mindful balance**. It's about embracing the gifts of technology—convenience, efficiency, even a dash of companionship—while vigilantly guarding the qualities that make life meaningful—memory, agency, privacy, human connection, and moral responsibility. Every time I am with my robot, it prompts me (sometimes subconsciously) to **consider what I truly value**. Do I value remembering my own life events? Yes, so I won't delegate all memory tasks away. Do I value my privacy? Absolutely, so I'll check that the robot isn't streaming my home life to the cloud. Living well with my robots means being an **active participant** in our relationship with them, not a passive consumer of its services.

But living well with robots extends beyond the personal. These devices are not isolated novelties; they are part of a collective transformation. So I believe living well also requires engagement with the wider ethical and social landscape. Ethically I believe that we all bear some responsibility for shaping the norms of **human-robot coexistence**. Living well requires that we join the broader conversation, helping to build a culture that neither idolizes nor fears robots, but approaches them with thoughtful care.

In summary, my philosophically grounded answer to living well with robots is this: **Treat the robot as a tool that is woven into the tapestry of your life, but never let it replace the threads of your humanity**. Use it to empower yourself, not to surrender your capacities. Welcome it into your home, but uphold the sanctity of your private and social spaces. Trust it to do its job, but hold onto responsibility for the outcomes. And, this concludes with optimistic thoughts on living with my robot.

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Supplementary Materials

Figure 1: Bringing the robot – Flutter Fly in real-world [11]

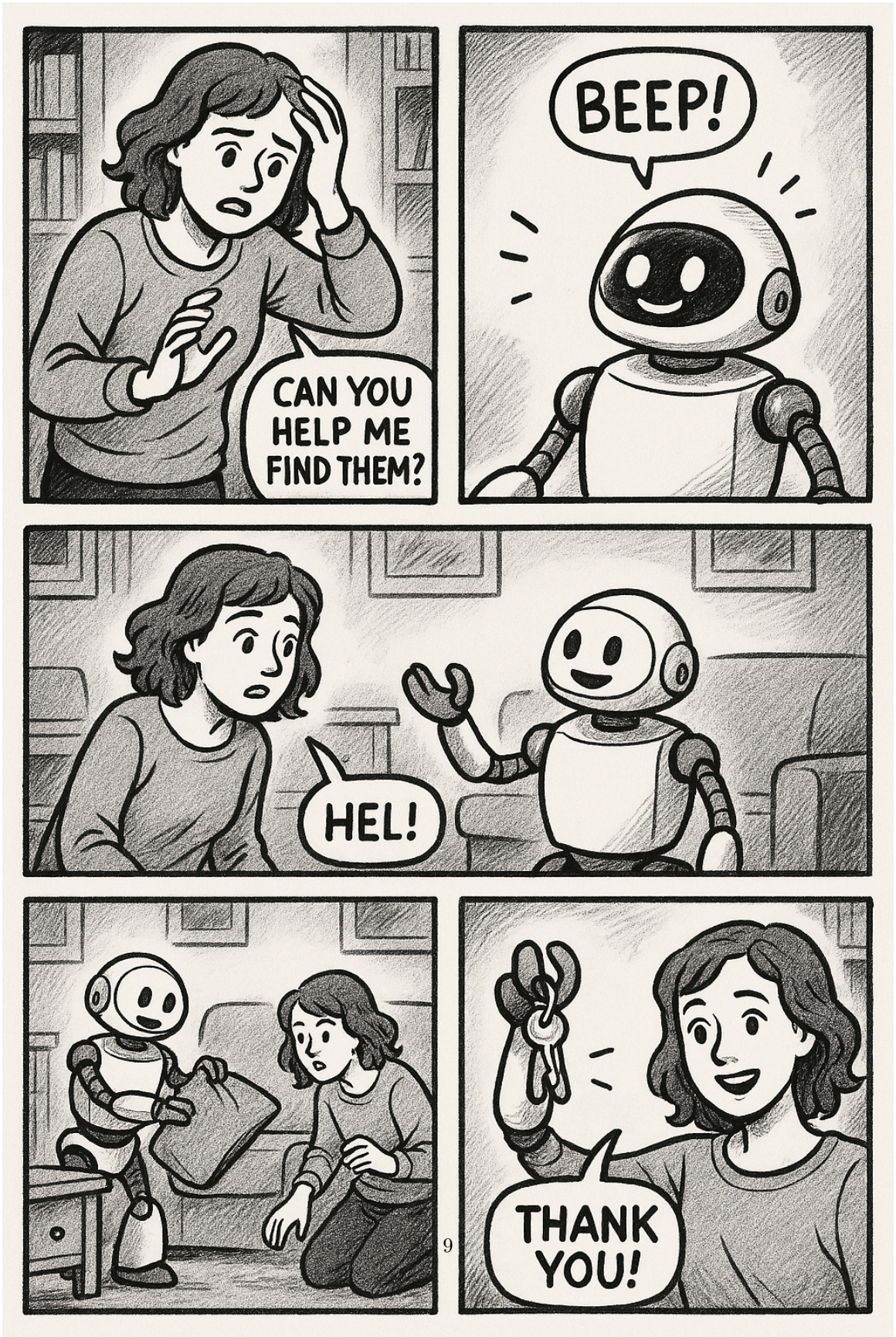

Figure 2: A comic story depicting robot's utility [11]

Figure 3: This figure depicts when I was accompanied by my robot in a lecture and tried to clear my doubts about difficult concepts

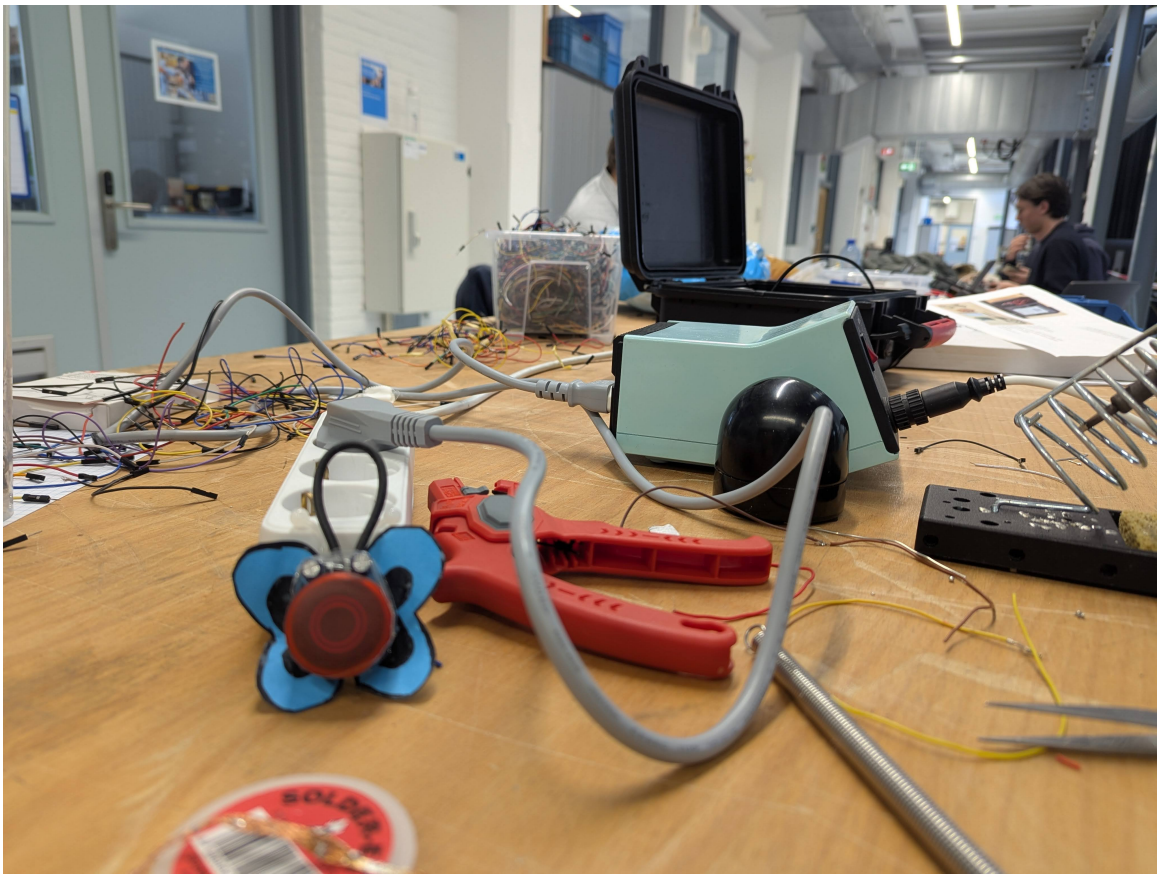

Figure 4: A real-life scenario when I ask my robot to find tools in a workbench

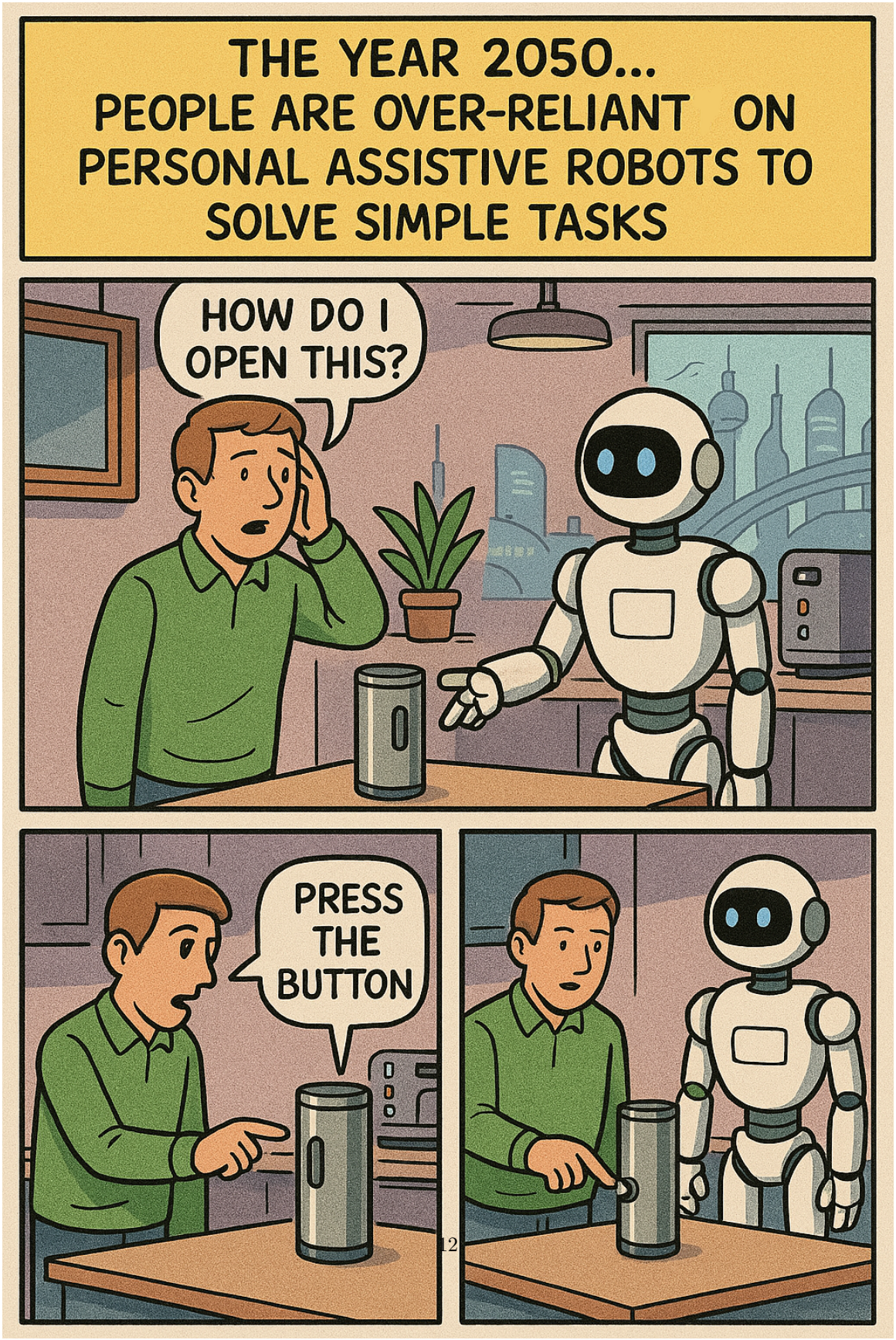

Figure 5: A comic story depicting over-reliance for simple tasks of opening lid of a kettle; without actually putting efforts into it before[11]

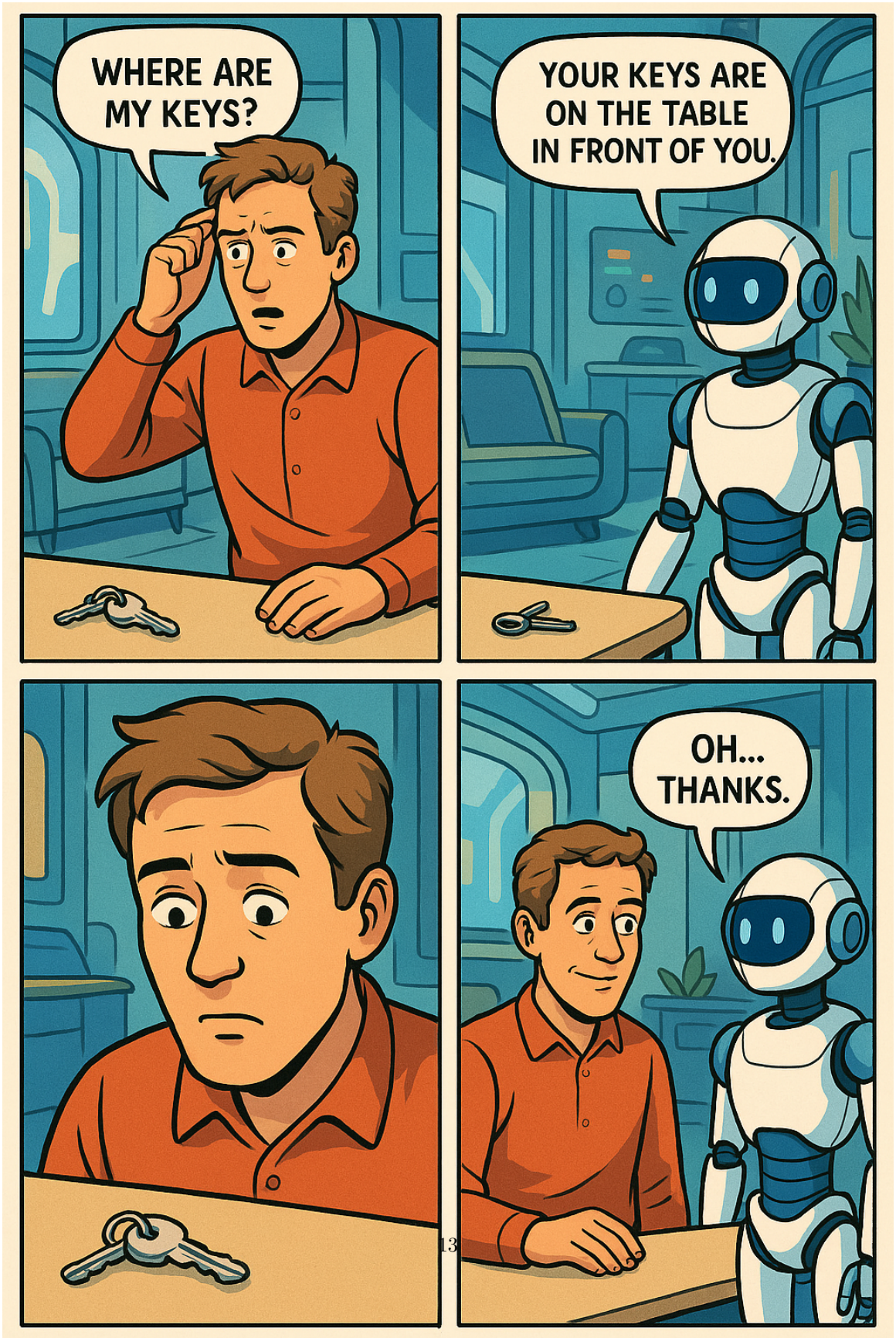

Figure 6: A comic story depicting the decline of critical thinking ability for even tasks of finding the key in his vicinity [11]

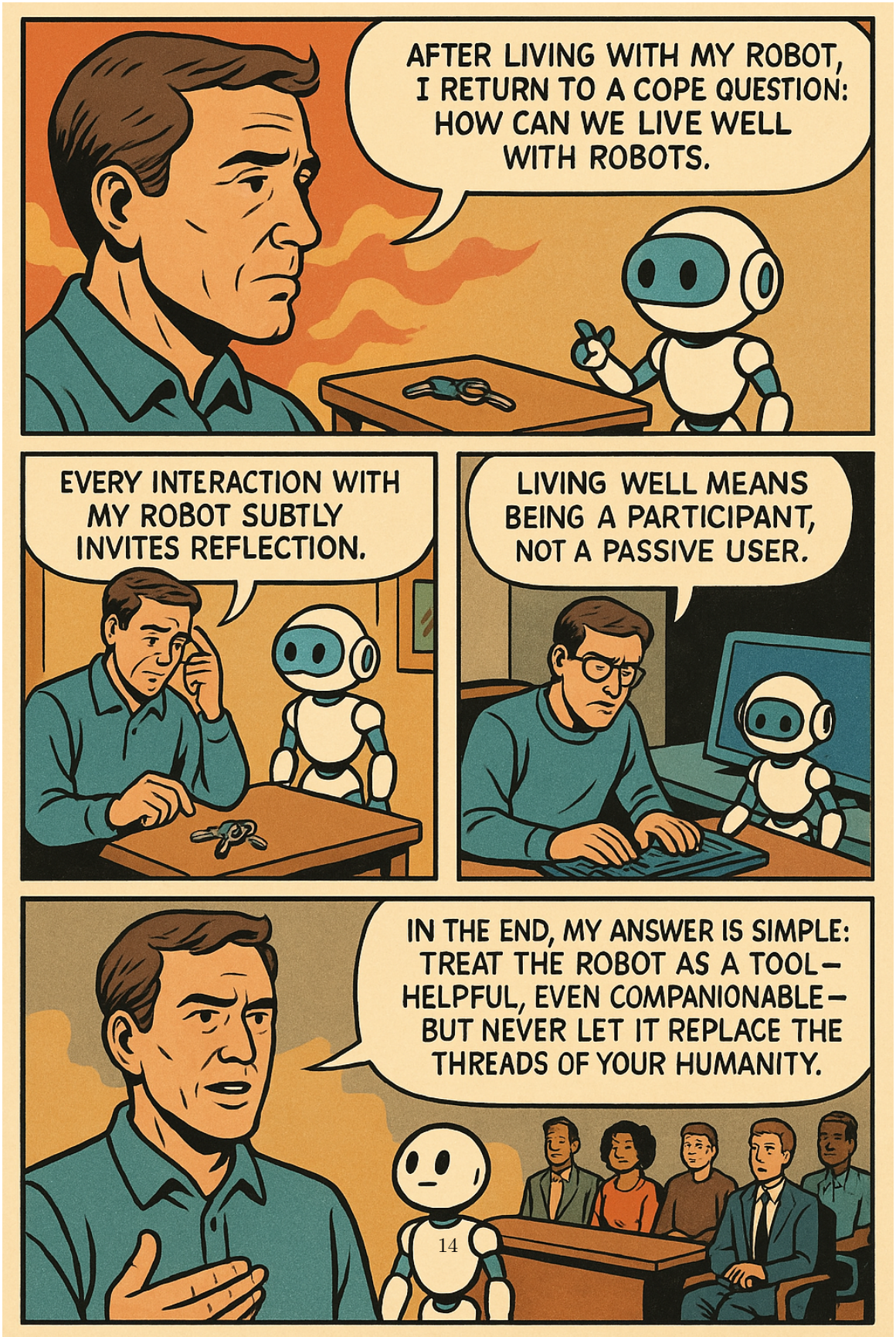

Figure 7: A comic depicting the engineering recommendations for designing a reliable robot for the future[11]