# The Instrument for Outer Reasoning: Cognitive Dependency and Technological Substitution

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## 1. INTRODUCTION

Computational systems increasingly mediate everyday cognitive activity. Thinking is distributed across humans and machines through recommendation engines, reminders, and decision-support tools. This redistribution operates through convenience rather than loss, gradually positioning internal cognitive effort as friction. Actions once requiring deliberation are reframed as problems to be optimised.

The Instrument for Outer Reasoning formalises the logic implicit in contemporary cognitive technologies. Rather than celebrating cognitive distribution, the work models its failure—revealing how extension transitions into substitution. Through a portable device designed to degrade over time, the project translates abstract concerns about automation and dependency into embodied experience.

## 2. THEORETICAL FRAMEWORK AND DESIGN LOGIC

Three frameworks ground the project. Bainbridge's 'Ironies of Automation' (1983) shows how sustained automation erodes human capability—operators become simultaneously essential and least prepared to intervene. Extended Mind Theory (Clark & Chalmers, 1998) argues cognition distributes across tools and environments, yet under-theorises what happens when external systems become more reliable than internal cognition. Narayanan's critique of 'Fake AI' (2023) demonstrates how systems positioned as intelligent train users to defer judgment, migrating responsibility away from human subjects.

The Instrument occupies the theoretical blind spot between these positions. It models a condition where external cognitive systems dominate and internal cognition becomes fragile, maintained only through continuous engagement. Rather than treating outsourced cognition as neutral extension, the project reframes it as restructuring of the human subject itself.

## 3. THE DEVICE: INTERACTION AND DEGRADATION

The device is intentionally unremarkable—a small, laptop-like interface borrowing from medical monitoring aesthetics rather than consumer technology. It operates through five commands: REMEMBER, THINK, CHOOSE, SAY, RECALL. Stability depends entirely on continued interaction. As engagement slows, metrics deteriorate: Attention (ATTN) drops, Memory (MEM) depletes, Error (ERR) spikes, Latency (LAT) increases, External Reliance (EXT) rises.

When internal cognition collapses, the device does not fail. Instead, it silently transitions to complete external operation. Output becomes faster and smoother. The system appears to recover. This masking of loss as functionality is deliberate—the device never presents itself as controlling, only helpful. Authority emerges through calm, clinical tone and the subtle redefinition of sensible behaviour.

By materialising this dynamic through extended interaction, the work asks: What becomes of the human when thinking is maintained externally? At what point does support become substitution? These questions emerge through use, not explicit explanation.

## 4. IMPLICATIONS

The project challenges narratives of cognitive augmentation by positioning dependency as structural outcome, not individual failure. It positions users as responsible for sustaining systems that undermine their own cognition—simultaneously subject, operator, and caregiver. By treating cognition as measurable and managed rather than assumed internal capacity, the work exposes how care, optimisation, and control become entangled.

Grounded in automation theory, extended mind philosophy, and AI critique, the project situates cognitive reliance as plausible outcome of existing trajectories. It does not ask whether such dependency will emerge, but what thinking remains possible once it does.

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